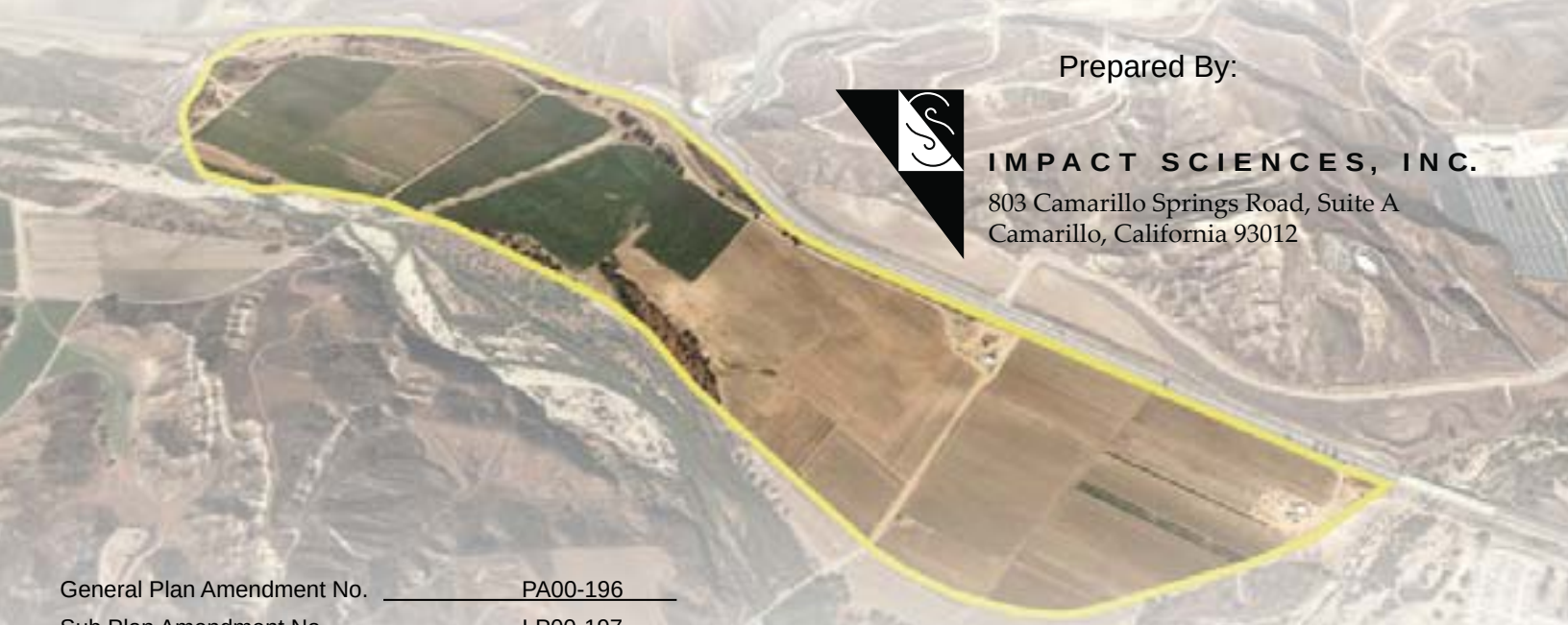
County of Los Angeles

Final Environmental Impact Report

SCH No. 2004021002

Volume I of V

LANDMARK VILLAGE



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Sub Plan Amendment No.	LP00-197
Specific Plan Amendment No.	SP00-198
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NEWHALL RANCH
Newhall Ranch Company

November 2007

FINAL
ENVIRONMENTAL IMPACT REPORT

for
LANDMARK VILLAGE

SCH No. 2004021002

Volume I of V

Prepared for:

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Affordable Housing Program

Appendix G Water Quality
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Waste Discharge Requirements for the Newhall Ranch Sanitation District (Newhall Ranch Water Reclamation Plant), Discharge to the Santa Clara River, Order No. R4-2007-0046, NPDES No. CA0064556

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1.0 INTRODUCTION

In compliance with Section 15132 of the *CEQA Guidelines*, this document serves as the Final EIR for the proposed Landmark Village project, which consists of the following discretionary project approvals: (a) General Plan Amendment PA 00-196, Sub-Plan Amendment LP 00-197, and Specific Plan Amendment SP 00-198; (b) Vesting Tentative Tract Map No. 53108; (c) Significant Ecological Area (SEA) Conditional Use Permit (CUP) RCUP 200500112 for project-level development within the Specific Plan's River Corridor Special Management Area (SMA)/ SEA 23 boundaries; (d) Oak Tree Permit OTP 00196; (e) Off-Site Soil Transport Approval (part of CUP 00196 entitlement request); (f) CUP 00-196 for off-site grading in excess of 100,000 cubic yards and construction of the off-site water tanks; and (g) Modification to adopted County Floodway limits.

As required, this document provides responses to written comments received on the Draft EIR and response to public testimony received at public hearings before the County of Los Angeles Planning Commission on January 31, 2007 and February 28, 2007. The initial public review and comment period for the Draft EIR was from November 20, 2006 to January 22, 2007 (60 days). The public comment period was subsequently extended by the Regional Planning Commission to February 20, 2007. To ensure public access to the Draft EIR, copies of the document were made available for review at three local libraries, as well as the Department of Regional Planning offices. In addition, the Draft EIR was made available on the Department of Regional Planning's website. Section 15132 of the *CEQA Guidelines* requires that the Final EIR consist of the following elements:

(a) The Draft EIR or a revision of the draft.[1]

(b) Comments and recommendations received on the Draft EIR either verbatim or in summary.[2]

(c) A list of persons, organizations, and public agencies commenting on the Draft EIR.

(d) The responses of the Lead Agency to significant environmental points raised in the review and consultation process.

(e) Any other information added by the Lead Agency.

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1 All references to the Draft EIR are to the Draft EIR for the Landmark Village project, SCH No. 2004021002, released for public comment on November 20, 2006 to January 22, 2007 (60 days), and incorporated by reference into the Final EIR (*CEQA Guidelines*, Sections 15132, 15150, and 15362).

2 Ibid.

The Final EIR is organized in the following manner:

- Introduction
- Topical Responses
- Comment Letters and Responses to Comment Letters
- Hearing Testimony and Responses
- Revised Draft EIR Pages
- Appendices to the Final EIR:
  - APPENDIX A – Biological Resources Reports
  - APPENDIX B – Water Resources Reports
  - APPENDIX C – Air Quality Data/Reports
  - APPENDIX D – Fiscal Reports
  - APPENDIX E – Cultural/Paleontological Resources
  - APPENDIX F – Land Use
  - APPENDIX G – Water Quality Data/Reports
  - APPENDIX H – Staff Reports

A list of the persons, organizations, and public agencies commenting on the Draft EIR is presented in the Table of Contents. Comments received, in writing and orally, on the Draft EIR are presented in the sections entitled "Comment Letters" and "Public Hearing Transcripts." The responses of Los Angeles County to environmental issues raised in the review of the Draft EIR are presented in the sections entitled "Topical Responses," "Responses to Comment Letters," and "Hearing Testimony and Responses." A revision of the Draft EIR is presented in the section entitled "Revised Draft EIR Pages." Lastly, "Appendix to the Final EIR" contains documents cited as an appendix to this Final EIR.

2.0 COMMENTS AND RESPONSES TO COMMENTS

A list of those agencies, organizations, and interested parties, which have commented on the Draft EIR, is provided below. A copy of each comment letter or a summary of each comment, and a response to each specific comment, follows this list.

Topical Responses

Topical Response 1: Perchlorate Treatment Update
Topical Response 2: EIS/EIR Project
Topical Response 3: Public Review Opportunities
Topical Response 4: CLWA's 41,000 AFY Water Transfer
Topical Response 5: Litigation Concerning Water Supplies
Topical Response 6: Global Climate Change and Its Effects on California Water Supplies
Topical Response 7: Global Climate Change and Its Effects on Sensitive Biological Resources
Topical Response 8: Greenhouse Gas Emissions and Global Climate Change
Topical Response 9: Groundwater Supplies and "Overdraft" Claims

State Agencies

A1 Department of California Highway Patrol, December 11, 2007
A2 Native American Heritage Commission, December 26, 2007
A3 Governor's Office of Planning and Research, January 4, 2007
A4 California Fish and Game, January 8, 2007
A5 Native American Heritage Commission, January 22, 2007
A6 California Regional Water Quality Control Board, Los Angeles Region, January 22, 2007
A7 Governor's Office of Planning and Research, January 24, 2007
A8 Department of Transportation, January 30, 2007
A9 California Department of Fish and Game, January 29, 2007
A10 Governor's Office of Planning and Research, February 1, 2007
A11 Governor's Office of Planning and Research, February 6, 2007
A12 Governor's Office of Planning and Research, February 7, 2007
A13 California Department of Fish and Game, February 20, 2007
A14 Governor's Office of Planning and Research, February 21, 2007
A15 Governor's Office of Planning and Research, February 26, 2007

County Agencies

B1 County of Ventura, Resource Management Agency, January 19, 2007
B2 Los Angeles County Sanitation Districts, January 22, 2007

Local Agencies and Organizations

C1 Castaic Lake Water Agency, January 16, 2007
C2 Castaic Lake Water Agency, January 22, 2007
C3 Southern California Association of Governments, January 22, 2007
C4 Castaic Union School District, January 22, 2007
C5 City of Santa Clarita, February 5, 2007
C6 United Water Conservation District, February 7, 2007

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C7 Castaic Lake Water Agency, February 20, 2007
C8 Castaic Lake Water Agency, February 20, 2007
C9 United Water Conservation District, February 20, 2007

Private Organizations

D1 California Water Network, December 11, 2006
D2 Santa Clarita Organization for Planning and the Environment (SCOPE), January 3, 2007
D3 Planning and Conservation League, January 5, 2007
D4 Friends of the Santa Clara River, January 6, 2007
D5 Sierra Club, January 8, 2007
D6 TriCounty Watchdogs, January 13, 2007
D7 Piru Neighborhood Council, January 15, 2007
D8 Audubon California, January 19, 2007
D9 TriCounty Watchdogs, January 19, 2007
D10 California Water Network, January 20, 2007-
D11 TriCounty Watchdogs, January 21, 2007
D12 Friends of the Santa Clara River, January 21, 2007
D13 Heal the Bay, January 22, 2007
D14 Santa Monica Pier Aquarium, January 24, 2007
D15 Topanga Association for a Scenic Community, January 30, 2007
D16 Sierra Club, January 30, 2007
D17 Wishtoyo Foundation, January 31, 2007
D18 California Water Network, January 31, 2007
D19 Wild Heritage Planners, January 31, 2007
D20 California Native Plant Society, February 19, 2007
D21 Center for Biological Diversity
D22 California Water Network, February 11, 2007
D23 Friends of the Santa Clara River, February 16, 2007
D24 Santa Clarita Organization for Planning and the Environment (SCOPE), February 16, 2007 (received February 21, 2007)
D25 Planning and Conservation League, February 20, 2007
D26 Planning and Conservation League, February 20, 2007
D27 Lynne Plambeck, Santa Clarita Organization for Planning and the Environment (SCOPE), February 21, 2007
D28 Friends of the Santa Clara River, February 25, 2007
D29 Sespe Institute, February 27, 2007

Individuals

E1 Eric Grant, January 9, 2007
E2 Edward J. Benison, January 11, 2007
E3 Theresa Brady, January 11, 2007
E4 Gaylon Roden, January 11, 2007
E5 Donica Wood, January 11, 2007
E6 John S. Kelley, January 11, 2007
E7 David Morran, January 12, 2006[7]
E8 Kenneth J. Kerner, January 16, 2007

Individuals (continued)

E9 Michael Grenetz, Received January 17, 2007
E10 Heffernan & Boortz, January 19, 2007
E11 Teresa Savaikie, January 21, 2007
E12 Jill Hughes, January 22, 2007
E13 Marina Tidwell, January 24, 2007
E14 Jeanette Vosburg, January 24, 2007
E15 Susan Suntree, January 24, 2007
E16 Margot Eiser, January 25, 2007
E17 Walter and Elvera Deonik, Received January 25, 2007
E18 Celia R. Burnsweig, Received January 25, 2007
E19 Anita Kasower, Received January 25, 2007
E20 Caroline Boyer, January 25, 2007
E21 Mrs. Edward Haas, January 25, 2007
E22 Mary Morales, January 25, 2007
E23 Russell Begle, January 25, 2007
E24 David Slavin, January 25, 2007
E25 Janet Halper, January 25, 2007
E26 Ray Daniels, January 25, 2007
E27 Hammer Weintraub, January 25, 2007
E28 Jeanne Karpenko, January 25, 2007
E29 E. Ziel, January 25, 2007
E30 Ron Peterson, January 25, 2007
E31 Mary Tyler, January 25, 2007
E32 Sharon Doyle, January 25, 2007
E33 Darek Przebieda, January 25, 2007
E34 Ann Bigler, January 25, 2007
E35 Ana Cader, January 25, 2007
E36 Soren Kerk, January 26, 2007
E37 M. Jason Hall, January 27, 2007
E38 Andrew Sutphin, January 27, 2007
E39 Joaquin Dorado, January 28, 2007
E40 Dr. Randy Martin, January 28, 2007
E41 Joanne Nagy, January 28, 2007
E42 Jim Kalember, January 28, 2007
E43 Judy Hopkins, January 28, 20076
E44 Jason Carter, January 29, 2007
E45 Paula Chadbourne, January 29, 2007
E46 Laurel Neiswander, January 29, 2007
E47 Cheryl Kohr, January 29, 2007
E48 Betty L. Sehnour, Received January 29, 2007
E49 Bonnie & Jerry Ramey, Received January 29, 2007
E50 Barry (Illegible), Received January 29, 2007
E51 Andre Lupica, January 29, 2007
E52 Perfecto Uribe, January 29, 2007
E53 Susan DeWinter, January 29, 2007
E54 Monique Huml, January 29, 2007

Individuals (continued)

E55 James Frame, January 29, 2007
E56 James Davis, January 29, 2007
E57 Eric & Eden Sustin, January 29, 2007
E58 Weon Kyeum Kim, January 29, 2007
E59 Melinda Coulter, January 29, 2007
E60 Brian Smith, January 29, 2007
E61 Lisa Burke, January 29, 2007
E62 Jennifer Grossman, January 29, 2007
E63 Arlie Alfaro, January 29, 2007
E64 Leo Smith, January 29, 2007
E65 Lisa Tucker, January 29, 2007
E66 Lauren Lensch, January 29, 2007
E67 Angela Mangilit, January 29, 2007
E68 Adam Laraway, January 29, 2007
E69 Ivan Chandran, January 29, 2007
E70 Guru Kalle, January 29, 2007
E71 Arnold Pilpil, January 29, 2007
E72 Tim Shaner, January 29, 2007
E73 Qiana Staral, January 29, 2007
E74 Mark Fields, January 29, 2007
E75 Jenny Park, January 29, 2007
E76 Jim Elliott, January 29, 2007
E77 Steve Park, January 29, 2007
E78 Brett Durfee, January 29, 2007
E79 Dani Lewis, January 29, 2007
E80 Tony Lewis, January 29, 2007
E81 Steve Williams, January 29, 2007
E82 Mike Lizarraga, January 29, 2007
E83 Edna Dimataga-Fernandez, January 29, 2007
E84 Eric Jenkins, January 29, 2007
E85 Juan Molina, January 29, 2007
E86 Sam Neylan, January 29, 2007
E87 Jaleen Mastroianni, January 29, 2007
E88 Guy Craighead, January 29, 2007
E89 Quang Pham, January 29, 2007
E90 Joanne Hedge, January 30, 2007
E91 Judith McClure, January 30, 2007
E92 Mong Chong, January 30, 2007
E93 Liza Amtmanis, January 30, 2007
E94 Bryan S. Bergstrand, January 30, 2007
E95 Catherine Deme, January 30, 2007
E96 Joan Byrd, January 30, 2007
E97 Kohei Tomita, January 30, 2007
E98 Michael Bridge, January 30, 2007
E99 Judith Fernandez, January 30, 2007
E100 Kelli Garner, January 30, 2007

Individuals (continued)

E101 Larry Wims, January 30, 2007
E102 Dan Suess, January 30, 2007
E103 Greg Gardner, January 30, 2007
E104 April Woodson, January 30, 2007
E105 Diane Abergel, January 30, 2007
E106 Suzanne Borkoski, January 30, 2007
E107 Brian Donovan, January 30, 2007
E108 Stephanie Hardie, January 30, 2007
E109 Elaine Voelker, January 30, 2007
E110 Lloyd Armour, January 30, 2007
E111 Gino Fronti, January 30, 2007
E112 Carrie Steele, January 30, 2007
E113 Sheila Dudman, January 30, 2007
E114 Robert Macasaet, January 30, 2007
E115 Sam Yako, January 30, 2007
E116 Judee Guzman, January 30, 2007
E117 Deborah Donovan, January 30, 2007
E118 Michelle Eckard, January 30, 2007
E110 Lisa Yun, January 30, 2007
E120 Jenni Millan, January 30, 2007
E121 Melinda Vos, January 30, 2007
E122 Ron Smith, January 30, 2007
E123 Larry See, January 30, 2007
E124 Patty Douglas, January 30, 2007
E125 Merian Young, January 30, 2007
E126 Byron Davis, January 30, 2007
E127 Alison Marek, January 30, 2007
E128 Pablo Monterrosa, January 30, 2007
E129 Gregg Herrera, January 30, 2007
E130 Larry T. Moen, January 30, 2007
E131 Mason Abedinzadeh, January 30, 2007
E132 Jennifer Little, January 30, 2007
E133 Marissa DiBlasio, January 30, 2007
E134 Karleen Jones, January 30, 2007
E135 Danielle Rueff, January 30, 2007
E136 Amy Underwood, January 30, 2007
E137 Sandra & Jim Elliott, January 30, 2007
E138 Charles Chung, January 30, 2007
E139 Jennifer Cabrera, January 30, 2007
E140 Jennifer Robinson, January 30, 2007
E141 Kate Wolf, January 31, 2007
E142 C. Chase (Illegible), January 25, 2007
E143 David Magney Environmental Consulting, January 30, 2007
E144 Darri Raskin and Florence Raskin, January 30, 2007
E145 William Pogiter, January 30, 2007
E146 B. Raskin, January 30, 2007

Individuals (continued)

E147 W.A. Coonfield, January 30, 2007
E148 Ed Raskin and family, January 30, 2007
E149 Shirley Galat and multiple signatures (no date)
E150 B. Rowan, January 31, 2007
E151 Abel Ramos, January 31, 2007
E152 Kristyn Gray, January 31, 2007
E153 Jesenia Mendoza, January 31, 2007
E154 Benjamin Ludovico, January 31, 2007
E155 Cristine Monfore, January 31, 2007
E156 Andrea & James Gutman, January 31, 2007
E157 Rod Kaufman, February 1, 2007
E158 Linda Siversten, February 1, 2007
E159 Debbie de Courson, February 1, 2007
E160 Davey Lopez, February 1, 2007
E161 Bryan Good, February 1, 2007
E162 Nancy Winters, February 2, 2007
E163 Celeste Dye, February 5, 2007
E164 James Starkweather, February 5, 2007
E165 Tony Lewis, February 5, 2007
E166 Karen Aguilar, February 5, 2007
E167 Teresa Rutherford, February 5, 2007
E168 Courtney Kang, February 5, 2007
E169 Mary Elisa Cobarruibas, February 5, 2007
E170 Richard F Doctor, February 8, 2007
E171 Dorothy Geisler, February 8, 2007
E172 Carol Lutness, February 8, 2007
E173 Dean Webb, February 8, 2007
E174 Katherine Squires, February 10, 2007
E175 Katherine Squires, February 11, 2007
E176 Dinda Evans January 9, 2007
E177 Barbara Cogswell, February 12, 2007
E178 Willis Simms, February 12, 2007
E179 James Tejani, February 13, 2007
E180 Edward Simpson, February 15, 2007
E181 David King?, February 16, 2007
E182 Dr. Mary Brenneman, February 18, 2007
E183 Barbara Wamploe, February 19, 2007
E184 Geoff Webberley, February 19, 2007
E185 Tracy Scarrino, February 19, 2007
E186 Cody Hitt, February 19, 2007
E187 Dan and Gina Nordenstrom, February 20, 2007
E188 Snowdy Dodson, February 20, 2007
E189 Thomas Barron, February 20, 2007
E190 Celia Lamborn, February 20, 2007
E191 Lech Ross?, February 20, 2007
E192 Janeice McConnell, February 20, 2007

Individuals (continued)

E193 Teresa Savaikie, June 26, 2007
E194 Bette Simons, February 19, 2007
E195 Elizabeth McMahon, February 20, 2007
E196 Gayle Dufour, February 20, 2007
E197 Laurel Neiswander, February 20, 2007
E198 Betty Schnaar, February 20, 2007
E199 Linda Klein, February 20, 2007
E200 Elaine Trogman, February 20, 2007
E201 Alan Pollack, M.D., February 20, 2007
E202 Ken Platner (no date)
E203 Charles Beals, February 20, 2007
E204 Wyndee Haley (no date)
E205 Dan McCroy (no date)
E206 Kathleen Grantham, February 21, 2007
E207 Sylvia Garcia, February 21, 2007
E208 Stephen ?, February 21, 2007
E209 Thomas Barron, February 21, 2007
E210 Alfonso Montilla, February 22, 2007
E211 Thomas Barron, February 27, 2007
E212 Thomas Barron (no date)
E213 Gail and George MacDonald (no date)
E214 Esther and Martin Kaplinsky, January 28, 2007

Late Letters

D30 Center for Contract Compliance, March 6, 2007
D31 Sierra Club, March 14, 2007
D32 San Fernando Valley Audubon Society, March 28, 2007
D33 West Ranch Town Council, April 2, 2007
D34 Sierra Club, April 13, 2007
D35 Sierra Club, May 1, 2007
D36 Friends of the Santa Clara River, July 24, 2007
E215 Paul Ayers, March 9, 2007
E216 Ingeborg Prochazka, March 12, 2007
E217 Brian O'Reilly, March 26, 2007
E218 Carol Winkler, April 2, 2007
E219 Evelyn Carpenter (no date)
E220 Barbara Cogwell (no date)
E221 Carole Lutness, April 1, 2007
E222 Deana Perozzi, April 1, 2007
E223 Frank Ford (no date)
E224 Mary Indermule (no date)
E225 Christine Johann and Stephen Cartotto (no date)
E226 Dr. Mha Atma Khalsa and Martha Oaklander, March 29, 2007

Hearing Testimony and Responses

Regional Planning Commission Transcript, January 31, 2007
Regional Planning Commission Transcript, February 28, 2007

TOPICAL RESPONSE 1: PERCHLORATE TREATMENT UPDATE

A number of comments submitted in response to the Landmark Village Draft EIR relate to the detection of ammonium perchlorate (perchlorate) in the groundwater basin underlying the Santa Clarita Valley, and its effect on the overall reliability of groundwater supplies, as well as delays in implementation of the Santa Clarita Valley water purveyors' perchlorate treatment program. The impacts of perchlorate on the groundwater supply are addressed in the Landmark Village Draft EIR, Section 4.10, Water Service, generally, and specifically at pp. 4.10-63 through 4.10-69. As discussed in Section 4.10, planning for the remediation of perchlorate and restoration of the impacted well capacity is substantially underway. Castaic Lake Water Agency (CLWA), the local retail water purveyors, the Department of Toxic Substances Control (DTSC), and the U.S. Army Corps of Engineers (Corps) continue to monitor and work closely on the remediation of the perchlorate-impacted wells. While the remediation work is being completed, non-impacted wells can be relied upon for the quantities of water projected to be available from the groundwater basin during the time necessary to restore the remaining perchlorate-impacted wells. Additionally, as detailed further in this response, CLWA has reported a recent significant development related to funding of the perchlorate treatment program that will have the effect of eliminating any further delays in the commencement and ultimate operation of the planned perchlorate treatment.

Background

Perchlorate was detected in four Saugus wells operated by purveyors in the eastern part of the Saugus Formation, near the former Whittaker-Bermite site in 1997. This site was formerly used to manufacture rocket fuel and other munitions and has been identified for many years as the source of perchlorate contamination. As a result of the detection, the four Saugus wells (Santa Clarita Water Division's wells Saugus 1 and 2, Newhall County Water District's well NC-11, and Valencia Water Company's well V-157) were removed from service. In 2000, CLWA and the retail water purveyors filed a lawsuit against Whittaker-Bermite contending the site was the source of the perchlorate contamination and seeking cleanup of the groundwater. In 2002, perchlorate was detected in Santa Clarita Water Division's Stadium Well, located in the Alluvial aquifer, directly adjacent to the former Whittaker-Bermite site. This Alluvial well was removed from service as well.

Since that time, CLWA and others have been conducting regular monitoring of active wells near the former Whittaker-Bermite site. In April 2005, that monitoring detected perchlorate in Valencia Water Company's well Q2, a second Alluvial well near the former Whittaker-Bermite site. In response, Valencia Water Company removed well Q2 from active service, commissioned the preparation of an analysis and report assessing the impact of, and response to, the perchlorate contamination of that well, and

subsequently pursued permitting and installation of wellhead treatment in order to return the well to water supply service. In October 2005, Valencia Water Company restored the pumping capacity of well Q2 with the start-up of wellhead ion exchange treatment that effectively removes perchlorate from well Q2. Since October 2005, test results from the untreated water produced by well Q2 have been non-detect (less than 4 parts per billion) for perchlorate. Well Q2 continues to be operated, with wellhead perchlorate treatment under permit from DHS, as part of Valencia's Alluvial groundwater supply. On-going treatment of water from well Q2 is expected to continue until DHS determines that it is no longer needed, in which case the treatment system would then be relocated and integrated with CLWA's perchlorate containment/restoration program.

Valencia Water Company also permanently closed well V-157 and, in the fall of 2005, completed the construction of new Saugus well V-206, located in an area of the Saugus Formation not impacted by perchlorate. Valencia Water Company's well V-206 is permitted, operational, and replaces the pumping capacity temporarily impacted by the detection of perchlorate at former well V-157.

In summary, three Saugus wells (Saugus 1 and 2 and NC-11) and one Alluvial well (SCWD Stadium well) remain off-line due to perchlorate contamination. Perchlorate recently was detected in 2006, in a Saugus well operated by Newhall County Water District (well NC-13), near one of the originally impacted Saugus wells. This detection has not been interpreted as an indication of the continued spread of the perchlorate. This detection was at a "minimal" level (from undetectable to up to 1.9 parts per billion), well below the notification level of 6 parts per billion, and it is located within 1,000 feet of another Saugus well that was capped due to perchlorate contamination since approximately 1997. In addition, the Corps has drilled new monitoring wells and commenced a focused study of the Saugus Formation near this latest detection. Results of this study and any subsequent recommended actions will be incorporated into the overall groundwater remediation and removal actions submitted by Whittaker-Bermite and reviewed by DTSC.

Update of CLWA's Groundwater Treatment Program

CLWA, in conjunction with the local retail water purveyors, is proceeding with a two-prong perchlorate contamination program. The first prong is to protect non-impacted wells by pumping contaminated groundwater near the former Whittaker-Bermite site, thus preventing further migration within the aquifer and recovering costs incurred in responding to the perchlorate contamination. The second prong of the program is to restore the production capacity and water supply from wells that have been temporarily closed due to the detection of perchlorate. As outlined below, CLWA's containment and water supply restoration program is well underway.

CLWA developed an Interim Remedial Action Plan (IRAP) to address the groundwater perchlorate contamination, and that action plan was approved by DTSC in January 2006. A groundbreaking ceremony for construction of the perchlorate treatment system and associated pipelines took place in August 2006. Monitoring wells required for the project have been constructed. The final design for treatment facilities and pipelines was completed in May 2007. The major construction work was put out to bid in July 2007, with contracts for construction of the treatment facilities and pipelines awarded in September 2007. .

A previous "preliminary" estimate for commencing implementation of this program was reported as October 2006; CLWA subsequently revised this date to mid-2007. These dates represented a best estimate at the time they were issued. However, as detailed below, the Whittaker-Bermite litigation has been resolved and funding is now available such that CLWA expects to promptly implement the remediation program. CLWA currently estimates that construction of the perchlorate treatment facilities will begin in September 2007, and that the facilities will commence treatment operations in December 2008. See, CLWA Memorandum, Board of Directors, dated June 1, 2007. A copy of this memorandum, which is incorporated by reference, is found in **Appendix B** of this Final EIR.

Whittaker-Bermite Settlement Agreement

Significantly, the County of Los Angeles has been advised that CLWA and the retail water purveyors recently entered into a settlement agreement in connection with the 2000 lawsuit brought against Whittaker-Bermite whereby CLWA and the purveyors estimate they will receive up to $100 million to construct the necessary perchlorate treatment facilities and pipelines; establish replacement wells as necessary; and, fund the operation and maintenance of these facilities for a period up to 30 years.

Under the terms of the settlement agreement, the current and former owners of the Whittaker-Bermite site and their insurers will provide funding to construct replacement wells for the Stadium well and the NC-11 well, and a treatment plant to remove perchlorate from Saugus wells 1 and 2. Funding also will be provided to pay for the replacement of well V-157 (already undertaken), and the installation of wellhead treatment at well Q2, also already undertaken. The settlement agreement provides funds to operate and maintain the treatment system for up to 30 years, an amount the water agencies estimate could be as much as $50 million.

As noted above, the treatment facilities already have been designed and the settlement agreement provides almost $12 million to reimburse the agencies for past expenditures. In addition, a $10 million "rapid response fund" will be established to allow the water agencies to immediately treat specified wells that could become impacted by perchlorate contamination in the future. Costs not covered in the

settlement agreement, such as the federal government's fair share of monitoring and treatment, will be sought *via* grant funding, including money made available by the Department of Defense.

Because certain defendants had previously filed for bankruptcy protection, the settlement agreement required approval by the U.S. Bankruptcy Court. On June 14, 2007, the Bankruptcy Court granted that approval. Final approval of the settlement agreement also required good-faith settlement determination by the U.S. District Court; that approval was granted on July 13, 2007. The District Court's action constitutes the final required court approval; accordingly, all payments under the settlement agreement were paid in August 2007.[1]

Groundwater Quality near the Landmark Village Site

Specific to the Landmark Village site, the quality of the groundwater available from the Alluvial aquifer near the project site has been tested. The results of laboratory testing conducted for the Valencia Water Company wells that are expected to serve the project site are provided in the Landmark Village Draft EIR, p. 4.10-42. The wells expected to be used are located just northeast of the Newhall Ranch Specific Plan site in the Valencia Commerce Center, and already been approved by the Department of Health Services. Laboratory testing indicates that all constituents tested were at acceptable levels for drinking water under California Code of Regulations, Title 22, Division 4, Chapter 15 (Title 22).

Comments on the Landmark Village Draft EIR claim total dissolved solids (TDS) are exceeded in the Alluvial groundwater to be used to meet potable water demands of Landmark Village. However, the newly-constructed replacement wells permitted by the Department of Health Services (DHS), which will be used to meet Landmark Village potable water demands, replaced older wells used for irrigation that are no longer active, having been permanently closed as directed by DHS. The newly installed wells have been sampled in accordance with the California Safe Drinking Water Act, and the results show compliance with all drinking water standards under Title 22, including compliance with secondary standards for TDS.[2]

Specific to perchlorate, tests conducted for perchlorate indicated "non-detect." Valencia Water Company also investigated the future risk of perchlorate contamination on its new wells. Based on a technical

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1 A copy of the "Castaic Lake Water Agency Litigation Settlement Agreement," and the "Order Granting Joint Motion for Court Approval, Good Faith Settlement Determination and Entry of Consent Order," filed July 13, 2007, which are incorporated by reference, are available for review upon request during regular business hours at the offices of Valencia Water Company, 24631 Avenue Rockefeller, Valencia, California.

2 Results from laboratory testing conducted for Valencia Water Company wells expected to serve Landmark Village already were provided in Appendix 4.10 of the Landmark Village Draft EIR (see, Letter from Valencia Water Company to Impact Sciences, dated March 8, 2006).

report prepared by Luhdorff & Scalmanini (groundwater consultants), it was found that, given that the groundwater resources from the Alluvial aquifer for Landmark Village would be produced from wells located along Castaic Creek and over 4 miles west of the area known to be perchlorate-contaminated (*i.e.*, the former Whittaker-Bermite site), the groundwater supplies for the project are not considered at risk.[3] In any event, there are now established wellhead treatment facilities that effectively remove perchlorate and restore well capacity. Valencia Water Company's well Q2 illustrates the effectiveness of such facilities.

In addition, as stated above, there is now an established fund to allow the Santa Clarita Valley water agencies to immediately treat specified wells that could become impacted by perchlorate in the future. Under the terms of the settlement, this fund can be used on "threatened" wells. For Valencia, they are Alluvial wells S6, S7, S8, N, N7, N8, and Saugus wells 201, 205. The E wells are not considered threatened; however, those wells (and other Valencia wells) are identified as non-impacted wells and if perchlorate is detected at a well that was previously non-impacted, Valencia can take several actions provided for under the settlement agreement (see, Settlement Agreement, Article 10).

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3 A copy of the technical report, *Potential Capture of Perchlorate Contamination, Valencia Water Company's Wells E14 - E17* (April 26, 2006), is included in the Draft Landmark Village EIR, Volume VIII-Appendices, Appendix 4.10.

TOPICAL RESPONSE 2: EIS/EIR PROJECT

Several comments refer to the joint Environmental Impact Statement/Environmental Impact Report (EIS/EIR) process, which is described in the Landmark Village Draft EIR, Vol. I (November 2006), Section 4.4, pp. 4.4-145 through 4.4-146, as one of the related projects analyzed for cumulative impact assessment purposes. The proposed project evaluated in the EIS/EIR is the Landmark Village applicant's Newhall Ranch Resource Management and Development Plan and the Spineflower Conservation Plan (EIS/EIR Project). The lead agencies for the EIS/EIR Project are the U.S. Army Corps of Engineers (Corps) and the California Department of Fish and Game (CDFG).

The comments generally state that Los Angeles County's review of the Landmark Village project and EIR should either be "stayed" or "not proceed" until the EIS/EIR has been released or completed. Other comments request that the EIS/EIR be finalized and a "record of decision" by the Corps be adopted before proceeding any further with the Landmark Village project and EIR. In addition, the comments state that the "sequence" of the Landmark Village EIR and the EIS/EIR is "backwards," meaning that some commentators would like to see the EIS/EIR be completed and adopted before the County proceeds any further with the Landmark Village project and EIR. The County does not concur with these comments or the requested sequence for the reasons explained below. In addition, the County provides, below, additional updated information pertinent to the EIS/EIR Project.

1. The County's Review of the Landmark Village Project and EIR Need Not Await Completion of the EIS/EIR

The County has considered the above comments, and has concluded that the County's review of the Landmark Village project and EIR need not await completion of the EIS/EIR Project. The reasons supporting the County's factual determination are set forth below.

First, the Landmark Village Draft EIR correctly listed the EIS/EIR Project as one of 22 projects with related or cumulative impacts. (Draft EIR, Section 4.4, pp. 4.4-135–147.) Under CEQA, the list of cumulative projects is to include, among others, "probable future projects" producing related or cumulative impacts. (*CEQA Guidelines* §15130(b)(1)(A).) The EIS/EIR Project falls into this category of a "probable future project" under CEQA. No requirement exists for a proposed project, such as Landmark Village, to be stayed or to not proceed, because there is a related "probable future project" under review by different public agencies. Instead, the legal obligation under CEQA is for the Landmark Village EIR to discuss the cumulative impacts of the Landmark Village project, in conjunction with other projects with related impacts. This analysis was completed in the Landmark Village Draft EIR, and it included the EIS/EIR Project. (See, e.g., Draft EIR, Section 4.4, pp. 4.4-135–147.)

In addition, it should be understood that before the applicant sought federal and state permits for portions of the Specific Plan, and before initiating preparation of the Landmark Village project EIR, the County certified programmatic environmental documentation for the entire Specific Plan area.[1] Consistent with *CEQA Guidelines* §15168, the previously certified Newhall Ranch programmatic environmental documentation provided several advantages, including: (a) allowing for a more exhaustive consideration of effects and alternatives for the entire Specific Plan area than would be practical if the review was conducted on a project-by-project basis; (b) ensuring consideration of cumulative impacts that might be slighted or overlooked in a case-by-case analysis; (c) avoiding duplicative reconsideration of basic policy considerations and decisions already made by Los Angeles County; and (d) allowing the County to consider broad policy alternatives and program-wide mitigation measures at an early time in the environmental review process. The *CEQA Guidelines* further acknowledge that later activities, which are part of the program, are required to be examined in light of the prior program documentation. (*CEQA Guidelines* §15168(c).)

Here, the County determined that projects implementing the Specific Plan would undergo additional project-specific environmental review. It also acknowledged that other projects implementing portions of the Specific Plan would undergo even further project-specific environmental review in conjunction with the federal and state permitting process. The previously certified Newhall Ranch "program" documentation serves as the foundation for these subsequent actions and activities. With this program in place, nothing prohibits or precludes concurrent processing at the project implementation level.

Second, the related EIS/EIR Project was initiated as part of the implementation of the Specific Plan. The adopted Specific Plan (May 27, 2003) specifically contemplated that "[m]itigation and management activities within Newhall Ranch will be subject to a variety of future requirements," including CDFG "Section 1603 Streambed Alteration Agreements" and "Section 404 Permits" issued by the Corps. (Specific Plan, Section 2.6, p. 2-85.) The Specific Plan also contemplated that its implementation would be "carried out through the application and processing of standard County entitlement procedures, including subdivision maps," and other additional land use approvals. (Specific Plan, Section 5, p. 5-1.) The Landmark Village project, which includes a proposed subdivision map, is also part of the implementation of the adopted Specific Plan. Importantly, nothing in the County's Specific Plan implementation procedures requires the subdivision map process to be stayed or otherwise await completion of the

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1 See, Revised Draft Program EIR for the Newhall Ranch Specific Plan and Water Reclamation Plan (March 8, 1999), and the Newhall Ranch Revised Additional Analysis, Volume VIII (May 2003), SCH No. 1995011015. This previously certified Newhall Ranch environmental documentation has been incorporated by reference in the Landmark Village EIR and record, and is available for public inspection and review at Los Angeles County Department of Regional Planning, 320 West Temple Street, Los Angeles, California 90012.

federal/state permitting process now underway in connection with the EIS/EIR Project. Specific Plan, Section 5, pp. 5-1–35.)

Third, some comments suggest that the Landmark Village project should not proceed until the EIS/EIR Project is completed, because impacts, mitigation, or alternatives identified in the federal and state permit process for the EIS/EIR Project may affect the Landmark Village project and possibly require design changes or revisions. However, the County considers these comments not as a basis for staying or deferring the Landmark Village project, but rather as a description of the further environmental review process, which was contemplated when the Specific Plan was adopted. Stated differently, the County anticipates additional mitigation and possible design changes for the Landmark Village project as a customary part of the on-going project-specific planning and environmental review process. The County anticipates that, if the Landmark Village project is approved, federal and state agencies may subsequently impose additional mitigation measures, which could result in design changes to the Specific Plan, including the Landmark Village project area; however, such actions are part of the expected federal and state permitting process. Nothing precludes the two processes (local and federal/state) from proceeding concurrently. And, nothing precludes the local project-specific process from going "ahead" of the federal/state permitting process. In fact, the processing of project approvals in phases from the general planning level to more specific construction proposals is neither new nor unique for complex, phased projects that are anticipated to be constructed over a period of several years.

Finally, the County understands that the Landmark Village applicant is working with federal and state agencies, sharing project-specific data, and coordinating regularly on various Specific Plan-related planning and environmental issues, including the Landmark Village project. This coordination is a customary part of a long-term phased project, like the Specific Plan. This on-going coordination effort is expected to continue while the Landmark Village project proceeds from Planning Commission to the Board of Supervisors. The County sees no reason to alter this on-going process. Indeed, the County prefers that these "sequencing" issues be left to the project applicant, and does not wish to regulate the manner in which an applicant desires to implement an approved plan, like the adopted Newhall Ranch Specific Plan. In addition, as part of the future processing of permits required to implement the Specific Plan (e.g., Corps 404 permit, CDFG Streambed Alteration Agreement, etc.), the County expects appropriate federal and state agencies to continue to be consulted and as additional conditions or mitigation measures are identified, they will become part of the mechanisms implementing the overall program (i.e., Newhall Ranch Specific Plan).

2. EIS/EIR Project Update

As stated in the Landmark Village Draft EIR, the applicant is currently processing federal and state permit applications and the preparation of a joint EIS/EIR under both the National Environmental Policy Act (NEPA) and CEQA to assess the environmental implications of implementing the proposed Newhall Ranch Resource Management and Development Plan (RMDP) and Spineflower Conservation Plan (SCP). (Landmark Village Draft EIR, Section 4.4, pp. 4.4-145–146.) Since public circulation of the Landmark Village Draft EIR, additional information can be provided as an update to the EIS/EIR Project and associated environmental document. This update is provided below.

The Corps and CDFG are the joint lead agencies responsible for this proposed EIS/EIR Project and associated environmental documents. The EIS/EIR Project applicant and landowner is The Newhall Land and Farming Company (Newhall Land or applicant). The applicant is requesting federal and state permits, agreements, and authorizations from the Corps, CDFG, and other agencies to implement the proposed EIS/EIR Project.

The proposed EIS/EIR Project consists of two components. The first is the proposed RMDP, which is a conservation and mitigation plan for sensitive biological resources within the previously approved Newhall Ranch Specific Plan area, and it would be relied upon to obtain federal and state permits to implement infrastructure improvements required for build-out of the approved Specific Plan. The second component is the SCP, which is a conservation and management plan to permanently protect and manage a system of preserves designed to maximize the long-term persistence of the San Fernando Valley spineflower (*Chorizanthe parryi* ssp. *fernandina*; spineflower or SFVS), a federal candidate and a state-listed endangered plant species. The SCP would address known spineflower located within the Specific Plan area and two study areas, the Valencia Commerce Center (VCC) and portions of Entrada.

Resource Management Development Plan Component

As stated, the RMDP component is a conservation, mitigation, and permitting plan for the long-term management of sensitive biological resources in conjunction with infrastructure improvements within the 11,963-acre Specific Plan area. The Specific Plan was approved by Los Angeles County in May 2003 to guide development of a new community composed of a broad range of residential, mixed-use, and non-residential land uses within villages on the Specific Plan site. Subsequent development plans, subdivision maps, and federal and state permitting, consultations, and agreements were anticipated to be required to facilitate build-out of the Specific Plan.

The resource management portion of the RMDP would guide future resource conservation, mitigation, and permitting needed for the long-term management of sensitive biological resources within the Specific

Plan. The development plan portion of the RMDP consists of physical infrastructure improvements located in or adjacent to the Santa Clara River and its tributaries that are required to facilitate the approved Specific Plan.

The RMDP infrastructure improvements are comprised of various flood control features, stream bank protection, recreated and enhanced channels, drainage facilities, roads, pipeline and utility river crossings, nature trails, new and widened bridges, the discharge outfall for the previously approved Newhall Ranch Water Reclamation Plant (WRP), and drainage facility maintenance activities by the Los Angeles County Department of Public Works (LACDPW) or other appropriate agencies. The proposed infrastructure improvements and maintenance activities require federal and state permits, consultations, and agreements from the Corps, the U.S. Fish and Wildlife Service (USFWS), CDFG, and other agencies. The proposed improvements and activities require such permitting because they would affect waters, riverbeds, or banks within the jurisdictional limits of the Corps and CDFG, or would potentially affect listed or threatened species, thereby requiring USFWS and/or CDFG approvals. The RMDP also would include various measures necessary under CEQA to mitigate to the extent feasible significant environmental impacts resulting from the proposed Project, including impacts that fall within CDFG's charge as a trustee agency for fish and wildlife resources in California.

The RMDP is intended to build on the Resource Management Plan found in Section 2.6 of the approved Specific Plan, consistent with federal and state law requirements. The Resource Management Plan was originally approved by the County Board of Supervisors on May 27, 2003, as part of the Board's adoption of the Specific Plan. The adopted Resource Management Plan set forth mitigation and management standards for sensitive biological resources located within the boundary of the approved Specific Plan. It also established standards governing public access, recreational use, management, and ownership of the Newhall Ranch River Corridor Special Management Area (River Corridor SMA), the High Country Special Management Area (High County SMA), and the designated Open Areas within the Specific Plan area. The River Corridor SMA and the High Country SMA retain their local Los Angeles County-designation as Significant Ecological Areas (SEAs) under the approved Specific Plan. The River Corridor SMA is still designated as SEA 23, and the High Country SMA remains designated as SEA 20.

In addition, the previously approved Resource Management Plan created opportunities to establish "mitigation banks" within the Specific Plan boundary, provided guidance on the manner in which transitions between development areas and the SMAs and Open Areas would be managed, including the provision for wildfire fuel modification zones, and established a special study mitigation overlay and preserve program for the spineflower.

The Resource Management Plan was prepared at a programmatic level of detail, acknowledging that conservation, mitigation, and permitting activities within the Specific Plan would be subject to future federal and state permits, consultations, and agreements with the Corps, USFWS, CDFG and other agencies. Therefore, the Resource Management Plan was the initial framework for resource management within the Specific Plan area; it was intended to be supplemented through more detailed future plans, permits, and agreements required by federal and state law.

The RMDP would guide future resource conservation, mitigation, and permitting for the long-term management of sensitive biological resources in conjunction with the proposed infrastructure improvements and facilities required to implement the approved Specific Plan. As such, the RMDP is one of the Project components under review by the Corps and CDFG in the joint EIS/EIR. As of this writing, a draft of the RMDP is not yet completed.

Spineflower Conservation Plan Component

As stated, the second component is the SCP, which is a conservation and management plan to permanently protect and manage a system of preserves designed to maximize the long-term persistence of the spineflower. The SCP encompasses the Specific Plan area, the VCC planning area, and portions of the Entrada planning area, in order to conduct comprehensive conservation planning and preserve design on all of the applicant's land holdings in Los Angeles County that contain known spineflower populations. The SCP describes a preserve system proposed by the applicant. The management and monitoring components of the SCP have been developed in consultation with CDFG.

The applicant intends to rely on the SCP to obtain federal and state permits, agreements, and authorizations from USFWS and CDFG to protect and manage spineflower preserves, and authorize take of spineflower in areas located outside of the designated preserve system. The SCP, if approved, would facilitate development within the Specific Plan, the VCC planning area, and portions of the Entrada planning area. The Draft SCP (June 2007) is found in **Appendix A** of this Final EIR.

Summary of the Federal and State Regulatory Framework and Permitting Process

This section summarizes the federal and state regulatory framework and permitting process for the EIS/EIR Project.

The federal action requested from the Corps consists of the issuance of a long-term, individual Section 404 permit for the RMDP facilities and infrastructure associated with the Specific Plan that would potentially result in discharge of fill or dredged material in and adjacent to the Santa Clara River and its tributaries, which are considered "waters" of the United States pursuant to the Clean Water Act (33 U.S.C. §§1251–1387). Prior to permit effectiveness, the applicant also would be required to obtain a water

quality certification under Section 401 of the Clean Water Act from the Los Angeles Regional Water Quality Control Board (RWQCB). As part of the federal permit review process, the Corps must comply with Section 7 of the Endangered Species Act (ESA), which requires an endangered species consultation with the USFWS and the National Oceanic and Atmospheric Administration Fisheries for any permit that may affect an ESA-listed species. Formal consultation between the Corps and USFWS has been initiated and will be completed prior to issuance of a Record of Decision for the Section 404 permit application.

The other federal action to be analyzed in the EIS/EIR is the applicant's request to enter into a Candidate Conservation Agreement with USFWS, consistent with the Endangered Species Act, in order to memorialize agreed upon spineflower conservation, management, and monitoring measures (conservation measures) set forth in both the Agreement and the SCP. The Candidate Conservation Agreement is intended to benefit the spineflower, a federal candidate species, by obtaining the applicant's commitment to implement specified conservation measures, which, when combined with benefits that would be achieved by conservation of the spineflower in Ventura County, would preclude the need to list the spineflower at the federal level. The proposed draft Candidate Conservation Agreement is found in **Appendix A** of this Final EIR.

The state actions requested from CDFG related to the RMDP and SCP consist of the issuance of a long-term Master Lake/Streambed Alteration Agreement and authorization for "take" of species incidental to the otherwise lawful implementation of the Specific Plan, consistent with the California Endangered Species Act (CESA). CDFG would issue the Master Lake/Streambed Alteration Agreement and Incidental Take Permit to Newhall Land pursuant to California Fish and Game Code sections 1605 and 2081(b), respectively.

CDFG would issue the Master Lake/Streambed Alteration Agreement based on the RMDP infrastructure improvements needed to implement the Specific Plan that may substantially divert or obstruct the natural flow of, or substantially change or use any material from the bed, channel, or bank of any river, stream, or lake and where such activities may substantially adversely affect an existing fish or wildlife resource. Likewise, CDFG would issue an Incidental Take Permit for activities in the RMDP and SCP areas that would result in the take of species under CESA. In general, the take authorization would cover activities associated with implementation of the RMDP and SCP components of the proposed Project. Pursuant to CEQA, CDFG may treat certain species affected by the proposed Project that are not currently protected by CESA as endangered, rare, or threatened (14 CCR §15380) and extend the take authorization, as appropriate, for Project-related incidental take of such species. As to possible approval of the RMDP and SCP, and issuance of the Master Lake/Streambed Alteration Agreement and Incidental Take Permit, CDFG would ensure under CEQA that all significant environmental impacts that may result from approval of the proposed Project are fully mitigated to the extent feasible.

The EIS/EIR Project also contemplates the need for authorizations from the RWQCB, including: (a) Section 401 certification of the Corps' Section 404 Permit (or Waste Discharge Requirements (WDRs) issued *in lieu* of certification), which would certify that the Section 404 Permit will comply with state water quality requirements; (b) a dewatering permit (or use of the general dewatering permit) for construction dewatering needs; (c) National Pollutant Discharge Elimination System (NPDES) stormwater permit for runoff resulting from construction and post-development project conditions; and (d) Specific Plan Subregional Stormwater Mitigation Plan, which sets forth the urban runoff management program that would be implemented within the Specific Plan area.

The draft EIS/EIR is expected to be released for public review in late 2007; however, there is no firm release date at this time.

TOPICAL RESPONSE 3: PUBLIC REVIEW OPPORTUNITIES

Several comments request that the public comment period on the Landmark Village Draft EIR be extended to allow additional time to review the document. Some comments request a specific extension of time from an additional 30 to 60 to 120 days. Other comments request an extension of time to complete public review, but do not specify a particular period of time. This response addresses all comments requesting additional public review opportunities with respect to the Draft EIR. In addition, the response provides important background information concerning the County's efforts to provide notice and community outreach associated with both the Newhall Ranch Specific Plan process and the Landmark Village project and associated EIR. As discussed below, the County has provided numerous opportunities for agency and public comment, input, and suggestions during a lengthy open and public planning and environmental review process. All such comments were part of the record before the County's Board of Supervisors when approving the Specific Plan in May 2003. In addition, all comments from the more recent Landmark Village planning and environmental review process will be included as part of the record and made available to the decision makers prior to a final decision on the proposed Landmark Village project.

Newhall Ranch Specific Plan Planning and Environmental Review Process

By way of background, the Landmark Village project site is within the approved boundary of the previously approved Newhall Ranch Specific Plan. The Specific Plan was approved by the County's Board of Supervisors on May 27, 2003. The Newhall Ranch planning and environmental review process began in 1994 and concluded in 2003 – a nine-year process. During that timeframe, the County's Regional Planning Commission held nine noticed public hearings from 1996 through 1999, and five additional noticed public hearings in 2001, for a total of 14 public hearings. The Board of Supervisors also held four noticed public hearings in 1998 and 1999, and two such hearings in 2003, for a total of six hearings. At each of these hearings, the County received and considered testimony for and against the Specific Plan. In summary, a total of 20 noticed public hearings were held during the Specific Plan environmental review process.

During that time, the County also provided exhaustive opportunities to submit agency and public comments on the environmental issues arising from approval of the Specific Plan. Several of the comments received in response to the Specific Plan are presented again in response to the Landmark Village project (e.g., width of buffer from river, adequacy of water supplies including relying upon the

41,000-acre-foot water transfer,[1] floodplain development, bridges, bank stabilization, etc.). However, the Board of Supervisors already considered such comments when it made the decision to approve long-term development via the approval of the Specific Plan. Nonetheless, such comments will be considered, again, in context of the Landmark Village project and associated project-level EIR.

Landmark Village
Planning and Environmental Review Process

On January 30, 2004, County staff prepared and distributed a Notice of Preparation (NOP) of a draft EIR for the Landmark Village project. The NOP requested agency responses as to the scope and content of the environmental information pertinent to each agency's statutory role and responsibilities. The review period for the NOP was from January 30 to March 1, 2004. Copies of the NOP were available for review at three local libraries, as well as the Department of Regional Planning's website. The NOP also provided notice of a public scoping meeting to present information regarding the proposed Landmark Village project, and to solicit public and agency comments and suggestions on the scope and content of the Landmark Village draft EIR. The public scoping meeting was held on Thursday, February 12, 2004, from 6:30 PM to 9:00 PM, at the Castaic Union School District office in Valencia, California. From August 1, 2005 through January 9, 2006, the project applicant also participated in five meetings with the County's Significant Ecological Area Technical Advisory Committee (SEATAC) concerning the Landmark Village project's biota report, including revisions made to that report.

Thereafter, on or about November 20, 2006, notice was distributed of the completion and availability of the Landmark Village Draft EIR. The initial public review and comment period for the Draft EIR was from November 20, 2006 to January 22, 2007 (60 days). This was subsequently extended by the Regional Planning Commission to February 20, 2007. To ensure public access to the Draft EIR, copies of the document were made available for review at three local libraries, as well as the Department of Regional Planning offices. In addition, the Draft EIR was made available on the Department of Regional Planning's website.

In addition, there have been two public hearings before the County's Regional Planning Commission concerning the Landmark Village project and associated EIR. The public hearings took place on January 31 and February 28, 2007. Notices of public hearing were mailed to property owners within a 1,000-foot radius of the Landmark Village property. Additional notices of the public hearings were sent to those on a courtesy mailing list for projects in the Newhall and Castaic Canyon Zoned Districts. Public hearing notices also were published in two local newspapers, and large public hearing notices were

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1 As stated, the Newhall Ranch Specific Plan does not rely on SWP supplies.

posted on the subject property along State Route 126. At the two public hearings, all interested persons were given an opportunity to testify concerning the Landmark Village Draft EIR. The project applicant has also met with several entities and organizations to solicit input on the Landmark Village project and associated EIR. Oftentimes, the meetings included site visits or tours of the project site. For example, the applicant provided several informational presentations to the City of Santa Clarita. The applicant also met with the Audubon Society on October 25, 2006, May 8, 30, and July 30, 2007. In addition, on January 4, 2007, the applicant met with the United Water Conservation District in Ventura County, and, on January 9, 2007, met with representatives of the City of Fillmore in Ventura County. A further meeting took place between the applicant and the County of Ventura on January 16, 2007. The applicant also met with representatives of Friends of the Santa Clara River on December 11, 2006 and January 18, 2007. Presentations also were made to the Castaic Area Town Council on April 18, May 16, and July 18, 2007.

As noted above, several comments received to date requested additional time to review the Landmark Village Draft EIR. In response, County staff recommended, and the Regional Planning Commission granted, a continuance of the public comment period on the Draft EIR to February 20, 2007, providing a 92-day comment period on the Draft EIR.

At the Regional Planning Commission's last public hearing (February 28, 2007), the Commission closed the public hearing and directed staff to return with a final EIR and other information, and to notify interested parties of the next scheduled Regional Planning Commission meeting on the project. If the Regional Planning Commission recommends certification of the Final EIR and approval of the Landmark Village project, the matter will be referred to the County's Board of Supervisors for one or more additional noticed public hearings. Further opportunities will be made available for agency and public comments on the Final EIR to the Board of Supervisors prior to the final hearing.

TOPICAL RESPONSE 4: CLWA'S 41,000 AFY WATER TRANSFER

Comments have been submitted on the Landmark Village Draft EIR claiming that the EIR should not include or rely on the transfer in 1999 to Castaic Lake Water Agency (CLWA) of 41,000 acre-feet per year (afy) of State Water Project (SWP) Table A water supplies (41,000 afy water transfer). The comments state that the EIR should not include or rely on CLWA's 41,000 afy water transfer because it is not final and is the subject of litigation. In addition, comments state that the 41,000 afy water transfer is "further compromised" by recent court decisions concerning regional water supplies. It is asserted that these litigation challenges create uncertainty regarding the availability and reliability of water supplies for the Santa Clarita Valley.

In response to all comments concerning CLWA's 41,000 afy water transfer, it should be emphasized that the Landmark Village Draft EIR, at pp. 4.10-3 through 4.10-4, makes clear that the Landmark Village project does not rely on CLWA's SWP supplies, including the 41,000 afy water transfer. Instead, as stated in the Draft EIR, Landmark Village will use local groundwater and recycled water from local water reclamation plants to meet the project's potable and non-potable water demand. (Id., p. 4.10-3.)

Although Landmark Village does not rely on SWP supplies, the Draft EIR provided an extensive assessment of CLWA's imported SWP supplies for information purposes.

Based on that assessment, and for the reasons discussed below, the County has made the following factual determinations: (a) the Landmark Village project does not rely on SWP supplies; instead, the project will use local groundwater and recycled water from local water reclamation plants to meet the project's potable and non-potable water demands; and (b) it is appropriate for the Santa Clarita Valley to rely, in part, on CLWA's SWP water supplies, including the 41,000 afy water transfer, despite the litigation and other uncertainties that are disclosed in the Landmark Village Draft EIR, pp. 4.10-44 through 4.10-57, and in this response below.

SWP Overview

As stated in the Landmark Village Draft EIR, Landmark Village does not rely on SWP supplies. Instead, Landmark Village will use local groundwater and recycled water from local water reclamation plants to meet the project's potable and non-potable water demand. Nonetheless, for information purposes, the Landmark Village Draft EIR, at pp. 4.10-44 through 4.10-49, provided an overview of the SWP. The overview provided below further elaborates on the SWP, CLWA's 41,000 afy water acquisition, and associated issues.

From 1951 through 1959, the California Legislature authorized and funded construction of the SWP facilities, which are managed and operated by the California Department of Water Resources (DWR). SWP water supplies are used for both urban and agricultural uses throughout California.[1] The SWP facilities consist of a complex system of dams, reservoirs, power plants, pumping plants, canals and aqueducts to deliver water throughout California.

At the inception of the SWP, DWR entered into individual water supply contracts with agricultural and urban water suppliers (SWP contractors). The contracts were the method used to fund construction and operation of the SWP facilities for the delivery of water to the SWP contractors. Each such contract sets forth the annual amount of water to which a SWP contractor is contractually entitled, which is stated in "Table A" to the contract (Table A Amount or allocation). However, the amount of SWP water actually available for delivery in any year may be an amount less than the contractor's maximum Table A amount due to hydrology, operational constraints, environmental constraints, and a number of other factors. The Table A Amount was previously referred to as "SWP entitlement."[2]

There are currently 29 SWP contractors that have entered into water supply contracts with DWR. A SWP contractor may annually request that DWR deliver water in the following year in any amount up to the SWP contractor's Table A Amount. The SWP contracts provide that in a year when DWR is unable to deliver the full amount of contractor requests, deliveries to contractors are reduced so that total deliveries equal total available supply for that year. CLWA's annual contractual Table A Amount is 95,200 afy. In the fall of each year, CLWA, along with all the other SWP contractors, submits a request to DWR for an allocation for the following year. DWR utilizes the factors noted above to "allocate" water among all contractors who have made requests, so that each contractor receives a percentage of its Table A Amount. For example, if the SWP allocation is 40 percent of the Table A Amounts, each contractor could receive 40 percent of its Table A Amount. If the allocation is 100 percent (as in 2006), each SWP contractor could receive the entire contractual Table A Amount.

The 41,000 afy water transfer amount is not kept "separate" as some have suggested. Since 2000, DWR has included the 41,000 afy in the Table A Amount that is allocated in all allocations made to CLWA (based on its total annual allocation of 95,200 acre-feet). DWR has *delivered* and the CLWA service area

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1 Urban water uses also are referred to as "municipal and industrial," or "M&I," uses.

2 As stated by the Court of Appeal in *Santa Clarita Organization for Planning the Environment v. County of Los Angeles* (2003) 106 Cal.App.4th 715, SWP Table A "entitlements" are not equivalent to actual deliveries of water because the amount of SWP water actually available for delivery in any given year may be an amount *less* than the Table A Amount. For example, the amount of SWP water actually available for delivery in any given year *may be reduced due to several factors*, including drought periods, increased SWP operational constraints, environmental water requirements/constraints (e.g., the listing of several fish species as endangered or threatened or the protection of listed fish species due to pumping, etc.), water quality concerns, and other factors.

has *received* water supply, including a percentage of the 41,000 afy, since calendar year 2000. While SWP contractors that receive water from the Delta currently hold Table A Amounts totaling approximately 4.13 million afy, the amount of Table A water actually delivered by the SWP may be less in some years due to hydrology, and operational and environmental constraints. However, by way of example, in 2006, given existing SWP facilities, hydrology, operational and environmental conditions, and SWP contractor demands, the SWP was available to meet 100 percent of the SWP contractors' Table A requests this year.[3] This 100 percent allocation of the Table A Amount to SWP contractors would add up to 4.13 million afy, distributed among the SWP contractors.[4] In sharp contrast, in 2007, DWR announced that its final 2007 water allocation to the SWP Contractors would be reduced to 60 percent.[5] DWR also advised SWP Contractors to begin implementation of any additional water conservation measures available to them because, for 2007, the Sacramento region is listed as a "dry" water year, and the San Joaquin region is listed as a "critically dry" water year. (Id.) Because of these conditions, DWR further advised that water allocations for 2008 could be low if a below average water year materializes. (Id.)

For further illustration, in 2003, DWR approved deliveries of Table A Amount allocations, totaling 3.71 million acre-feet (or 90% of the 4.13 million acre-foot Table A Amount).[6] In 2002, DWR approved deliveries of Table A Amounts, totaling 2.89 million acre-feet (70%).[7] In 2001, DWR approved deliveries of Table A Amounts, totaling 1.61 million acre-feet (39%),[8] and in 2000, DWR approved deliveries of Table A Amounts, totaling 3.42 million acre-feet (90%).[9] Thus, as shown, this available supply can vary significantly from year-to-year.

CLWA's 41,000 AFY Water Transfer Acquisition

In 1999, CLWA purchased 41,000 afy of SWP Table A Amount from Kern County Water Agency (KCWA), acting on behalf of its member district, Wheeler Ridge-Maricopa Water Storage District. This

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3 See, DWR "News for Immediate Release," dated April 18, 2006, which is found in **Appendix B** of this Final EIR.

4 The original long-term water supply contracts between DWR and the SWP contractors assumed maximum annual Table A water deliveries of 4.23 million afy, assuming full development of the SWP. Currently, the maximum Table A Amounts for the SWP contractors that receive their supply from the Delta total approximately 4.13 million afy. (See, Landmark Village Draft EIR, Appendix 4.10 [SWP Delivery Reliability Report 2005, April 2007]).

5 See, DWR Notice to SWP Contractors, dated May 23, 2007, which is found in **Appendix B** of this Final EIR.

6 See, DWR Bulletin 132-04, Management of the California State Water Project, September 2005, excerpts of which are provided in **Appendix B** of this Final EIR.

7 See, DWR Bulletin 132-03, December 2004 (**Appendix B** of this Final EIR).

8 See, DWR Bulletin 132-02, January 2004 (**Appendix B** of this Final EIR).

9 See, DWR Bulletin 132-01, December 2002 (**Appendix B** of this Final EIR).

purchase brought CLWA's total annual SWP Table A Amount to 95,200 afy; that purchase is generally referred to as the 41,000 afy water transfer.

The 41,000 afy water transfer was memorialized in a DWR/CLWA water supply contract amendment (Amendment No. 18), which reflects the *increase* in CLWA's annual allocation of SWP Table A Amounts from 54,200 afy to 95,200 afy. This increase reflects the permanent allocation of the 41,000 afy to CLWA (95,200 - 54,200 = 41,000).[10] As reported in the Landmark Village Draft EIR, the 41,000 afy water transfer has been completed, CLWA paid approximately $47 million for the additional Table A Amount, the monies have been delivered, the sales price has been financed through CLWA by tax-exempt bonds, and DWR increased CLWA's SWP Table A allocation, starting in calendar year 2000, because it was a permanent transfer/reallocation of SWP Table A water between SWP contractors.

Some comments have suggested that CLWA's 41,000 afy water transfer has not been approved by DWR. This is not correct. The 41,000 afy water transfer was approved by DWR on March 31, 1999, in the fully-executed amendment to CLWA's water supply contract (Amendment No. 18). Other comments have asserted that the 41,000 afy water transfer was not a "permanent" transfer of SWP Table A water. This also is incorrect. As stated by DWR in Bulletin 132-00, dated December 2001, at page 94, Amendment No. 18 "provided for the *permanent* transfer of 41,000 afy of SWP agricultural entitlement by CLWA from KCWA, . . . The transfer is consistent with implementation of the Monterey Amendment, which provides for the *permanent* transfer of up to 130,000 afy of agricultural entitlement to urban agencies." (italics added.) Importantly, since 2000, DWR has included the 41,000 afy in all allocations made to CLWA, based on CLWA's total annual Table A allocation of 95,200 acre-feet.[11]

To further support the fact that CLWA's 41,000 afy water transfer was a "permanent" transfer/reallocation of SWP Table A Amount from one SWP contractor to another, in Bulletin 132-04 (September 2005), at page 120, DWR identified all eight Table A transfers, including the 41,000 afy water transfer, as "permanent" transfers under the Monterey Amendments. Furthermore, DWR has confirmed that the parties to the Monterey Settlement Agreement "recognize that the Kern-Castaic Lake Water Agency 41,000 afy Table A transfer is subject to pending litigation and agree that jurisdiction with respect to that litigation remain[s] in the Los Angeles County Superior Court and that nothing in the [Monterey

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10 A copy of "Amendment No. 18 to the Water Supply Contract between the State of California, Department of Water Resources and Castaic Lake Water Agency," dated March 31, 1999, is presented in Appendix 4.10 of the Landmark Village Draft EIR.

11 Please see **Appendix B** of this Final EIR for DWR's "Notices to State Water Project Contractors" informing them of increases or decreases in approved Table A Amounts from 2000 to 2006. In the 2006 Notice, CLWA's Table A allocation is shown as 95,200 afy, and in all of the prior Notices, CLWA's Table A allocation is shown in two places, once under the "San Joaquin Valley" heading, which shows the allocation at 12,700 afy, and again under the "Southern California" heading, which shows the allocation at 82,500 afy, totaling 95,200 afy.

Settlement Agreement] is intended to predispose the remedies or other actions that may occur in the pending litigation." In that same Bulletin, at page 120, DWR has also pointed out that the potential environmental effects of all eight "permanent Table A transfers" under the Monterey Amendments, including the 41,000 afy water transfer, will be analyzed in DWR's new Monterey EIR.[12] (The Monterey Amendments and related Monterey Settlement Agreement are discussed in further detail below.)

Monterey Amendments

In 1994, disputes arose among DWR and many agricultural and urban SWP contractors regarding the availability and distribution of water through SWP facilities. To avoid potential litigation, those parties met in Monterey, California, to attempt to resolve their ongoing disputes and, after negotiations, they agreed to a statement of principles, which became known as the "Monterey Agreement." The Monterey Agreement, signed by DWR and many of the agricultural and urban SWP contractors, established principles to be incorporated into contract amendments (the "Monterey Amendments"), which were primarily intended to increase the reliability of all SWP water supplies, stabilize SWP's rate structure, and increase water management flexibility for all SWP contractors. To date, all but two SWP contractors have accepted the Monterey Amendments. The Monterey Amendments included, among other benefits, water transfers among SWP contractors. Specifically, under the Monterey Amendments, SWP contractors may transfer unneeded Table A water to other contractors on a permanent basis, which provides financial relief from SWP charges for the seller and additional water supplies for the buyer. The Monterey Amendments have facilitated the transfer of 130,000 afy of SWP Table A Amounts from agricultural to urban SWP contractors.[13] Many such transfers were implemented soon after the Monterey Amendments became effective.

Environmental Review Of Monterey Amendments and Subsequent Litigation

A Program EIR was prepared and certified to analyze the environmental effects of implementing the Monterey Agreement/Monterey Amendments. The adequacy of the Program EIR was challenged in litigation filed in 1995 in the Sacramento County Superior Court, and the Superior Court upheld the adequacy of the Program EIR. Before and after the Sacramento County trial court's decision, DWR and the agricultural and urban SWP contractors who had executed the Monterey Agreement began

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12 See, DWR Bulletin 132-04 (September 2005), p. 120 (**Appendix B** of this Final EIR).

13 Neither the Monterey Agreement nor the Monterey Amendments created a new right to carry out permanent transfers of SWP Table A Amounts. That right had existed since the early 1960s through Article 41 of the SWP contracts. The Monterey Amendments simply provided a vehicle through which the SWP agricultural contractors promised that they would support such Article 41 transfers up to 130,000 acre-feet. The Monterey Amendments also did not limit the SWP contractors' rights to implement permanent transfers under existing law other than those described in the Monterey Amendments. (See, e.g., Water Code §§382, 383.)

implementing various amendment provisions, including the completion of permanent transfers of Table A Amounts among agricultural and urban SWP contractors. Again, CLWA's 41,000 afy water transfer was one of eight water transfers effectuated by the Monterey Amendments. The trial court's decision was subsequently appealed. On appeal, the petitioners sought a writ to prevent further implementation of the Monterey Agreement during the appeal. However, the appellate court denied the requested writ.

The appellate court ultimately reversed the trial court's decision. The appellate court held that the Program EIR was improperly prepared by the Central Coast Water Agency, as "Lead Agency" under CEQA, rather than by DWR, which should have been the "Lead Agency." The appellate court also found that the EIR did not sufficiently discuss implementation of a "no project" alternative, and concluded that a new EIR must be prepared and certified.

The appellate court then remanded the case to the Sacramento County trial court and directed that the trial court issue a writ of mandate vacating certification of the EIR and retaining jurisdiction until DWR, as lead agency, prepared and certified an EIR in accordance with CEQA. The appellate court further directed that the trial court consider whether the Monterey Amendments may continue to be implemented while the new EIR is being prepared. (*Planning & Conservation League v. Department of Water Resources* (2000) 83 Cal.App.4th 892.)

The appellate court decision invalidated certification of the Program EIR, but did not set aside, invalidate or otherwise vacate the Monterey Amendments or enjoin the water transfers effected thereunder. Instead, the appellate court directed the trial court to consider under CEQA whether the Monterey Amendments should remain in place pending DWR's preparation of a new EIR, and to retain jurisdiction pending certification of that EIR. In addition, no court orders have ever been issued to "stay" further implementation of the Monterey Amendments.

The Monterey Settlement Agreement

In March 2001, before the Sacramento County trial court had acted on remand, the parties to the *PCL* litigation entered into settlement negotiations. In May 2003, DWR, Central Coast Water Authority, Planning and Conservation League, certain SWP contractors (including CLWA) and other entities entered into a final settlement of the *PCL* litigation (the "Monterey Settlement Agreement").[14] Under the Monterey Settlement Agreement, the parties expressly agreed that the SWP would continue to be

[14] The Monterey Settlement Agreement is presented in **Appendix B** of this Final EIR.

administered and operated in accordance with both the Monterey Amendments and terms of the Monterey Settlement Agreement:

> "Pending the Superior Court's issuance of an order discharging the writ of mandate in the underlying litigation, the Parties will jointly request that the Superior Court enter an order approving this Settlement Agreement, and an order, pursuant to California Public Resources Code Section 21168.9, authorizing on an interim basis the administration and operation of the SWP. . . in accordance with the Monterey Amendments, [and] the terms of this Settlement Agreement. . ." (Final EIR, **Appendix B** [Monterey Settlement Agreement, p. 9])

The Monterey Settlement Agreement did not set aside, invalidate or otherwise vacate the Monterey Amendments, or any of the water transfers effectuated under the Monterey Amendments. On June 6, 2003, the Sacramento County Superior Court issued the requested order, pursuant to CEQA (Public Resources Code Section 21168.9), approving both the Monterey Settlement Agreement and the administration and operation of the SWP pursuant to the Monterey Amendments and the terms of the approved agreement.[15]

Section III(C)(4) of the Monterey Settlement Agreement required DWR to carry out an "[a]nalysis of the potential environmental effects relating to" eight water transfers under the Monterey Amendments, seven so-called "Attachment E Transfers" and the 41,000 afy water transfer, also referred to in the agreement as the "Kern-Castaic Transfer." Further, the Monterey Settlement Agreement obligated DWR to evaluate all eight of the water transfers in the same manner, even though seven of them, defined in the agreement as the "Attachment E Transfers," were no longer subject to legal challenge (See, Final EIR, **Appendix B** [Monterey Settlement Agreement, Sections III(C)(4), III(D), III(E), pp. 11–12]). The point of the DWR review of the eight transfers was not to determine whether to continue the transfers, because seven of them were final and beyond CEQA re-consideration, and the eighth, the 41,000 afy transfer, was also a permanent transfer, but it was still subject to litigation. Rather, the point of the DWR review of all eight transfers was to examine the environmental effects of all of the transfers, in addition to other factors included within the Monterey Amendments.

In fact, Section III(D) of the Monterey Settlement Agreement affirmed that none of the parties could challenge the effectiveness or validity of the Attachment E Transfers, which had been litigated in other forums or had become final without challenge by the expiration of applicable statutes of limitations. According to CLWA and other signatories to the Agreement, this is why Section III(D) referred to the Attachment E Transfers as "final." (See, Final EIR, **Appendix B** [Monterey Settlement Agreement, Section III(D), p. 12]). The 41,000 afy water transfer was not included among the Attachment E transfers,

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15 The Sacramento County trial court's order is presented in **Appendix B** of this Final EIR.

only because the 41,000 afy water transfer was then under the jurisdiction of the Los Angeles County Superior Court and that litigation was ongoing.[16]

Section III(E) protected the jurisdiction of the Los Angeles County Superior Court in connection with the then-pending CEQA litigation challenging the validity of CLWA's EIR on the 41,000 afy water transfer. Section III(E) states, in part: "nothing in this Settlement Agreement is intended to predispose the remedies or other actions that may occur in that pending litigation." As set forth below, Section III(E) provides:

> "Acknowledgement and Agreement Regarding Kern-Castaic Transfer [the 41,000 afy water transfer]. With respect to Section III(C)(4)(b) regarding the Kern-Castaic Transfer, the Parties recognize that such water transfer is subject to pending litigation in the Los Angeles County Superior Court following remand from the Second District Court of Appeal. (See Friends of the Santa Clara River v. Castaic Lake Water Agency, 95 Cal.App.4th 1373, 116 Cal.Rptr.2d 54 (2002); review denied April 17, 2002.) The Parties agree that jurisdiction with respect to that litigation should remain in that court and that nothing in this Settlement Agreement is intended to predispose the remedies or other actions that may occur in that pending litigation." (Emphasis added.) (Final EIR, **Appendix B** [Monterey Settlement Agreement, Section III(E), p. 12])

The Monterey Settlement Agreement does not preclude CLWA, a signatory to that agreement, from using the 41,000 afy water transfer as part of its overall SWP Table A supplies for planning purposes. First, the language of the Monterey Settlement Agreement, quoted above, does not state that CLWA may not rely on the 41,000 afy water transfer (also referred to as the Kern-Castaic transfer). Second, nothing in the Monterey Settlement Agreement precludes a project EIR from referencing and using all of CLWA's SWP Table A supplies in analyzing available water supplies for the Santa Clarita Valley. Given that the 41,000 afy water transfer was specifically covered by the Monterey Settlement Agreement, if the parties to that agreement had intended to preclude reliance on the 41,000 afy water transfer, they surely could and would have spelled out that prohibition. Rather than prohibiting CLWA or others from relying on the 41,000 afy water transfer, the Monterey Settlement Agreement made it clear that the transfer was (and remains today) under the jurisdiction of the Los Angeles County Superior Court.

In addition, the Monterey Settlement Agreement allows implementation of the Monterey Amendments and validates the water transfers that already had taken place by the time that agreement took effect. The

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16 In Section VII(I), the parties further agreed that, should the certification of DWR's new EIR be challenged, the challenging parties must stipulate to the continued administration and operation of the SWP during the pendency of that challenge, and, should that challenge be successful, during any future challenges to future DWR EIR's. In turn, Section VII(I), subdivision (1), limits the grounds on which DWR's return to the writ of mandate can be legally challenged, and Section VII(J) prohibits any future litigation challenging the validity of any Monterey Amendments (or any portions thereof). Finally, Sections VII(L) and IX provide that all disputes regarding the Monterey Settlement Agreement must be mediated.

only reason the 41,000 afy water transfer was not included on the list of "final" transfers in Attachment E to that agreement was that it was the subject of ongoing litigation. The 41,000 afy water transfer was both a permanent and final reallocation of SWP Table A Amounts from one SWP contractor to another (CLWA), just as were the other seven transfers; the pending 41,000 afy water transfer litigation did not convert that transfer from permanent to temporary.

Importantly, DWR, itself, includes the 41,000 afy to CLWA in its published "Notices to State Water Project Contractors." For example, on April 18, 2006, DWR sent its notice to SWP contractors stating that DWR was increasing its allocation of 2006 SWP water to its contractors. The table attached to that Notice listed all such contractors' Table A Amounts, and their approved allocations. CLWA's Table A Amount is listed under the Southern California heading in the amount of 95,200 afy, which includes CLWA's 41,000 afy. If DWR did not consider CLWA's 41,000 afy water transfer to be both a permanent and final reallocation of SWP Table A Amounts, it would not publish CLWA's total Table A allocation at 95,200 afy.[17]

Contrary to comments received to date, which attempt to place a cloud over CLWA's reliance upon the 41,000 afy water transfer, the terms of the Monterey Settlement Agreement make clear that the agreement was intended to protect the Los Angeles County Superior Court's jurisdiction in the pending 41,000 afy water transfer litigation. That agreement did not characterize the 41,000 afy water transfer as non-final or non-permanent. And, nothing in that agreement prohibited any party, agency, or other entity from relying on the 41,000 afy water transfer for planning purposes.

CLWA Environmental Review Of 41,000 AFY Water Transfer And Litigation

Prior to completion of the 41,000 afy water transfer, the proposed transfer was the subject of environmental review by CLWA and KCWA and its member district. The agencies selling the 41,000 afy of SWP Table A Amount to CLWA assessed the environmental consequences of the proposed transfer within their service area in a Final EIR, dated June 1998. That EIR was certified in 1998 and was not challenged in court. As a result, that EIR is conclusively presumed to be valid (Pub. Res. Code §21167.2).

CLWA also prepared a supplemental Final EIR, which assessed the environmental effects of CLWA's acquisition of the 41,000 afy within its service area. The Board of Directors of CLWA certified the Supplemental Final EIR in March 1999. Thereafter, in April 1999, a lawsuit was brought in the Los Angeles County Superior Court challenging the adequacy of the EIR under CEQA (*Friends of the Santa Clara River, et al. v. Castaic Lake Water Agency, et al.*, Case No. BS 056954, also referred to as "*Friends*"). The

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17 DWR's April 18, 2006, Notice to State Water Project Contractors is presented in **Appendix B** of this Final EIR.

Los Angeles County trial court in the *Friends* litigation ruled in favor of CLWA and upheld the adequacy of the EIR under CEQA.

In October 2000, the *Friends* petitioners filed an appeal. During the pendency of the *Friends* appeal, the Third District Court of Appeal issued the *PCL* decision, which found the Monterey EIR inadequate and ordered it decertified. On appeal in *Friends*, the Second District Court of Appeal considered the *Friends* petitioners' multiple arguments, and concluded that CLWA's EIR on the 41,000 afy water transfer must be decertified, not because the EIR was substantially inadequate or failed to support the analysis of the transfer's approval, but only because it had been "tiered" from the Monterey EIR, recently found to be inadequate:

> "We have examined all of appellant's other contentions and find them to be without merit. If the PCL/tiering problem had not arisen, we would have affirmed the judgment."[18]

Nonetheless, like the Third District Court of Appeal in the *PCL* decision, the Second District Court of Appeal in *Friends* refused to issue any ruling affecting CLWA's ability to continue to rely on the 41,000 afy water transfer, leaving it to the trial court's discretion whether or not to enjoin CLWA's use of the water pending its completion of a new EIR.

In December 2002, on remand to the Los Angeles County Superior Court, the *Friends* petitioners sought to enjoin CLWA's use of, and reliance upon, the 41,000 afy water transfer under CEQA, but the trial court rejected that request. Specifically, the trial court maintained its jurisdiction over the matter and authorized CLWA to utilize any of the 41,000 afy subject to the following order:

> "Respondent [CLWA] will not be prohibited from using the water to which it is entitled, but Petitioner may renew its application for such prohibition based upon evidence of the actual use of such additional water for purposes it considers improper."[19]

The *Friends* petitioners never pursued the trial court's suggestion for them to "renew" their request to prohibit the use of the 41,000 afy water transfer "based upon evidence of the actual use of such additional water for purposes it considers improper." Instead, the *Friends* petitioners appealed the trial court's judgment and, again, requested that the use of the 41,000 afy water transfer be prohibited.

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18 The January 2002 Friends decision, *Friends of the Santa Clara River v. Castaic Lake Water Agency* (2002) 95 Cal.App.4th 1373, provides useful factual background information concerning the Monterey Amendments, the Monterey Amendments EIR, water transfers authorized by the Monterey Amendments, the local agency environmental review of the 41,000 afy water transfer, CLWA's acquisition of the 41,000 afy, and the relationship between the PCL decision and the Friends decision.

19 For the trial court's decision, please refer to **Appendix B**, p. 2 ¶6, of this Final EIR.

However, on December 1, 2003, in an unpublished decision, the Second District Court of Appeal affirmed the trial court's ruling allowing CLWA to utilize and rely on the 41,000 afy water transfer pending completion of its new EIR.[20] Significantly, petitioners and others in the *Friends II* decision argued that the trial court's determination of whether to enjoin CLWA's use of the 41,000 afy water transfer should be based on the status of the *PCL* litigation and DWR's new EIR for the Monterey Amendments. In making that argument, they relied on language in the original *Friends* decision in which the Court of Appeal suggested that *as one option* CLWA "may be able to cure the *PCL* problem by awaiting action by the DWR complying with the *PCL* decision, then issuing a subsequent EIR, supplement to EIR, or addendum to EIR. . . tiering upon a newly certified Monterey Agreement EIR."[21] The Court of Appeal in *Friends II*, however, rejected this argument, explaining:

> "Amici misapprehend our directions to the trial court. As explained above, those directions are found in the dispositional language of our opinion. That language directed the trial court, inter alia, to "consider such orders it deems appropriate under [Pub.Res.Code] section 21168.9." [Citation.] That section grants the trial court broad powers to fashion equitable relief. [Note.] Amici's argument that the exercise of said discretion was to be based upon the status of either the PCL litigation or the new EIR for the Monterey Agreement is at odds with the clear dispositional language we employed. The two paragraphs in our opinion upon which amici rely were merely suggestions as to how respondent could proceed and a statement that, in exercising its discretion whether to grant equitable relief pending completion of a new EIR for this project, the trial court could ascertain, and if it so chose, rely upon the status of the PCL litigation and new Monterey Agreement EIR." (Emphasis added; Landmark Village Final EIR, **Appendix B** [*Friends II*, p. 17])

The Court of Appeal not only refused to enjoin the 41,000 afy water transfer, but also made it clear that CLWA's use of that water is not legally bound to either the *PCL* litigation or to DWR's new EIR for the Monterey Amendments.

Accordingly, neither the *PCL* litigation, the Monterey Settlement Agreement, nor the *Friends* or *Friends II* litigation has changed the status of the 41,000 afy water transfer from a permanent, final allocation of SWP Table A water to a "temporary or non-final" water transfer. On the contrary, the Monterey Settlement Agreement specifically provides that the SWP will continue to be administered and operated in accordance with both the Monterey Amendments and the terms of the Settlement Agreement, and the *Friends* trial court issued its Judgment permitting CLWA to continue to use the 41,000 afy, a decision that the Second District Court of Appeal affirmed. Thus, the two courts charged with responsibility over the

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20 For the Court of Appeal's unpublished opinion, please refer to **Appendix B** of this Final EIR [Friends of the Santa Clara River v. Castaic Lake Water Agency, 2003 WL 22839353 (*Friends II*)].

21 Please see **Appendix B** of this Final EIR (*Friends II*, p. 16).

41,000 afy water transfer have determined that CLWA may use the water to which it is entitled pending preparation of CLWA's new EIR.

Furthermore, CLWA completed and, on December 22, 2004, certified its new EIR on the 41,000 afy water transfer. The CLWA 2004 EIR fully analyzed the environmental implications of the 41,000 afy water transfer without tiering from the Monterey EIR.[22] On December 30, 2004, CLWA lodged the certified Final EIR with the Los Angeles County Superior Court, as part of its "return" to the trial court's writ of mandate issued by the trial court as directed in the *Friends I* decision. There was no opposition filed to CLWA's return, which challenged the adequacy of CLWA's 1999 EIR on the 41,000 afy water transfer. On February 1, 2005, petitioner, Friends of the Santa Clara River, filed a request for entry of a dismissal with prejudice of the *Friends I* action, which was subsequently entered by the Los Angeles County Superior Court, terminating the *Friends I* action.

CLWA's 2004 EIR is currently the subject of two pending petitions for writ of mandate under CEQA challenging the adequacy of that EIR. The petitions were filed in January 2005 and later consolidated in *California Water Impact Network, et al. v. Castaic Lake Water Agency*, Los Angeles County Superior Court No. BS098724, Hon. James C. Chalfant, presiding. On April 2, 2007, Judge Chalfant issued a Statement of Decision (Chalfant Decision).

In the Chalfant Decision, the trial court rejected all of petitioners' arguments and found that CLWA's 2004 EIR on the 41,000 afy water transfer "was properly prepared except for one defect – it fails to show the analytical route as to how and why the three allocations of pre-Monterey Amendments, pre-Monterey Amendments without Article 18, and post-Monterey Amendments are relevant and would occur." (Chalfant Decision, p. 30.)

Importantly, the trial court found that CLWA may act as the lead agency for the 41,000 afy water transfer. (Id.) The trial court also found that the 41,000 afy water transfer is final and valid, and may not be terminated by the parties or DWR. (Chalfant Decision, p. 13.) In addition, the trial court made it clear that CLWA "is not directed to set aside the [41,000 afy] water transfer." (Chalfant Decision, p. 30.) Nonetheless, because of the one defect identified in the 2004 EIR, the trial court granted in part the petitions for writ of mandate, and will issue a writ commanding CLWA to set aside its approval of the 2004 EIR, and to comply with CEQA, either through the preparation of a new EIR or other environmental documents, such as an addendum, addressing the analytic route of the three water allocations. (Id.)

On July 12, 2007, petitioners filed an appeal of the Chalfant Decision, and CLWA filed a cross-appeal.

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22 CLWA's Draft and Final EIR (SCH No. 1998041127) for the 41,000 afy water transfer are found in Appendix 4.10 of the Landmark Village Draft EIR.

The County has made the factual determination, based on substantial evidence, that it remains appropriate for the Santa Clarita Valley to rely on the 41,000 afy water transfer as part of CLWA's SWP supplies in assessing water supply and demand in the Valley, while acknowledging and disclosing the potential uncertainty created by the pending litigation. (See also, **Topical Response 5**: Litigation Concerning Water Supplies.)

Uncertainties Concerning CLWA's 41,000 AFY Water Transfer

Comments state that the pending litigation challenges to CLWA's 2004 EIR for the 41,000 afy transfer, and DWR's preparation of a new Monterey Agreement EIR, introduce an element of potential uncertainty regarding the 41,000 afy water transfer. The County has acknowledged and considered these potential uncertainties, and has concluded that, based on a review of all the surrounding circumstances, these events do not significantly affect the availability or reliability of the transfer amount. Therefore, the County has concluded it is still appropriate to rely on the transfer amount as part of CLWA's 95,200 afy Table A Amount for the Santa Clarita Valley, for the reasons discussed below.

- First, the 41,000 afy water transfer was memorialized in 1999 in a DWR/CLWA water supply contract amendment, and DWR has allocated and annually delivered the water in accordance with the completed transfer since 2000. At the same time, DWR and KCWA executed Amendment No. 28 to the water supply contract between these parties, which also provided for the permanent transfer of the 41,000 afy by KCWA, acting on behalf of its member district, to CLWA, which DWR also stated was consistent with the implementation of the Monterey Amendments. Neither of these contract amendments was ever legally challenged, and both are considered permanent and in full force and effect. In connection with that transfer, CLWA paid approximately $47 million for the additional 41,000 afy Table A supply, the monies have been delivered, the sale price has been financed through the sale of CLWA tax-exempt bonds, and DWR has approved and amended CLWA's long-term water supply contract to reflect the increase in CLWA's SWP Table A Amount, and the permanent transfer and reallocation of SWP Table A supply between SWP contractors.

- Second, DWR has from its inception treated the 41,000 afy water transfer as a "permanent" Table A transfer from one SWP contractor to another, and has stated that the transfer is consistent with implementation of the Monterey Amendments, which provide for the "permanent" transfer of up to 130,000 afy of agricultural Table A Amounts to urban SWP contractors.

- Third, the Monterey Settlement Agreement expressly authorized the operation of the SWP in accordance with the Monterey Amendments and the terms of the settlement agreement. The Monterey Amendments, which are still in effect, authorized SWP contractors to transfer unneeded SWP supply amounts to other contractors on a permanent basis. Specifically, the Monterey Agreement provisions authorized 130,000 afy of agricultural SWP contractors' entitlements to be available for sale to urban SWP contractors. CLWA's 41,000 afy acquisition was a part of the 130,000 afy of SWP Table A supply that was transferred, consistent with the Monterey Amendments. The 41,000 afy transfer was not listed on Attachment E to the Monterey Settlement Agreement with the other permanent transfers because it was the only permanent transfer that was subject to then pending litigation (i.e., the *Friends I* litigation). The Monterey Settlement Agreement otherwise

treated all eight of the permanent transfers the same, and provided that DWR's new EIR would do so, as well, as DWR has affirmed in a letter commenting on the CLWA 2004 EIR for the 41,000 afy water transfer. No other transfers that were part of the 130,000 afy were the subject of litigation.

- Fourth, as to the new Monterey EIR, the Court of Appeal in the 41,000 afy litigation has stated that CLWA's use of the 41,000 afy is not legally bound to the *PCL* litigation, or to DWR's new Monterey EIR.

- Fifth, no court has ever enjoined the 41,000 afy water transfer. This fact provides further certainty to the permanency of the 41,000 afy water transfer.

- Sixth, as stated above, CLWA's amended water supply contract documenting the 41,000 afy water transfer remains in full force and effect, and no court has ever questioned the validity of the contract or enjoined the use of this portion of CLWA's SWP Table A Amount.

- Seventh, although the CLWA's 2004 EIR was found defective in one respect, the trial court decision determined that under contract and validation law, the 41,000 afy water transfer, which was entered into in 1999 and approved by DWR, was valid and final as a matter of law. (Chalfant Decision, pp. 13, 22.) The trial court also found that neither the parties nor DWR can terminate the 41,000 afy water transfer and that nothing in CEQA permits a public agency to "void a contract." (Id., p. 13.) While the Chalfant Decision is a trial court determination only, and subject to appeal, the County nonetheless concurs with the trial court's factual findings concerning the validity and finality of the 41,000 afy water transfer.

CLWA Need Not Wait for DWR's EIR on the Monterey Agreement/Amendments

Other comments have stated that the Monterey Settlement Agreement requires that DWR's new Monterey EIR analyze, among others, the 41,000 afy water transfer; and, therefore, water from that transfer should not be relied upon until DWR completes its new EIR. The response to this claim is provided below.

First, nothing in either the Monterey Settlement Agreement or the related court orders preclude CLWA from using or relying upon the 41,000 afy water transfer, which remains intact. Second, nothing in the terms of the Monterey Settlement Agreement precludes CLWA from proceeding with its 2004 EIR to address the environmental implications of the 41,000 afy water transfer. Again, if the Monterey Settlement Agreement had intended such a result, then it is reasonable to assume that provisions would have been included in that agreement making it clear that CLWA could not proceed with its own EIR on the 41,000 afy water transfer. In fact, no such provisions were included in the Monterey Settlement Agreement, because such provisions would have interfered with the jurisdiction of another court in the separately pending 41,000 afy water transfer litigation.

Third, although the Monterey Settlement Agreement requires the new Monterey EIR to analyze the potential environmental effects relating to CLWA's 41,000 afy water transfer as well as the other permanent transfers, it does not, and cannot, preclude CLWA from conducting its own environmental review of that transfer. Indeed, CLWA *was required* by court order to prepare a new EIR to address the environmental implications of the 41,000 afy water transfer.[23] In the meantime, however, there are no court orders precluding CLWA from using or relying on that water supply.

In addition, CLWA already has completed and certified the 2004 EIR, which has addressed the environmental impacts of the 41,000 afy water transfer, without tiering from, or relying on, the decertified 1995 Monterey EIR. Although that EIR has been found defective in one respect by the trial court, the court rejected petitioners' argument that CLWA was required to wait until DWR completes its own EIR on the Monterey Agreement/Amendments. In doing so, the court found that, since the 41,000 afy transfer is a separate project from that analyzed in DWR's Monterey EIR in both substance and time (Chalfant Decision, p. 16–20), CLWA's decision to prepare its EIR before DWR's Monterey EIR was proper, particularly because the CLWA EIR did not impermissibly tier from DWR's future EIR (Id., at pp. 20–21).

In short, nothing in CEQA or any law, regulation, or agreement constrains or limits CLWA's discretion to use the 41,000 afy water transfer.

For all these reasons, the County has determined that it remains appropriate to rely on the 41,000 afy water transfer as part of CLWA's SWP Table A water supplies for the Santa Clarita Valley. Furthermore, the County has previously made factual determinations about whether the 41,000 afy water transfer may be relied upon for planning purposes despite known legal uncertainties. At that time, the County previously determined it was reasonable to conclude that even if a court finds the CLWA 2004 EIR legally deficient, that court, like all others before it, will again refuse to enjoin the permanent 41,000 afy water transfer, and instead require further revisions to that EIR. The County's prior determination was proven accurate in the Chalfant Decision. Although the Chalfant Decision was rendered at the trial court level only, and may likely be appealed by one or more parties, the County's determination remains a valid forecast in light of the litigation and other events summarized above. (See *CEQA Guidelines* §15144.) Therefore, the County has concluded that the pending legal challenges to the 41,000 afy water transfer give rise to litigation uncertainties and that the County will continue to monitor issues surrounding the 41,000 afy water transfer. However, at this time, the County has determined that the on-going litigation

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[23] In the Judgment granting the writ of mandate setting aside CLWA's certification of the 41,000 afy EIR, the trial court specifically retained "jurisdiction until respondent Castaic Lake Water Agency certifies an Environmental Impact Report that complies with the California Environmental Quality Act and is consistent with the views expressed by the Court of Appeal Opinion, filed January 10, 2002, Case No. B145283." (Landmark Village Final EIR, **Appendix B** [Judgment Granting Peremptory Writ of Mandate, dated October 25, 2002, p. 2, ¶3].)

over the 41,000 afy water transfer should have no impact on the amount of SWP water available to CLWA as a result of the completed 41,000 afy water transfer.

Other Litigation Concerning the 41,000 AFY Transfer

As stated above, Landmark Village does not rely on SWP supplies; instead, Landmark Village will use local groundwater and recycled water from local water reclamation plants to meet the project's potable and non-potable water demand. Nonetheless, for information purposes, the Landmark Village Draft EIR, at pp. 4.10-52 through 4.10-57, provided a description of litigation concerning the 41,000 afy transfer. The text below further elaborates on litigation concerning the 41,000 afy water transfer.

California Oak Foundation Decision (Gate-King I)

The CLWA 41,000 afy water transfer has been the subject of recent court decisions. The first court case involved a published appellate court decision in *California Oak Foundation v. City of Santa Clarita* (2005) 133 Cal.App.4th 1219. In the *California Oak Foundation* decision, the Court of Appeal invalidated an EIR under CEQA for the Gate-King project located in the City of Santa Clarita, because the EIR did not explain how demand for water would be met if the 41,000 afy water transfer were set aside, or, alternatively, why it is appropriate to rely on the 41,000 afy transfer in any event. In fact, in *California Oak Foundation*, the court found that the EIR contained "no discussion at all" of the uncertainty surrounding the 41,000 afy transfer due to decertification of the EIR for that transfer in *Friends I, supra*, 95 Cal.App.4th 1373. (Id., *California Oak Foundation*, 133 Cal.App.4th at 1236.)

In contrast, here, the Landmark Village project does not rely on CLWA's SWP supplies, including the 41,000 afy transfer; and, therefore, the project does not need those supplies to satisfy its water demand. Instead, the Landmark Village project relies on local groundwater to meet its potable water demand, and recycled water from the Newhall Ranch WRP for its non-potable water demand. Because the Landmark Village project does not rely on or use CLWA's SWP supplies, the "validity" or "uncertainty" of the 41,000 afy water transfer is not at issue. Nonetheless, both the Landmark Village Draft EIR and this topical response explain in detail why it is appropriate for the County to rely on the 41,000 afy water transfer as part of CLWA's SWP water supplies, despite uncertainties created by pending litigation. This detailed evaluation of the uncertainties associated with the availability of the 41,000 afy water transfer was not included in the Gate-King EIR. This omission made the Gate-King EIR vulnerable to legal challenge, in stark contrast to the comprehensive information and analysis provided in the Landmark Village Draft EIR. The analysis provided in this EIR, including this topical response, constitutes the substantial evidence that the *California Oak Foundation* decision requires a lead agency to undertake with respect to the 41,000 afy water transfer. (See *California Oak Foundation, supra*, 133 Cal.App.4th at 1238 [The court found that the question of whether the 41,000 afy water transfer should be used for planning purposes,

when its prospective availability is legally uncertain, is a decision that "must be made by the City," based on substantial evidence].

***California Oak Foundation* Decision II (Gate-King II)**

On August 15, 2007, in *Santa Clarita Oak Conservancy, et al. v. City of Santa Clarita, et al.* (Los Angeles County Superior Court Case No. BS084677), the Los Angeles County Superior Court again addressed the Gate-King project in the Santa Clarita Valley. In this second round of litigation, the City of Santa Clarita prepared and recirculated a Final Additional Analysis to the previous 2003 EIR for the Gate-King Industrial Park project. The additional environmental analysis was conducted in response to the Court of Appeal's decision, reversing and directing the trial court to issue a writ of mandate vacating the City's prior certification of the 2003 EIR for the Gate-King project on the grounds that it failed to contain substantial evidence of sufficient water supplies, including an evaluation of the legal uncertainties associated with CLWA's 41,000 afy water transfer. (*California Oak Foundation v. City of Santa Clarita* (2005) 133 Cal.App.4th 1219, cited in the paragraph above.) The Court of Appeal found no other deficiencies in the 2003 EIR. (*California Oak Foundation*, 133 Cal.App.4th at 1236-41.)

Based upon a lengthy water analysis presented in the Final Additional Analysis for the Gate-King Industrial Park project, the Superior Court issued a statement of decision finding that the City of Santa Clarita was not legally precluded from relying upon the 41,000 afy water transfer pending completion of the litigation surrounding the Monterey Agreement and DWR's completion of the new program EIR for the Monterey Amendments. (Statement of Decision, pp. 6–8.)[24] In addition, the Superior Court found that three prior decisions[25] do not preclude the City's reliance on the 41,000 afy water transfer. (*Id.* p. 9.) The Superior Court also found that the Monterey Settlement Agreement and DWR's pending EIR on the Monterey Amendments do not preclude the City from relying upon the 41,000 afy water transfer. (*Id.* pp. 9–11.) Further, the Superior Court determined that the April 2007 trial court decision invalidating CLWA's EIR for the 41,000 afy water transfer in *California Water Impact Network v. Castaic Lake Water Agency* (Los Angeles County Superior Court No. BS098724) did not undermine or otherwise invalidate the City's additional environmental analysis with respect to the 41,000 afy water transfer. (*Id.* pp. 11–13.) Finally, the Superior Court analyzed the principles set forth in *Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho Cordova* (2007) 40 Cal.4th 412, and found that the 41,000 afy water transfer

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24 The Superior Court's Statement of Decision in connection with the Gate-King Industrial Park project is found in **Appendix B** of this Final EIR.

25 The Superior Court was referring to three prior decisions that the petitioners in the case asserted precluded the City from relying upon the 41,000 afy water transfer. The three decisions were: (1) *Planning and Conservation League v. Dept. of Water Resources* (2000) 83 Cal.App.4th 892; (2) *Friends of the Santa Clara River v. Castaic Lake Water Agency* (2002) 95 Cal.App.4th 1373; and (3) *California Oak Foundation v. City of Santa Clarita* (2005) 133 Cal.App.4th 1219.

was sufficiently reliable to excuse the City from identifying alternative water sources *in lieu* of the 41,000 afy water transfer.

West Creek Decision

Another court case involved a separate legal challenge under CEQA to an EIR for the West Creek project, located in Los Angeles County. This separate legal challenge was brought in Santa Barbara County Superior Court in *Santa Clarita Organization for Planning the Environment v. County of Los Angeles*, Case No. 1043805 (*West Creek* litigation). After a hearing, the Santa Barbara County Superior Court issued an Order determining that the EIR prepared for the West Creek project contained substantial evidence in the record to support Los Angeles County's decision to rely on the 41,000 afy water transfer for planning purposes.[26] The Order noted that substantial evidence appeared in the record to support the County's decision to rely on the 41,000 afy water transfer, while acknowledging and disclosing the potential uncertainties involving the 41,000 afy water transfer created by pending litigation. The Order summarized the evidence, including the fact that: (a) DWR continues to allocate and deliver the water in accordance with the amended water supply contract authorizing the 41,000 afy transfer; (b) neither the *PCL* litigation, nor the Monterey Settlement Agreement set aside any of the water transfers made under the Monterey Amendments, including the 41,000 afy water transfer; and (c) the courts have not enjoined CLWA's use of the 41,000 afy water transfer. A copy of the trial court Order in the *West Creek* litigation is provided in Appendix 4.10 of the Landmark Village Draft EIR. The *West Creek* decision is currently on appeal, and was argued and submitted for decision on June 13, 2007.

On September 25, 2007, the Court of Appeal, Second Appellate District, Division Six, issued its decision in connection with the West Creek project. The decision is certified for publication (*Santa Clarita Organization for Planning the Environment v. County of Los Angeles* (September 25, 2007, No. B189116) 2007 WL2773399).[27] In this decision, the Court of Appeal held that the West Creek EIR adequately analyzed the water supply available to the West Creek project. The Court of Appeal also specifically found that the EIR adequately evaluated the uncertainties surrounding reliance upon the 41,000 afy water transfer. In reaching its decision, the Court of Appeal expressly determined that the EIR satisfied the four principles for assessing adequacy of water supplies, which were recently articulated by the California Supreme Court in *Vineyard*, *supra*, 40 Cal.4th 412. In finding the West Creek EIR adequate in the context of the *Vineyard* principles, the Court of Appeal confirmed that the EIR need not evaluate *alternative* water

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[26] In contrast to the West Creek project, the Landmark Village project relies upon local groundwater supplies to meet the project's potable water demands, and recycled water from the Newhall Ranch WRP to meet the project's non-potable water demands. The Landmark Village project does not rely on CLWA's SWP supplies, including the 41,000 afy water transfer.

[27] The Court of Appeal decision in connection with the West Creek project is found in **Appendix B** of this Final EIR.

sources to the 41,000 afy water transfer because, as stated by the Court of Appeal, the degree of uncertainty associated with that transfer was "insubstantial." (*Santa Clarita Organization for Planning the Environment v. County of Los Angeles*, 2007 WL2773399, at p. 8.)

***Riverpark* Decision**

A third court case raising the same 41,000 afy water transfer issues involves the Riverpark project, located in the City of Santa Clarita, County of Los Angeles. The Landmark Village Draft EIR discussed the *Riverpark* litigation and decision in detail. (Draft EIR, p. 4.10-56.) A copy of the trial court decision in the *Riverpark* litigation also was provided in Appendix 4.10 of the Draft EIR.

As stated in the Draft EIR, the Los Angeles County Superior Court issued a decision in the *Riverpark* litigation determining that the City of Santa Clarita had properly relied on the 41,000 afy water transfer for planning purposes, and rejected petitioners' claims that legal uncertainties surrounding that transfer due to other litigation (citing *Planning and Conservation League*, *supra*, 83 Cal.App.4th 892, *Friends I*, *supra*, 95 Cal.App.4th 1373, and *California Oak Foundation*, *supra*, 133 Cal.App.4th 1219) precluded the City from relying on water from that transfer for planning purposes. The court determined that the 41,000 afy water transfer was sufficiently certain, and that the Monterey Settlement Agreement did not preclude the City from relying on the transfer in its EIR for the Riverpark project pending DWR's preparation of a new Monterey EIR. The court also found that substantial evidence in the EIR and record supported the City's decision that water from the 41,000 afy transfer could be relied on as part of CLWA's supplies.

Since preparation of the Landmark Village Draft EIR, the *Riverpark* trial court decision was appealed. The appeal is currently pending, and is in the briefing stages.

2005 UWMP

A fourth court case also raising the same 41,000 afy water transfer issues challenges the adequacy of the 2005 Urban Water Management Plan (2005 UWMP), which was adopted by CLWA and other retail purveyors in the Santa Clarita Valley (*California Water Impact Network, et al. v. Castaic Lake Water Agency, et al.*, Los Angeles County Superior Court Case No. BS103295). The Landmark Village Draft EIR discussed this *2005 UWMP* litigation. Since preparation of the Draft EIR, the *2005 UWMP* litigation was argued and submitted for decision to the Los Angeles County Superior Court on June 25, 2007.

On August 3, 2007, the Los Angeles County Superior Court upheld the adequacy of the 2005 UWMP.[28] In addressing the 2005 UWMP's consideration of the 41,000 afy water transfer, the court noted that all of the relevant facts, including pending litigation, were disclosed in the 2005 UWMP. The trial court further

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[28] The Superior Court's Statement of Decision in the 2005 UWMP litigation is found in **Appendix B** of this Final EIR.

found that the 2005 UWMP identified substantial evidence supporting its determination that the 41,000 afy transfer was reliable in spite of the pending litigation, including evidence that: (i) the 41,000 afy transfer has been allocated and delivered since its creation; (ii) no court has enjoined the 41,000 afy transfer; (iii) the contracts memorializing the 41,000 afy transfer remain in "full force and effect."

Conclusion

In conclusion, there are two points that should be emphasized. First, Landmark Village does not rely on SWP supplies; instead, Landmark Village will use local groundwater and recycled water from local water reclamation plants to meet the project's potable and non-potable water demand. Second, one of the primary purposes of this topical response is to respond to public comments regarding the 41,000 afy water transfer, and to inform decision makers and the public of pending and related litigation concerning CLWA's 41,000 afy water transfer, so that the information can be taken into account in assessing the overall adequacy of water supplies in the Santa Clarita Valley. In making that informed decision, the law does not require absolute certainty, finality, or freedom from all legal challenges, for a source of water to be included in overall water supplies. Based on the above information, the County has determined that CLWA's 41,000 afy water transfer is sufficiently certain, so that it is not only permissible but reasonable to include the 41,000 afy in CLWA's water supply sources for the Santa Clarita Valley as a whole. However, the Landmark Village project does not rely on CLWA's SWP supplies or the 41,000 afy transfer, which is part of those supplies, because the Landmark Village project will use local groundwater supplies to meet the project's potable water demands and recycled water from the Newhall Ranch WRP to meet the project's non-potable water demands.

TOPICAL RESPONSE 5: LITIGATION CONCERNING WATER SUPPLIES

Pointing to various litigation matters, comments have stated that there is a probable lack of water supplies for the Landmark Village project. Other comments cite pending litigation as evidence that the Castaic Lake Water Agency (CLWA) 41,000 afy water transfer is "further compromised." These comments generally take the position that pending litigation creates uncertainty regarding the availability and reliability of water supplies to serve the Santa Clarita Valley.

The purpose of this topical response is to summarize various statewide, regional, and local litigation matters concerning water supplies. Before responding in detail, however, the County of Los Angeles desires to place the water-related litigation challenges into perspective.

CEQA does not provide that merely because a program or project has been challenged in litigation, it cannot be considered by a lead agency in analyzing the potential impacts of such action. CEQA also does not require absolute certainty or finality from all litigation challenges before a water source can be included in a water agency's overall supplies. In addition, the Landmark Village project does not rely on State Water Project (SWP) supplies, CLWA's 41,000 afy SWP water transfer, or Central Valley Project (CVP) supplies; instead, the project will use local groundwater and recycled water from the local Newhall Ranch Water Reclamation Plant (WRP) to meet its potable and non-potable water demand. In that context, and based on the substantial evidence before it, as discussed below, the County has determined that: (a) local water supplies for Landmark Village are sufficient to meet the project's potable and non-potable demands; (b) the Landmark Village project will not contribute to any significant cumulative impacts on Santa Clarita Valley's water supplies, because Landmark Village is relying only upon local groundwater and recycled water to meet its potable and non-potable demands; and (c) in any case, CLWA's 41,000 afy water transfer is sufficiently certain, despite litigation, for that water to be reasonably included in CLWA's overall SWP water supplies for the Santa Clarita Valley as a whole. (See also, Landmark Village Draft EIR, Section 4.10, pp. 4.10-52-4.10-57; and **Topical Response 4**: CLWA's 41,000 AFY Water Transfer.)

Finally, the water supplies identified for Landmark Village are both available and reliable to serve the project without relying upon CLWA's SWP supplies or the 41,000 afy transfer; and because the project relies only upon local groundwater and recycled water to meet its potable and non-potable demands, it does not contribute to any significant cumulative water impacts in the Santa Clarita Valley.

1. Litigation Concerning The Monterey Amendments and the CLWA 41,000 AFY Water Transfer

The lawsuits relating to both the Monterey Amendments and CLWA's 41,000 afy water transfer were summarized in the Landmark Village Draft EIR, Section 4.10, pp. 4.10-52 through 4.10-57, and will not be repeated in this response. However, this response will highlight relevant litigation since the Landmark Village Draft EIR was released for public review in November 2006.

(a) *Santa Clarita Organization for Planning the Environment v. County of Los Angeles* (2003) 106 Cal.App.4th 715 (*West Creek I* decision)

In the *West Creek I* decision issued in February 2003, the Second District Court of Appeal, Division Six, directed the trial court to issue a writ of mandate ordering the County of Los Angeles to vacate its certification of the EIR for the West Creek project, a mixed residential and commercial development, located in the Santa Clarita Valley. In the *West Creek I* decision, the Court of Appeal held that the County's conclusion that water supplies would be sufficient for cumulative development, including West Creek, was not supported by substantial evidence, because the EIR's cumulative water supply analysis did not adequately disclose the actual amount of water that the SWP can reliably deliver to CLWA in wet, average and drought years, and did not discuss or analyze the difference between an "entitlement" to SWP water and the actual availability of such supplies. The appellate court criticized the EIR's analysis because, rather than using estimates from DWR or other reliable sources as to the amount of SWP water that is actually available in wet, average and drought years, the analysis instead relied upon 100 percent of CLWA's Table A entitlements in wet and average years, and 50 percent of its Table A entitlements in drought years, without substantial evidence supporting the validity of those percentages. The appellate court concluded that the EIR should have discussed the fact that SWP entitlements cannot be taken at face value, and should have provided reasoned analysis in response to comments raising this problem. The appellate court directed the trial court to issue a writ of mandate vacating certification of the EIR, and to retain jurisdiction until the County had certified an EIR complying with CEQA and the views expressed in the *West Creek I* decision.

Santa Clarita Organization for Planning the Environment v. County of Los Angeles, Santa Barbara Superior Court Case No. 1043805; Second Appellate District No. B189116 (West Creek II decision)[1]

In response to the Court of Appeal's *West Creek I* decision and trial court subsequently issued writ of mandate, the County of Los Angeles prepared a revised EIR to evaluate CLWA's SWP water supplies

[1] A copy of the *West Creek II* trial court's "Order After Hearing," which is currently on appeal, is included in Appendix 4.10 of the Landmark Village Draft EIR.

based on the availability, reliability and supply estimates for SWP water in wet, average and drought years obtained from DWR. The EIR used those estimates to analyze the amount of actual SWP water reliably available to serve the West Creek project and other cumulative development. After certifying the revised EIR, the County filed a "return" to the writ of mandate with the trial court in Santa Barbara County that had retained jurisdiction over the project.

After the hearing, the Santa Barbara County Superior Court issued an "Order After Hearing," determining that the revised West Creek EIR contained substantial evidence to support the County's decision to rely on the 41,000 afy water transfer for planning purposes. The Order noted that, while the County acknowledged and disclosed the potential uncertainties involving the 41,000 afy water transfer created by pending litigation, substantial evidence supported the County's decision to rely on the 41,000 afy water transfer. The Order summarized the evidence, including the facts that: (a) DWR continues to allocate and deliver the water in accordance with the amended water supply contract authorizing the 41,000 afy transfer; (b) neither the *PCL* litigation, nor the Monterey Settlement Agreement set aside any of the water transfers made under the Monterey Amendments, including the 41,000 afy water transfer; (c) the courts have not enjoined CLWA's use of the 41,000 afy water transfer; and (d) CLWA had prepared and certified a new EIR on the 41,000 afy water transfer. The project opponents appealed the trial court's Order discharging the writ.

On September 25, 2007, the Court of Appeal, Second Appellate District, Division Six, issued its second published decision in connection with the West Creek project (*Santa Clarita Organization for Planning the Environment v. County of Los Angeles* (September 25, 2007, No. B189116) 2007 WL2773399).[2] In this decision, the Court of Appeal held that the West Creek EIR adequately analyzed the water supply available to the West Creek project. The Court of Appeal also specifically found that the EIR adequately evaluated the uncertainties surrounding reliance upon the 41,000 afy water transfer. In reaching its decision, the Court of Appeal expressly determined that the EIR satisfied the four principles for assessing adequacy of water supplies, which were recently articulated by the California Supreme Court in *Vineyard*, *supra*, 40 Cal.4th 412. In finding the West Creek EIR adequate in the context of the *Vineyard* principles, the Court of Appeal confirmed that the EIR need not evaluate *alternative* water sources to the 41,000 afy water transfer because, as stated by the Court of Appeal, the degree of uncertainty associated with that transfer was "insubstantial." (*Santa Clarita Organization for Planning the Environment v. County of Los Angeles*, 2007 WL2773399, at p. 8.)

2 The Court of Appeal decision in connection with the West Creek project is found in **Appendix B** of this Final EIR.

(b) California Oak Foundation v. City of Santa Clarita (2005) 133 Cal.App.4th 1219 (*California Oak* decision; Gate-King I)

Comments on the Landmark Village Draft EIR claim that the *California Oak* decision "overturned" the project EIR in that case "because it was based on the illegal 41,000 AF water transfer from Kern County." (See, letter from California Water Impact Network, dated February 11, 2007, p. 4.) On the contrary, the *California Oak* decision did not invalidate the EIR for the Gate-King Industrial Park project in the City of Santa Clarita "because it was based on the illegal" 41,000 afy water transfer. Instead, as discussed below, the Court of Appeal found the Gate-King EIR inadequate because the Draft and Final EIR (including responses to comments): (a) contained "no discussion at all of the uncertainty surrounding" the 41,000 afy water transfer; (b) did not "mention the decertification" of the CLWA 1999 EIR for the 41,000 afy transfer; and (c) did not "discuss the fact that [SWP] entitlements are not really entitlements but only 'paper water'." As explained in the *California Oak* decision, the Gate-King EIR should have included *either* an analysis of how demand for water would be met without water from the 41,000 afy transfer, *or* why it was appropriate to rely on the 41,000 afy transfer in any event.

As described by the Court of Appeal in the *California Oak* decision, the Gate-King project proposed to subdivide property to accommodate the Industrial Park development. The City of Santa Clarita certified the EIR for the project, and an environmental group challenged the EIR certification on several grounds, including the City's reliance on the 41,000 afy transfer. The Court of Appeal held that the trial court had erred in approving the certification of the EIR because the EIR's "discussion" of the 41,000 afy water transfer in its water supply discussion was inadequate. (The Gate-King Draft EIR contained only four pages on water supply, which is in sharp contrast to the information presented in the Landmark Village Draft and Final EIRs.)

Specific to the 41,000 afy transfer, the Court of Appeal found that the City had relied upon the transfer, but that the EIR contained "no discussion at all" of the legal uncertainty surrounding the 41,000 afy transfer due to decertification of CLWA's original EIR for that transfer, and because the EIR relied on "paper water" contrary to established law, including the *West Creek I* decision. There was no discussion in either the Draft EIR or the Final EIR (responses to comments) to support the City's decision to rely on the 41,000 afy transfer. The City attempted to cure the EIR's deficiency by preparing an appendix to the EIR, submitted just days before the City's approval of the project. Although the appendix contained some explanation of the legal uncertainty surrounding the 41,000 afy transfer, the appendix incorrectly assumed that, even without the 41,000 afy transfer, there would be sufficient supplies to serve the project by relying on CLWA's SWP entitlements, without discounting those entitlements by reliability estimates from DWR. Thus, the appellate court directed that the EIR be decertified because it did not contain substantial evidence supporting an analysis of how demand for water would be met without the 41,000

afy transfer, *or* in the alternative, why it was appropriate to rely on the 41,000 afy transfer in any event. Id. at p. 1242.

California Oak Foundation Decision II (Gate-King II)

On August 15, 2007, in *Santa Clarita Oak Conservancy, et al. v. City of Santa Clarita, et al.* (Los Angeles County Superior Court Case No. BS084677), the Los Angeles County Superior Court again addressed the Gate-King project in the Santa Clarita Valley. In this second round of litigation, the City of Santa Clarita prepared and recirculated a Final Additional Analysis to the previous 2003 EIR for the Gate-King Industrial Park project. The additional environmental analysis was conducted in response to the Court of Appeal's decision, reversing and directing the trial court to issue a writ of mandate vacating the City's prior certification of the 2003 EIR for the Gate-King project on the grounds that it failed to contain substantial evidence of sufficient water supplies, including an evaluation of the legal uncertainties associated with CLWA's 41,000 afy water transfer. (*California Oak Foundation v. City of Santa Clarita* (2005) 133 Cal.App.4th 1219, cited in the paragraph above.) The Court of Appeal found no other deficiencies in the 2003 EIR. (*California Oak Foundation*, 133 Cal.App.4th at 1236-41.)

Based upon a lengthy water analysis presented in the Final Additional Analysis for the Gate-King Industrial Park project, the Superior Court issued a statement of decision finding that the City of Santa Clarita was not legally precluded from relying upon the 41,000 afy water transfer pending completion of the litigation surrounding the Monterey Agreement and DWR's completion of the new program EIR for the Monterey Amendments. (Statement of Decision, pp. 6–8.)[3] In addition, the Superior Court found that three prior decisions[4] do not preclude the City's reliance on the 41,000 afy water transfer. (*Id*. p. 9.) The Superior Court also found that the Monterey Settlement Agreement and DWR's pending EIR on the Monterey Amendments do not preclude the City from relying upon the 41,000 afy water transfer. (*Id*. pp. 9-11.) Further, the Superior Court determined that the April 2007 trial court decision invalidating CLWA's EIR for the 41,000 afy water transfer in *California Water Impact Network v. Castaic Lake Water Agency* (Los Angeles County Superior Court No. BS098724) did not undermine or otherwise invalidate the City's additional environmental analysis with respect to the 41,000 afy water transfer. (*Id*. pp. 11-13.) Finally, the Superior Court analyzed the principles set forth in *Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho Cordova* (2007) 40 Cal.4th 412, and found that the 41,000 afy water transfer

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3 The Superior Court's Statement of Decision in connection with the Gate-King Industrial Park project is found in **Appendix B** of this Final EIR.

4 The Superior Court was referring to three prior decisions that the petitioners in the case asserted precluded the City from relying upon the 41,000 afy water transfer. The three decisions were: (1) *Planning and Conservation League v. Dept. of Water Resources* (2000) 83 Cal.App.4th 892; (2) *Friends of the Santa Clara River v. Castaic Lake Water Agency* (2002) 95 Cal.App.4th 1373; and (3) *California Oak Foundation v. City of Santa Clarita* (2005) 133 Cal.App.4th 1219.

was sufficiently reliable to excuse the City from identifying alternative water sources *in lieu* of the 41,000 afy water transfer.

(c) *Planning and Conservation League v. CLWA, et al.*, Ventura County Superior Court No. CIV 231588; and *California Water Impact Network v. Castaic Lake Water District, et al.*, Ventura County Superior Court No. CIV 231606 (41K litigation)

In response to the trial court's writ of mandate in *Friends of the Santa Clara River v. Castaic Lake Water Agency* (2002) 95 Cal.App.4th 1373 (*Friends I*), CLWA set aside certification of its prior EIR for the 41,000 afy water transfer, and commenced preparation of a new EIR in January 2003. In June 2004, CLWA circulated a Draft EIR (State Clearinghouse No. 1998041127) that was not tiered from the Monterey EIR disapproved in the *PCL* decision.

On July 28, 2004, CLWA held a public hearing to receive comments on the Draft EIR., and, by the end of November 2004, CLWA prepared and circulated a two-volume Final EIR (State Clearinghouse No. 1998041127). On December 8, 2004, CLWA held an additional noticed public hearing on both the EIR and the 41,000 afy water transfer project. On December 22, 2004, CLWA's Board certified the Final EIR and approved the 41,000 afy water transfer project.[5]

On December 30, 2004, CLWA filed its "return" to the writ of mandate with the Los Angeles County Superior Court. No objections to CLWA's return were filed that challenged the adequacy of CLWA's 2004 EIR on the 41,000 afy water transfer. On February 1, 2005, petitioner, Friends of the Santa Clara River, filed a request for entry of a dismissal with prejudice of the *Friends I* action, which was subsequently entered by the Los Angeles County Superior Court, terminating the *Friends I* action.

CLWA's 2004 EIR is currently the subject of two pending petitions for writ of mandate under CEQA challenging the adequacy of that EIR. The petitions were filed in January 2005 and later consolidated in *California Water Impact Network, et al. v. Castaic Lake Water Agency*, Los Angeles County Superior Court No. BS098724, Hon. James C. Chalfant, presiding. On April 2, 2007, Judge Chalfant issued a Statement of Decision (Chalfant Decision).

In the Chalfant Decision, the trial court rejected all of petitioners' arguments and found that CLWA's 2004 EIR on the 41,000 afy water transfer "was properly prepared except for one defect -- it fails to show the analytical route as to how and why the three allocations of pre-Monterey Amendments, pre-Monterey

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5 Copies of CLWA's Draft EIR, Final EIR, and Resolutions were included in Appendix 4.10 of the Landmark Village Draft EIR.

Amendments without Article 18, and post-Monterey Amendments are relevant and would occur." (Chalfant Decision, p. 30.)

Importantly, the trial court found that CLWA may act as the lead agency for the 41,000 afy water transfer. (Id.) The trial court also found that the 41,000 afy water transfer is final and valid, and may not be terminated by the parties or DWR. (Chalfant Decision, p. 13.) In addition, the trial court made it clear that CLWA "is not directed to set aside the [41,000 afy] water transfer." (Chalfant Decision, p. 30.) Nonetheless, because of the one defect identified in the 2004 EIR, the trial court granted in part the petitions for writ of mandate, and will issue a writ commanding CLWA to set aside its approval of the 2004 EIR, and to comply with CEQA, either through the preparation of a new EIR or other environmental documents, such as an addendum, addressing the analytic route of the three water allocations. (Id.)

On July 12, 2007, petitioners filed an appeal of the Chalfant Decision, and CLWA filed a cross-appeal.

The pending legal challenges to the adequacy of CLWA's 2004 EIR for the 41,000 afy transfer, and DWR's preparation of a new Monterey Amendments EIR, introduce an element of potential uncertainty, not as to the validity or finality of the water transfer itself, but rather as to completion of the environmental analysis for the 41,000 afy water transfer. Based on the above factual and legal circumstances, the County has made the factual determination, based on the Landmark Village Draft EIR, the Final EIR's responses to comments, and the record, that it remains appropriate for the Santa Clarita Valley to rely on the 41,000 afy water transfer as part of CLWA's SWP supplies in assessing water supply and demand in the Valley. While acknowledging that there is uncertainty created by the pending litigation, the County concludes that substantial evidence supports its factual determination that it is still appropriate to include water reliably available from the 41,000 afy water transfer as part of CLWA's SWP supplies for several reasons, including the following:

- First, the 41,000 afy water transfer was memorialized in 1999 in a DWR/CLWA water supply contract amendment, and DWR has allocated and annually delivered the water in accordance with the completed transfer since 2000. At the same time, DWR and KCWA executed Amendment No. 28 to the water supply contract between these parties, which also provided for the permanent transfer of the 41,000 afy by KCWA, acting on behalf of its member district, to CLWA, which DWR also stated was consistent with the implementation of the Monterey Amendments. Neither of these contract amendments was ever legally challenged, and both are considered permanent and in full force and effect. In connection with that transfer, CLWA paid approximately $47 million for the additional 41,000 afy Table A supply, the monies have been delivered, the sale price has been financed through the sale of CLWA tax-exempt bonds, and DWR has approved and amended CLWA's long-term water supply contract to reflect the increase in CLWA's SWP Table A Amount, and the permanent transfer and reallocation of SWP Table A supply between SWP contractors.

- Second, DWR has from its inception treated the 41,000 afy water transfer as a "permanent" Table A transfer from one SWP contractor to another, and has stated that the transfer is consistent with

implementation of the Monterey Amendments, which provide for the "permanent" transfer of up to 130,000 afy of agricultural Table A Amounts to urban SWP contractors.

- Third, the Monterey Settlement Agreement expressly authorized the operation of the SWP in accordance with the Monterey Amendments and the terms of the settlement agreement. The Monterey Amendments, which are still in effect, authorized SWP contractors to transfer unneeded SWP supply amounts to other contractors on a permanent basis. Specifically, the Monterey Agreement provisions authorized 130,000 afy of agricultural SWP contractors' entitlements to be available for sale to urban SWP contractors. CLWA's 41,000 afy acquisition was a part of the 130,000 afy of SWP Table A supply that was transferred, consistent with the Monterey Amendments. The 41,000 afy transfer was not listed on Attachment E to the Monterey Settlement Agreement with the other permanent transfers because it was the only permanent transfer that was subject to then pending litigation (i.e., the Friends I litigation). The Monterey Settlement Agreement otherwise treated all eight of the permanent transfers the same, and provided that DWR's new EIR would do so, as well, as DWR has affirmed in a letter commenting on the CLWA 2004 EIR for the 41,000 afy water transfer. No other transfers that were part of the 130,000 afy were the subject of litigation.

- Fourth, as to the new Monterey EIR, the Court of Appeal in the 41,000 afy litigation has stated that CLWA's use of the 41,000 afy is not legally bound to the PCL litigation, or to DWR's new Monterey EIR.

- Fifth, no court has ever enjoined the 41,000 afy water transfer. This fact provides further certainty to the permanency of the 41,000 afy water transfer.

- Sixth, as stated above, CLWA's amended water supply contract documenting the 41,000 afy water transfer remains in full force and effect, and no court has ever questioned the validity of the contract or enjoined the use of this portion of CLWA's SWP Table A Amount.

- Seventh, although the CLWA's 2004 EIR was found defective in one respect, the trial court decision determined that under contract and validation law, the 41,000 afy water transfer, which was entered into in 1999 and approved by DWR, was valid and final as a matter of law. (Chalfant Decision, pp. 13, 22.) The trial court also found that neither the parties nor DWR can terminate the 41,000 afy water transfer and that nothing in CEQA permits a public agency to "void a contract." (Id., p. 13.) While the Chalfant Decision is a trial court determination only, and subject to appeal, the County nonetheless concurs with the trial court's factual findings concerning the validity and finality of the 41,000 afy water transfer.

Furthermore, based on the above, the County has determined it is reasonable to conclude that CLWA will either appeal the Chalfant decision on limited grounds, and/or correct the one defect noted in CLWA's 2004 EIR either through preparation of a revised EIR or an addendum addressing the one defect noted by the trial court. During the interim, CLWA may continue to rely on, and use, the 41,000 afy water transfer as part of its SWP supplies for the Santa Clarita Valley. Therefore, the County has determined that substantial evidence supports the conclusion that the pending legal challenges to the 41,000 afy water transfer are unlikely to have a substantial adverse impact on the availability or reliability of the 41,000 afy water transfer, which is a part of CLWA's SWP supplies.

2. Litigation Concerning The Adequacy Of The UWMPs For The CLWA Service Area

(a) Friends of the Santa Clara River v Castaic Lake Water Agency (2004) 123 Cal.App.4th 1 (*2000 UWMP* decision)

In the *2000 UWMP* decision, the Fifth District Court of Appeal invalidated the 2000 UWMP for the CLWA service area, because the Plan's description of perchlorate contamination failed to address the time needed to implement the available method for treating the contaminated water, and failed to describe the reliability of the groundwater supply during that implementation period.

In response to that decision, in 2005, CLWA and the retail water purveyors in the Santa Clarita Valley adopted the Amended 2000 UWMP and, in particular, the "Groundwater Perchlorate Contamination Amendment and Other Amendments."[6] The Amended 2000 UWMP addressed the time needed to implement the available method for treating the perchlorate-contaminated water in the local groundwater basin, and described the reliability of groundwater supplies during that treatment implementation period, as required by the Court of Appeal in the *2000 UWMP* decision. The Amended 2000 UWMP was never challenged in litigation.

(b) California Water Network, et al. v. Castaic Lake Water Agency, et al., Ventura County Superior Court No. CIV 23935 (*2005 UWMP* litigation)

In December 2005, as required by law, CLWA and the local retail purveyors adopted the new 2005 UWMP for the CLWA service area. Thereafter, in February 2006, two environmental groups filed a complaint to invalidate the 2005 UWMP litigation (*California Water Network, et al. v. Castaic Lake Water Agency, et al.*, Ventura County Superior Court No. CIV 23935). By stipulation, the parties agreed to transfer the 2005 UWMP litigation from Ventura County to the Los Angeles County Superior Court.

The main arguments presented in the 2005 UWMP litigation are that the 2005 UWMP overstates the reliability of both groundwater and surface water supplies, fails to provide an adequate discussion of perchlorate contamination, fails to adequately address the reliability of the 41,000 afy water transfer, relies on DWR's "flawed" model for predicting SWP deliveries, fails to address the effect of global warming and regulatory water quality controls on water deliveries from the SWP, and fails to identify the impact of private wells on the Santa Clarita River watershed.

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6 A copy of the "Groundwater Perchlorate Contamination Amendment and Other Amendments" is available for public inspection and review at Impact Sciences, Inc., 803 Camarillo Springs Road, Suite A-1, Camarillo, California 93012, and is incorporated by this reference.

On August 3, 2007, the Los Angeles County Superior Court upheld the adequacy of the 2005 UWMP.[7] In addressing the 2005 UWMP's consideration of the 41,000 afy water transfer, the court noted that all of the relevant facts, including pending litigation, were disclosed in the 2005 UWMP. The trial court further found that the 2005 UWMP identified substantial evidence supporting its determination that the 41,000 afy transfer was reliable in spite of the pending litigation, including evidence that: (i) the 41,000 afy transfer has been allocated and delivered since its creation; (ii) no court has enjoined the 41,000 afy transfer; (iii) the contracts memorializing the 41,000 afy transfer remain in "full force and effect."

Petitioners in the 2005 UWMP litigation have not yet filed an appeal. The County acknowledges that a legal challenge to the adequacy of the 2005 UWMP has been filed and creates some uncertainty, but the 2005 UWMP remains legally adequate despite the pending litigation, and there is no court order enjoining reliance upon the 2005 UWMP, or setting aside the 2005 UWMP at this time. In any case, the 2005 UWMP is required by law to be updated in 2010 or sooner, at the discretion of CLWA and the retail water purveyors in the Santa Clarita Valley. The updated plan is reasonably expected to continue to be a long-term water planning and management tool for use in the Santa Clarita Valley. As stated in the 2005 UWMP, "[w]ater management in California is not a matter of certainty, and planning projections may change in response to a number of factors." (2005 UWMP, p. 1-1.)[8]

3. Litigation Concerning the Semitropic Groundwater Storage Projects

(a) *California Water Impact Network, et al. v. Castaic Lake Water Agency*, **Ventura County Superior Court No. 215327**

In 2002, CLWA stored an available portion of its Table A Amount (24,000 acre-feet) in Semitropic Water Storage District's groundwater storage program. CLWA's approval of this groundwater storage project and the related negative declaration was challenged under CEQA in the Ventura County Superior Court (*California Water Impact Network, et al. v. Castaic Lake Water Agency, et al.*, Ventura County Superior Court No. 215327). After a hearing, the trial court entered judgment in favor of CLWA, finding that CLWA's approval of both the project and the negative declaration did not violate CEQA. Petitioners appealed that judgment to the Second District Court of Appeal (Division 6).

(b) *California Water Impact Network, et al. v. Castaic Lake Water Agency*, **Appellate Court 2d Civil No. B177978**

In an unpublished decision, dated March 23, 2006, the Second District Court of Appeal, Division 6, affirmed the Ventura County Superior Court judgment and rejected each of the arguments, challenging

7 The Superior Court's Statement of Decision in the 2005 UWMP litigation is found in **Appendix B** of this Final EIR.

8 A copy of the adopted 2005 UWMP is found in Appendix 4.10 of the Landmark Village Draft EIR.

the 2002 CLWA/Semitropic groundwater banking project. The Court of Appeal specifically rejected the following claims: (a) that CLWA was not the proper lead agency to prepare the CEQA analysis for the banking project; (b) that the perchlorate contamination would be spread by the project; (c) that the banking project would induce growth; (d) that the project would have significant air quality and other environmental impacts; (e) that the invalidation of the 2000 UWMP also invalidated the project; and (f) that the project approval violated the Public Trust Doctrine.[9]

In 2004, CLWA stored 32,522 acre-feet of available Table A Amount with Semitropic Water Storage District. No legal challenge was made to CLWA's approval of this project or to the negative declaration prepared under CEQA for the project.

In accordance with the terms of CLWA's storage agreements with Semitropic, 90 percent of the banked water, or a total of 50,870 acre-feet, is recoverable through 2013 to meet CLWA water demands in the Santa Clarita Valley when needed. Each account has a term of ten years for the water to be withdrawn and delivered to CLWA. CLWA plans to use this 50,870 acre-feet supply in dry years.

4. Litigation Concerning CLWA's EIR on the 2006/07 Water Acquisition Project

Comments have claimed that the Landmark Village Draft EIR's reference to CLWA's 2006/07 water acquisition from the Buena Vista Water Storage District and the Rosedale-Rio Bravo Water Storage District Water Banking and Recovery Program (Buena Vista-Rosedale) is misleading. (See, letter from California Water Impact Network, dated February 11, 2007, p. 2.) The discussion is not misleading.

The Landmark Village Draft EIR's cumulative water demand and supply analysis properly referenced Santa Clarita Valley planned water supplies as including the Buena Vista-Rosedale water acquisition. (See, e.g., Draft EIR, **Tables 4.10-13 - 4.10-17**.) This planned supply is reported in both the 2005 UWMP, and the recently released 2006 Santa Clarita Valley Water Report (May 2007).[10] In early 2007, CLWA finalized its water acquisition agreement with Buena Vista-Rosedale. Under this agreement, Buena Vista's high-flow Kern River entitlements (and other acquired waters that may become available) are captured and recharged within Rosedale-Rio Bravo's service area on an on-going basis. CLWA will receive 11,000 afy of these supplies through either exchange of Buena Vista's and Rosedale-Rio Bravo's SWP supplies or through direct delivery of banked water to the California Aqueduct via the Cross Valley

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9 A copy of the Second District Court of Appeal's unpublished decision is found in **Appendix B** of this Final EIR.

10 A copy of the 2006 Santa Clarita Valley Water Report is found in **Appendix B** of this Final EIR. The 2005 UWMP is already part of Appendix 4.10 of the Landmark Village Draft EIR.

Canal.[11] CLWA prepared and certified the Final EIR (SCH No. 2006091003) for this water acquisition project in October 2006.[12] On November 27, 2006, California Water Impact Network, petitioner, filed a petition for writ of mandate challenging CLWA's certification of the EIR for the project. The petition does not challenge the validity of CLWA's water acquisition agreement, and no court orders have been issued enjoining or otherwise affecting the agreement. As stated in this topical response, and in **Topical Response 4**: CLWA's 41,000 AFY Water Transfer, the mere filing of the litigation does not render the water acquisition agreement invalid, uncertain, or incapable of being relied upon as part of the planned water supplies for the Santa Clarita Valley.

Other comments assert that future development in the Santa Clarita Valley may be based on Article 21 water from DWR's long-term water supply contracts. (See, letter from California Water Impact Network, dated February 11, 2007, p. 2.) This is not correct. Water suppliers like CLWA and Valencia Water Company do not rely on the Article 21 provision of the SWP water supply contract as a primary source of water for new development.

5. Other Pending Statewide or Regional Litigation Matters

Comments have pointed to other recent court decisions and rulings, which the comments claim "compromise" the 41,000 afy water transfer and show there will be a "probable lack of sufficient water availability" for the Landmark Village project and the Santa Clarita Valley.

After an evaluation of other pending statewide or regional water-related litigation matters set forth below, and after having taken into account the potential uncertainty created by such litigation; nonetheless, substantial evidence exists to support the conclusion that the Landmark Village project does not rely on SWP supplies, CLWA's 41,000 afy SWP water transfer, or CVP supplies; instead, the project will use local groundwater and recycled water from the local Newhall Ranch WRP to meet the project's potable and non-potable water demand. In that context, and based on substantial evidence: (a) local water supplies for Landmark Village are sufficient to meet the project's potable and non-potable demands; and (b) the project will not contribute to any significant cumulative impacts on Santa Clarita Valley's water supplies, because Landmark Village is relying only upon local groundwater and recycled water to meet its potable and non-potable demands. Such supplies are both available and reliable to

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11 See, 2006 Santa Clarita Valley Water Report (May 2007), p. III-11-12. This water acquisition project is separate from CLWA's participation in the Rosedale-Rio Bravo Water Storage District Water Banking and Recovery Program (RRBWSD Water Bank), which underwent separate environmental review and was approved by the CLWA Board of Directors in October 2005.

12 The Final EIR is available for public inspection and review at CLWA, 27234 Bouquet Canyon Road, Santa Clarita, California 91350, and is incorporated by reference.

serve the Landmark Village project without relying upon CLWA's SWP supplies or the 41,000 afy water transfer.

(a) *In Re Bay-Delta Programmatic Environmental Impact Report Coordinated Proceedings* (2005) 133 Cal.App.4th 154 (also referred to as *Laub v. Davis*); review granted by the California Supreme Court

In response to concerns over the San Francisco Bay and the Sacramento-San Joaquin Delta (Bay-Delta), several federal and state agencies with management or regulatory responsibility over the Bay-Delta formed CALFED whose purpose is to devise a long-range plan to address water supply, water quality, ecological and other concerns of the Bay-Delta system. After years of study, analysis, and significant public participation, CALFED adopted a program to be administered over the next 30 years (the CALFED Program), which includes measures for improving the Bay-Delta ecosystem, water quantity and quality, and Delta levee stability. In 2000, the Secretary of the California Resources Agency certified the Final Program EIS/EIR, and CALFED adopted the record of decision (ROD) for the CALFED Program in accordance with NEPA and CEQA. Petitioners filed a petition for writ of mandate challenging the program EIS/EIR under CEQA and asserting various non-CEQA claims. The trial court found the Program EIS/EIR adequate under CEQA and dismissed the non-CEQA claims.

On appeal, petitioners challenged the trial court's ruling on numerous grounds. The Third District Court of Appeal rejected many of the petitioners' CEQA claims, but identified three areas where the EIS/EIR was inadequate. First, the appellate court held that the EIS/EIR erred by failing to identify the sources of water needed to carry out the CALFED Program activities. Second, although the appellate court generally rejected attacks on the EIS/EIR's alternatives analyses, it held that the EIS/EIR was flawed because none of the alternatives considered an alternative that called for reducing the export of water from the Delta to southern California. The record contained evidence supporting CALFED Program's premise that more water would have to be exported to southern California to accommodate anticipated population growth, particularly in light of the declining availability of Colorado River water and other supplies. CALFED rejected reduced-export alternatives because they were inconsistent with the project objective of meeting this demand. Nonetheless, the Court of Appeal found that the EIS/EIR should have included an alternative that assumed reduced water exports from the Bay-Delta region to southern California.

On November 15, 2005, the state Attorney General and others filed a petition for review with the California Supreme Court of the Court of Appeal decision. On January 25, 2006, the California Supreme Court granted review of the decision. As a result, the appellate court decision has been de-published. As such, the appellate court decision has no legal force and effect at this time. As of this writing, the case before the Supreme Court has been fully briefed and is awaiting oral argument.

Importantly, the comments also suggest that, in light of the appellate court decision, "it is imperative for CLWA to be cautious in reporting the SWP reliability." (See, letter from California Water Impact Network, dated February 11, 2007, p. 6.) However, the appellate court decision stated that the EIS/EIR should have considered an alternative calling for reduced water exports from the Bay-Delta to southern California; it did not suggest that this alternative was the one CALFED should have selected. It stated only that the alternative should have been included and analyzed in the EIS/EIR for those agencies actually making decisions based on the CALFED Program activities. The Court of Appeal did not render a decision as to the *reliability* of SWP supplies; and, in any case, because the Landmark Village project relies on local groundwater and recycled water from the Newhall Ranch WRP, the decision has no application to the project.

(b) State Water Resources Control Board Cases (2006) 136 Cal.App.4th 674 (*SWRCB* Cases)

Comments submitted on the Landmark Village Draft EIR state that the Third District Court of Appeal in the *SWRCB Cases*, "ordered that existing salinity standards" in the 1995 Bay-Delta Water Quality Control Plan (Bay-Delta Plan) "be upheld," which "means that more water must be left in the San Joaquin River and the Bay Delta and therefore there is less water to pump to southern California." (See, letter from California Water Impact Network, dated February 11, 2007, p. 4.) This case is not accurately characterized in the comments.

The *SWRCB Cases* include eight appeals and three cross-appeals in seven coordinated cases challenging various aspects of the State Water Resources Control Board's (State Board) 2000 Bay-Delta Water Rights Decision (Decision 1641). The 173-page decision is a comprehensive look at the Delta and the relationship between water quality and water rights as it applies to the Delta. Decision 1641 was the State Board's effort to implement the 1995 Bay-Delta Plan. In Decision 1641, the State Board sought to allocate responsibility among various water rights holders for meeting the water quality objectives in the 1995 Bay-Delta Plan. Decision 1641 assigned much of that responsibility to the Central Valley Project (CVP), operated by the U.S. Bureau of Reclamation (Bureau), and the SWP, operated by DWR. Decision 1641 also dealt with two separate petitions filed by the Bureau and DWR.

Several lawsuits were filed challenging various aspects of Decision 1641. Plaintiffs in the *SWRCB Cases* included water districts in the Central Valley and the San Francisco Bay Area that use exported Delta water, Delta exporter groups, water districts within the Delta, and environmental groups. The cases were consolidated before the Sacramento County Superior Court. In 2003, the trial court issued its decision upholding Decision 1641 in all but two respects. The eight appeals and three cross-appeals followed.

On the issue of salinity standards, the 1995 Bay-Delta Plan required that implementation of the salinity objectives be achieved by a date certain. However, the State Board authorized delayed implementation of the salinity objectives, despite the fact that there was nothing in the 1995 Bay-Delta Plan that allowed the Board to do so. The appellate court found that by "taking these actions, the Board failed to adequately implement the 1995 Bay-Delta Plan and instead effectively amended the 1995 Bay-Delta Plan without complying with the procedural requirements for amending a water quality control plan." Id. at 734-735. Consequently, the appellate court ordered that the "Board must either fully implement the southern Delta salinity objectives as set forth in the 1995 Bay-Delta Plan or must duly amend the plan." Id. at 735.

Thus, it does not follow, as the comment letters suggest, that this ruling will necessarily lead to less water available for import to southern California. The appellate court simply required the State Board to comply with the objectives as set out in the Bay-Delta Plan, *or* to follow the appropriate procedure for amending the Bay-Delta Plan. Further, the appellate court agreed that the Board was not required to tell the Bureau and DWR exactly *how* they were to meet the salinity objectives. Id. at 734. (Meeting salinity standards may be achieved in numerous ways, including construction of barriers, and is not limited to regulating pumping; see discussion below regarding SWRCB Order WR 2006-0006.)

Therefore, although it is possible that meeting the salinity requirements could lead to less water being available if the Bureau and DWR were to employ decreased pumping in order to achieve the salinity objectives, the appellate court did not make a determination on this issue. In addition, the appellate court left it to the State Board's discretion to amend the salinity objectives set forth in the Bay-Delta Plan, in which case the Bureau and DWR would not be required to meet the Plan's existing salinity objectives.

The case arguably has the potential to affect the amount of water exported from the Bay-Delta to southern California, although nothing in the decision does that at this time. As a result, the County finds that the Landmark Village Draft EIR's use of DWR's supply estimates for SWP water in wet, average, and dry years represent the best available information for use in a project-level EIR at this time.

(c) State Water Resources Control Board Order WR 2006-0006

Comments submitted on the Landmark Village EIR state that the SWRCB Order WR 2006-0006 issued on February 15, 2006, soon after the Third District Court of Appeal decision in the *SWRCB Cases*, requires "DWR and the CVP to shut down their pumps if the salinity standards are not met which means that more water must be left in the San Joaquin River and the Bay Delta and therefore there is less water pumped to southern California." (See, letter from California Water Impact Network, dated February 11, 2007, p. 4.) The comments do not accurately characterize the SWRCB Order.

In SWRCB Order WR 2006-0006, the State Board issued a cease and desist order requiring the DWR and Bureau to take corrective action under a time schedule to correct threatened violations of their permits and license. *SWRCB Order*, p. 1. Their permits and license require DWR and the Bureau to meet salinity objectives at three locations in the southern Delta between April 1 and August 31 of each year. Id., p. 2. Starting April 2006, the State Board is now requiring DWR and the Bureau to meet the adopted salinity standards set forth in Decision 1641, but not immediately. Instead, it allows the two agencies until July 1, 2009, to meet the adopted salinity objectives. Id., p. 28-29. This is the date by which the agencies now predict completion of a "permanent barriers project or equivalent measures" that will enable the agencies to meet the salinity objectives. In the interim, the two agencies are required to provide the State Board with a detailed plan and schedule for compliance with the conditions set forth in the Order. Id., p. 29-30.

In the event that DWR or the Bureau project a potential exceedance in the salinity objectives prior to July 1, 2009, the two agencies are required to immediately inform the State Board of the potential exceedance, and describe the corrective actions they are initiating to avoid the exceedance. Id., p. 30. The "corrective actions" may include, but are not limited to "additional releases from upstream [CVP] facilities or south of the Delta [SWP] or CVP facilities, modification in the timing of releases from Project facilities, reduction in exports, recirculation of water through the San Joaquin River, purchases or exchanges of water under transfers from other entities, modified operations of temporary barriers, reductions in highly saline drainage from upstream sources, or alternative supplies to Delta farmers (including overland supplies)." Id.

In response to comments, the State Board determined that DWR and the Bureau were partially responsible for the salinity problems at certain locations because of export pumping. Decision 1641, which allocated the responsibility for implementing the salinity objectives of the 1995 Bay-Delta Plan, noted that the implementation of a "barrier program" could help improve salinity concentrations and that DWR and the Bureau were working together on such a program. (*State Water Resources Control Board Cases* (2006) 136 Cal.App.4th 674, 711.) To the extent that comments on the Landmark Village Draft EIR infer that meeting the salinity objectives will necessarily result in less water to pump to southern California, such an assumption is not accurate because it assumes that the only way to control salinity is to reduce export pumping. While the reduction of exports is listed as one means of improving salinity concentrations, it is only one of many such methods. As noted above, implementation of a barrier program is another means for improving salinity concentrations and, in fact, DWR and the Bureau are working on such a program. In addition, the Order itself emphasizes that constructing permanent barriers is not the exclusive method for compliance with the salinity objectives, and that additional potential corrective actions to avoid potential exceedance of the salinity objectives include actions such as additional releases from upstream CVP facilities or south of the Delta SWP or CVP facilities,

modifications in the timing of releases from Project facilities, reduction in exports, purchases or exchanges of water under transfers from other entities, modified operations of temporary barriers, and several other options. Id. pp. 23, 30.

Thus, the assertion in comments that DWR and the Bureau must "shut down their pumps if the salinity standards are not met" is not accurate. The State Board's amended approval of the "Water Quality Response Plan" (WQRP) requires that DWR and the Bureau be in compliance with the conditions contained in their permits and license, including salinity objectives, in order to enable "joint points of diversion" (JPOD) operations, and orders that JPOD operations must cease if such conditions are not met. Hence, if the salinity objectives are not met, DWR and the Bureau may not conduct JPOD operations. However, this means that they are only restricted from use of *one another's* facilities - they are not restricted from using their *own* facilities. As such, DWR and the Bureau are not being ordered to "shut down their pumps." Id., pp. 25, 32-33.

As to the Board's Order that DWR and the Bureau take corrective actions under a time schedule to correct threatened violations of their permits and license in order to meet the salinity objectives, it is true that a complete failure to meet the salinity requirements by the time schedule (July 1, 2009) could result in further action by the Board. However, the Order encourages communication by requiring DWR and the Bureau to submit plans and schedules detailing how DWR and the Bureau intend to meet the objectives, periodic updates and progress reports, and notification to the Board if DWR and the Bureau anticipate a potential exceedance of the salinity objectives, or if an exceedance has occurred. Id., p. 29-31. The Order states that in the event of an exceedance, the Executive Director will *make a recommendation* to the State Board *regarding whether to take enforcement action.* Id., p. 30. In deciding *whether* to initiate enforcement action, the Executive Director must consider the extent to which the non-compliance was beyond DWR's or the Bureau's control and the actions taken to correct the exceedance. Id.

Lastly, the Order provides that upon the failure of any person to comply with the requirements contained in the Order (by July 1, 2009), the State Board may request the Attorney General to petition the Superior Court for injunctive relief, as appropriate. Id., pp. 28-32. The State Board also may issue monetary fines. Id., p. 32. However, nowhere does the Order mandate that DWR and the Bureau shut down their pumps.

(d) Natural Resources Defense Council v. Rodgers 381 F.Supp.2d 1212 (E.D. Cal. 2005) (*Rodgers* decision)

Comments submitted on the Landmark Village Draft EIR state that the *Rodgers* decision shows there is "paper water" associated with CVP water supplies. (See, letter from California Water Impact Network, dated February 11, 2007, p. 6.) These comments do not appear to summarize fairly or accurately the pertinent portions of the *Rodgers* decision. Nor do the comments make an attempt to explain the

connection between the *Rodgers* decision and Santa Clarita Valley water supplies, including the 41,000 afy water transfer.

In the *Rodgers* decision, plaintiff, an environmental organization, brought an action against the Bureau, U.S. Fish and Wildlife Service (USFWS), and another federal agency, alleging that, under the federal Endangered Species Act (ESA), the agencies failed to examine critical issues in biological opinions before the Bureau executed the renewal of long-term water supply contracts for delivery of CVP water to various irrigation and water districts.

The *Rodgers* decision contains no reference to or discussion of SWP supplies. The comments also do not explain how this ESA action involving CVP water supplies, which are not used as a water source for the Santa Clarita Valley, could be applicable to the Landmark Village project. In fact, the *Rodgers* decision does not apply to the proposed Landmark Village project.

***(e) Planning and Conservation League v. United States Bureau of Reclamation,* U.S. District Court, Northern District of California, Case No. C 05-3527 CW *(PCL/Bureau* decision)**

Use of the *PCL/Bureau* Decision in Comments

Comments submitted on the Landmark Village Draft EIR state that the CalSim-II computer model is flawed, and provide articles and other attachments that are critical of DWR's use of the CalSim-II model, pointing out that "[a]ll of [the] documents [provided] clearly lay out the problems for anyone who wants to rely on CalSim II as the predictor of reliability for the SWP." (See, letter from California Water Impact Network, dated February 11, 2007, p. 5.) Although not referred to in the comment letters, other comments submitted by the same organization have criticized DWR's reliance upon the CalSim-II model, claiming that the model overstates the amount of water the SWP can deliver during average and dry years. The criticisms leveled against DWR's CalSim-II model are noted, including the criticisms found in the following documents:

(a) *A Strategic Review Of CALSIM II And Its Use For Water Planning, Management And Operations In Central California*, submitted to the California Bay-Delta Authority Science Program Association of Bay Governments, by A. Close, *et al.*, dated December 4, 2003;

(b) *Musings On A Model: CalSim II In California's Water Community*, San Francisco Estuary and Watershed Science, Vol. 3, Issue 1 (March 2005), Article 1, by Inês C. Ferreira, *et al.*;

(c) *An Environmental Review Of CalSim II: Defining "Full Environmental Compliance" And "Environmentally Preferred" Formulations Of The CalSim II Model*, by Jeffrey T. Payne, *et al.*, dated November 2005;

(d) *Gerald Johns' Memo*, prepared by Jan de Leeuw, dated October 23, 2005; and

(e) *On The Adequacy Of CALSIM II For Environmental Impact Analysis And SWP Reliability Analysis*, prepared by Arve R. Sjovold, dated August 12, 2004; and *Some Insights On Water Deliveries To Settlement Contractors*, prepared by Arve R. Sjovold, dated October 24, 2004.

Like any computer model, CalSim-II is subject to criticism, but DWR still views CalSim-II as a generally well-rated and accurate model for California's two largest water projects, CVP and SWP. DWR has explained that:

> "CALSIM II is a general water resources planning software developed by DWR. CALSIM II, developed through a collaborative effort by DWR and Reclamation, represents a comprehensive simulation of the SWP and CVP. . . . [¶] CALSIM II provides a reasonable planning level simulation of existing project operations, recognizing that the operating environment and regulatory requirements for the projects are in a constant state of transition and change. Since CALSIM II is not a detailed operations model, it does not capture many of the complexities of forecasted and actual operations of project facilities. In determining the suitability of these studies to a particular analysis, the user should consult all documentation that accompanies this release and the [Technical Coordination Team] and [Benchmark Study Team] as appropriate."[13]

One of the above articles[14] states that:

> "The CalSim II model is the most prominent water management model in California, and has become central to a variety of water management and policy issues and controversies. . . . CalSim II is a complex model of a complex part of California's changing multi-purpose water system. As such, analytical controversies and misunderstandings are inevitable. . . . While CalSim II is generally seen as a significant improvement over previous models, a wide variety of ideas are suggested for improvements."

The CalSim-II model, like other computer models, contains several perceived strengths as well as weaknesses, several of which were noted in the article, *A Strategic Review Of CALSIM II And Its Use For Water Planning, Management And Operations In Central California*, by A. Close, *et al.*, dated December 4, 2003, pp. 6-9. It also is acknowledged that CalSim-II is not a perfect model. Indeed, no computer model is perfect. However, on balance, and after considering the various articles criticizing the CalSim-II model, DWR's determination that CalSim-II is a "useful and appropriate tool for assessing the delivery capability of the SWP" is considered reasonable.[15] In addition, despite criticisms of CalSim-II, it is still appropriate

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13 See, http://modeling.water.ca.gov/hydro/studies/Version2_Benchmark.html; see also "CalSim II: Simulation of Historical SWP-CVP Operations," Technical Memorandum, Department of Water Resources, Bay-Delta Office, November 2003. Copies of the website materials and technical memorandum are found in **Appendix B** of this Final EIR.

14 *Musings On A Model: CalSim II In California's Water Community*, San Francisco Estuary and Watershed Science, Vol. 3, Issue 1 (March 2005), Article 1, by Inês C. Ferreira, *et al*. Please refer to **Appendix B** of this Final EIR.

15 For a copy of the DWR letter to Mindy McIntyre, Planning and Conservation League, dated April 20, 2006, please refer to **Appendix B** of this Final EIR.

to rely on DWR for information based on the CalSim-II model, unless and until a new or updated model is known to exist and available for use.

The *PCL/Bureau* Decision

As stated above, comments rely on the *PCL/Bureau* decision to support the claim that SWP delivery reliability is suspect. The comments do not properly characterize the *PCL/Bureau* decision.

In the *PCL/Bureau* decision, the federal court issued an order granting plaintiff's motion for a preliminary injunction on February 15, 2006, which has enjoined construction of the "Intertie" project until the case is decided on the merits. (The Intertie project is a proposed pipeline project that would connect the main delivery canals of two water diversion projects, the federal CVP and the state SWP, in California's Central Valley. The proposed pipeline is known as the "Delta-Mendota Canal/California Aqueduct Intertie." At issue is the Bureau's decision to rely on an Environmental Assessment/Negative Declaration for environmental review of the Intertie project under both NEPA and CEQA *in lieu* of an EIS/EIR.)

In granting the preliminary injunction, the federal court stated that its reasoning was explained in an earlier court order granting plaintiff's application for a temporary restraining order issued on February 3, 2006. In that February 3, 2006 Order, the court addressed plaintiff's claim that an EIS/EIR was required for the Intertie project because the existing environmental documents that found no significant impacts were based on CalSim-II modeling, which, according to plaintiff, was "too unreliable to rule out the potential for significant impacts." Order, p. 9.[16] In response to that claim, the federal court did not appear concerned with the perceived shortcomings of the model, but rather the Bureau's failure to *disclose* the shortcomings. In fact, the court specifically stated that the use of CalSim-II "alone does not show that Defendant [Bureau] was arbitrary and capricious in reaching its finding of no significant impact." Id. At 11.

In short, the federal court did not prohibit the Bureau or any other agency from using or relying on the CalSim-II model, but rather, stated that the Bureau could rely on the model, provided it disclosed relevant shortcomings in the data or model itself, citing *Lands Counsel v. Forester of Region One of the U.S. Forest Service*, 395 F.3d 1019, 1032 (9th Cir. 2004) (finding that non-disclosure of relevant shortcomings in model violated NEPA). *Compare*, *Sierra Club v. Castle*, 657 F.2d 298, 332 (D.C. Cir. 1981) (upholding EPA's reliance on modeling because it provided necessary disclosure). Here, based on a review of the above reports, the known and perceived shortcomings with DWR's CalSim-II model are understood; nonetheless, substantial evidence supports the conclusion that the CalSim-II model remains the best

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16 For a copy of the federal court's "Order Granting Plaintiff's Application for Temporary Restraining Order," dated February 3, 2006, including the federal court's later "Order Granting Plaintiff's Motion for Preliminary Injunction," dated February 15, 2006, please refer to **Appendix B** of the Landmark Village Final EIR.

available data for assessing SWP operations and constraints. And, in any case, the adequacy of the CalSim-II modeling is not applicable to the Landmark Village project, because the project relies upon local groundwater supplies and recycled water from the Newhall Ranch WRP to meet its potable and non-potable water demands – it does not rely on SWP supplies provided by CLWA.

(f) *Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho Cordova* (2007) 40 Cal.4th 412 ("*Vineyard* Decision")

In *Vineyard*, a decision addressing CEQA and water supply analysis for major development projects, the California Supreme Court held that the EIR for a Community Plan contained an adequate analysis of near-term water supplies; however, the EIR did not provide an adequate analysis of long-term supplies needed to serve the Community Plan, together with other anticipated development in the area.

In the case, landowners proposed to develop 6,000 acres in Sacramento County. The Community Plan proposed 22,000 residential units, as well as office, industrial and public uses. The landowners also proposed a Specific Plan, encompassing 2,600 acres and 9,886 residential units, to be developed as the first phase of development within the Community Plan. The County prepared an EIR analyzing the impacts of implementing both plans, and certified the EIR and approved the plans. Project opponents brought a petition for writ of mandate on a variety of grounds to overturn the County's certification of the EIR and approval of the project. The trial court and Court of Appeal denied the petitions. The Supreme Court granted the petition for review to address, among other issues, the adequacy of the EIR's water supply analysis. (Id., p. 421.)

The Supreme Court's discussion of the County's water supply analysis focused on two distinct aspects of the EIR: (1) the analysis of near-term water supplies needed to serve the Specific Plan, and (2) the analysis of long-term supplies necessary for the entire Community Plan. (Id.)

To serve the initial phase of the project (i.e., the Specific Plan), the EIR stated that the project would rely on a newly developed "well field" located near the project area. This well field could safely yield up to 10,000 acre-feet per year (afy). The Sacramento County Water Agency would make this water available on a first-come-first-served basis to the project, and to other anticipated development in the area. The record showed this new well field would initially be connected solely to a particular area, but the landowners agreed to pay a fee to compensate any nearby well owners harmed by pumping; and other near-term development would require only 3,000 afy, leaving the balance, 7,000 afy, to meet the anticipated demand of 5,500 afy for the Specific Plan. (Id., p. 436-437.) Thus, the Court observed, "*[w]hile much uncertainty remains*, . . . the record contains substantial evidence demonstrating a *reasonable likelihood* that a water source the provider plans to use for the . . . project . . . will indeed be available at least in substantial part to supply the . . . project's near-term needs." (Id., p. 437, italics added.) The EIR did not

defer analysis of the impacts of developing these supplies, or rely on illusory supplies. (Id.) And, to the extent anticipated water supplies did not materialize, or the agency proposed new or different supplies, the agency could conduct supplemental analysis to address changes to the project or its circumstances. (Id., p. 438.)

With respect to long-term water supplies intended to serve the Community Plan as a whole, the Court found that the record contained substantial evidence supporting the County's conclusion that up to 15,000 afy in new surface water diversions from the American River (i.e., "Fazio water") would be available to serve the project. The problem, however, was that the Final EIR's discussion of total long-term water supply and demand in the broader region left "too great a degree of uncertainty regarding the long-term availability of water for this project. Factual inconsistencies and lack of clarity in the FEIR leave the reader -- and the decision makers -- without substantial evidence for concluding that sufficient water is, in fact, likely to be available for the . . . project at full build out." (Id., p. 439.)

The EIR's analysis stated that long-term water demand in "Zone 40" (within the Community Plan) would be approximately 113,000 afy at build-out of the General Plan. Another EIR prepared to analyze the impacts of increased diversions from the American River, the "Water Forum EIR," had estimated Zone 40 demand at 87,000 afy at build-out. The project EIR did not explain the reason for the discrepancy in water demand. (Id., p. 439.)

On the supply side, the Final EIR stated that surface water deliveries would total roughly 64,000 afy; elsewhere, the same EIR estimated new surface water deliveries at 45,000 afy. The Water Forum EIR stated that up to 78,000 afy in new surface water would become available. (Id.) Again, the Final EIR did not explain why these numbers differed. In adopting findings approving the Community Plan, the County used the Final EIR's estimated demand of 113,000 afy and estimated surface water supply of approximately 64,000, but did not explain the differing estimates. Although such an explanation might have existed, it did not appear in the Final EIR. (Id., p. 439-440.)

Nor did the Final EIR explain how this gap, 113,000 afy in Zone 40 demand, and approximately 64,000 afy in new surface water supplies, would be bridged. When comments pointed out this gap, the Final EIR responded that "new surface water supplies are to be used conjunctively with groundwater supplies." (Id., p. 440.) This explanation, however, was too "vague and unquantified" to be relied upon, because it did not explain how groundwater and surface water would be managed during wet and dry years to bring long-term demand and supply into balance. (Id.)

The Final EIR stated a full analysis of the conjunctive use program would be included in a future environmental analysis prepared for the Water Agency's Zone 40 Master Plan Update, which was

pending at the time the County released the Final EIR. (Id.) The Court rejected this approach, stating that the County could not avoid its obligation to analyze the likely water sources for the Community Plan, by stating that the analysis would be provided in a *future* environmental document. (Id., p. 440–441.)

In analyzing long-term water supplies, the California Supreme Court noted that the County did not need to demonstrate with certainty that the total anticipated water supply would be sufficient to meet total demand at build-out. (Id., p. 441.) "But CEQA did require that the FEIR show a *likelihood* water would be available, over the long term, for this project. Without an explanation that shows at least an approximate long-term sufficiency in total supply, the public and decision makers could have no confidence that the identified sources were actually likely to fully serve this extraordinarily large development project." (Id., p. 441, italics in original.)

The Court's Four Principles Governing CEQA Analysis of Water Supply

In reaching its decision, the California Supreme Court discussed several published appellate court decisions addressing water supplies, found that they did not state a "definitive standard of certainty for analysis of future water supplies," but did agree that the decisions articulated four "principles" for "analytical adequacy" of an EIR under CEQA. (Id., p. 430.) These four principles are discussed further below in order to assist readers and the decision makers in answering questions about the sufficiency of an EIR's analysis of water supplies. Specifically, the California Supreme Court framed the principal question as follows: "[H]ow firmly future water supplies for a proposed project must be identified or, to put the question in reverse, what level of uncertainty regarding the availability of water supplies can be tolerated in an EIR for a land use plan." (Id. p. 428.)

The first principle is that an EIR does not satisfy CEQA's informational purposes if it "simply ignores or assumes a solution to the problem of supplying water to a proposed land use project." (Id., p. 431.) In this regard, the Supreme Court stated that decision makers must be presented with sufficient facts to evaluate the "pros and cons" of supplying the amount of water that the project will need. (Id.)

The second principle is that an adequate EIR for a large project, to be constructed over a number of years, cannot be limited to the water supply needed for the "first stage or the first few years" of the project. (Id., p. 431.) In this respect, the Supreme Court stated that the EIR "must assume that all phases of the project will eventually be built and will need water, and must analyze, *to the extent reasonably possible*, impacts of providing water to the entire proposed project." (Id., italics added.)

As to the third principle, the Supreme Court stated that the EIR's identified and analyzed future water supplies "must bear a *likelihood* of actually proving [to be] available" and that "speculative sources and

unrealistic allocations ('paper water') are insufficient bases for decisionmaking under CEQA." (Id., p. 432.) The Supreme Court stated that the EIR must "address the impacts of *likely* future water sources . . . includ[ing] a reasoned analysis of the circumstances affecting the likelihood of the water's availability." (Id., italics added.)

As to the fourth principle, the Supreme Court stated that "where, despite a full discussion, it is *impossible* to confidently determine that anticipated future water sources will be available," then and only then does CEQA require "some discussion of possible replacement sources or alternatives to use of the anticipated water, and of the environmental consequences of those contingencies." (Id., p. 432, italics added.)

Finally, the Supreme Court found it "significant" that none of the published appellate court decisions "holds or suggests that an EIR for a land use plan is inadequate unless it demonstrates that the project is definitively assured water through signed, enforceable agreements with a provider and already built or approved treatment facilities." (Id., p. 432.) The Supreme Court stated that requiring such certainty for a long-term, large-scale project would "likely be unworkable, as it would require water planning to far outpace land use planning." (Id.)

Application of the Four Principles Governing CEQA Analysis of Water Supply

As to the first principle, that an EIR analyze the impacts of supplying water needed for a proposed project, and not simply "ignore[] or assume[] a solution to the problem of supplying water" (*Vineyard*, p. 431), the Landmark Village Draft EIR makes it clear that the Landmark Village potable water demand (702 afy) would be met through the use of the project applicant's rights to 7,038 afy of groundwater from the local Alluvial aquifer, which is presently used by the applicant for agricultural irrigation. The project's non-potable water demand (336 afy) would be met through the use of recycled water from local water reclamation plants (with the Newhall Ranch WRP being the preferred option). In summary, then, the Landmark Village project's water demand would be met by two primary sources of water supply, namely, the applicant's local agricultural water supplies and recycled water supplied by local reclamation plants. Because these two independent water sources meet the water needs of the proposed Landmark Village project, no potable water would be needed from the existing or planned water supplies of CLWA, including SWP supplies. Nonetheless, for information purposes, the Landmark Village EIR contains an extensive discussion of the project's water supplies, and it includes information concerning CLWA's SWP supplies, along with an assessment of the 41,000 afy water transfer.[17] The Landmark Village Final EIR also responds to claims that the 41,000 afy water transfer is too uncertain to be relied upon as a water source for the Santa Clarita Valley. (See, **Topical Response 4**: CLWA's 41,000 AFY Water Transfer.) That

[17] See, Draft EIR, Section 4.10, pp. 4.10-1–4.10-51, 4.10-57–4.10-92; and see, pp. 4.10-52–4.10-57.

response evaluates the "pros and cons" of relying upon the 41,000 afy water transfer as a water source for the Santa Clarita Valley as a whole. On the "positive" side, that discussion includes, among other topics:

- historical discussion of the Monterey Amendments based on which CLWA entered into a contract with DWR to purchase for approximately $47,000,000 the 41,000 afy water transfer;
- discussions of DWR's allocation of water to CLWA based on the 41,000 afy water transfer and of the amount of water actually delivered to CLWA since 2000 based on that transfer;
- discussion of CLWA's preparation of its 2004 EIR and the current legal status of that EIR;
- discussions of the amount of SWP water that DWR has estimated can reliably be delivered to its water contractors, including CLWA, in the future and the amounts that have been delivered in the past; and
- CLWA's and the other water purveyors' plans for future additional supplies.

On the "negative" side, that discussion highlights:

- the litigation challenging the initial EIR for the Monterey Amendments, the Planning and Conservation League's litigation before the Sacramento County Superior Court, including the existence and effect of the Monterey Settlement Agreement entered in the PCL Litigation and that Agreement's treatment of the 41,000 afy water transfer;
- the litigation in the Los Angeles County Superior Court by Friends of the Santa Clara River challenging CLWA's first EIR for its purchase of the 41,000 afy water transfer, and the more recent Chalfant Decision setting aside CLWA's 2004 EIR until one defect is corrected, but otherwise finding that the EIR was properly prepared; and
- The pending appeal of the Chalfant Decision.

After having considered all of this information—the pros and the cons—the County has concluded that the Santa Clarita Valley can rely on the 41,000 afy water transfer for planning purposes. This is the analysis that provides the substantial evidence the *California Oak* decision requires where a lead agency decides, in its discretion, to rely on the 41,000 afy water transfer. (*California Oak*, *supra*, 133 Cal.App.4th at p. 1238.) Again, however, it bears repeating that the proposed Landmark Village project does not rely on SWP supplies. Instead, the project will use local groundwater and recycled water to meet its water demand.

As to the second principle, that an EIR analyze the impacts of supplying the water needed by a project, and not defer that analysis to a future environmental document *(Vineyard*, p. 431), the Landmark Village EIR contains a thorough analysis of the impacts of supplying Landmark Village with the water it needs. Specifically, Landmark Village's projected total water demand is 1,038 afy in a normal/average year. Project water demand increases by approximately 10 percent in a dry year to a total of 1,142 afy. To meet

this demand, Valencia Water Company, as the local retail purveyor, would provide the water needed to serve the Landmark Village project. The water sources that would serve the proposed project are the applicant's agricultural water from the local Alluvial aquifer, which will be treated and used to meet the project's potable demand, and recycled water from local water reclamation plants (and most likely the Newhall Ranch WRP), which will be used to meet the project's non-potable demand.

Based on the data presented in the Landmark Village EIR, the local Alluvial aquifer can meet the groundwater demands of the Santa Clarita Valley, including the Newhall Ranch Specific Plan (and the Landmark Village project) without creating any significant groundwater impacts. The quality of the groundwater available from the Alluvial aquifer near the Landmark Village project site has been tested, and the testing indicates that all constituents tested were at acceptable levels for drinking water. In short, the Landmark Village Draft EIR does not "defer" the analysis of water supplies needed to serve the Landmark Village project site.

As to the third principle, that the identified and analyzed future water supplies on which an EIR relies bear "a *likelihood* of actually proving available," that "speculative sources and unrealistic allocations ('paper water') are insufficient bases for decisionmaking under CEQA," (*Vineyard*, p. 432, italics added), the Landmark Village EIR fulfills these requirements. As stated above, the Landmark Village project will use local groundwater and recycled water to satisfy its potable and non-potable water demand. These local supplies are readily available from the local groundwater basin, and from approved and existing water reclamation plants (either the existing Valencia WRP or the approved Newhall Ranch WRP). There also is nothing speculative about these local supplies. To meet the project's potable demand, the applicant will utilize its rights to the 7,038 afy of groundwater from the Alluvial aquifer, which has been historically used, and is continuing to be used, by the applicant for agricultural irrigation. The meet the project's non-potable demand, recycled water will be used from the initial phase of the approved Newhall Ranch WRP, with build-out of the plant occurring over time as demand for treatment increases with implementation of the project. Alternatively, if the Newhall Ranch WRP is not operating at the time of project occupancy, the non-potable water demand would be met through the use of recycled water from the existing Valencia WRP, located upstream of the Landmark Village project site.

The fourth principle articulated by the Supreme Court is that where, despite a full discussion, it is "impossible" for the EIR to confidently determine that anticipated future water sources will be available, then the EIR is required to contain "some discussion" of possible replacement or alternative sources for the anticipated water, and of the environmental consequences of those contingent water sources. (*Vineyard*, p. 432.) The Landmark Village EIR, Section 4.10, Water Service, makes it clear that the expected water sources to meet the Landmark Village project's potable and non-potable water demand are readily available local water supplies (i.e., local groundwater and recycled water).

In short, unlike the long-term water supply in *Vineyard*, *supra*, here, the Landmark Village EIR identifies and analyzes all of the water supplies needed to serve the project. And, there are no uncertainties in those supplies that would make it "impossible" for the County to confidently determine that the water sources needed to serve Landmark Village will be available. Here, there is no uncertainty as to Landmark Village's potable and non-potable water supplies (i.e., groundwater and recycled water).

(g) ***Watershed Enforcers, et al. v. California Department of Water Resources, et al.***
Alameda County Superior Court No. RG06292124 ("*Watershed* Decision")

In October 2006, plaintiff, Watershed Enforcers, a project of the California Sportfishing Protection Alliance, filed a lawsuit in Alameda County Superior Court alleging that DWR was not in compliance with the California Endangered Species Act (CESA) and did not have the required state incidental take permit to protect the Delta smelt as part of DWR's pumping operations at the Harvey O. Banks Pumping Plant located near the town of Tracy. In April 2007, the court agreed with the plaintiff and ordered a shutdown of pumping from the Delta if appropriate permits could not be obtained in 60 days. In May 2007, DWR filed an appeal of the trial court's decision, which automatically stayed that decision pending the outcome of the appeal. At the same time, DWR entered into a Memorandum of Understanding with CDFG to jointly work with the appropriate federal agencies to develop a federal biological opinion that complies with CESA. During preparation of the new biological opinion, DWR committed itself to actions related to protecting the Delta smelt and other species through the adaptive management provisions of the existing biological opinions. Upon completion of this effort, DWR plans to submit a request to CDFG for a consistency determination under CESA that would allow for incidental take based on the new federal biological opinion.

(h) ***Natural Resources Defense Council, et al. v. Kempthorne, et al.***
U.S. District Court, Eastern District of California
Case No. 05 CV 01207 OWW ("*Wanger* Decision")

On February 16, 2005, the USFWS issued its biological opinion, determining that the operations, plan, and criteria for both the CVP and SWP would not result in jeopardy to the delta smelt, a listed species. On May 20, 2005, the Natural Resources Defense Council (NRDC) and others filed a supplemental complaint in federal court against the Secretary of the Interior and the Director of USFWS, challenging the adequacy of the 2005 biological opinion. On June 9, 2006, plaintiffs filed their motion for summary judgment. On July 6, 2006, in light of new information, the U.S. Bureau of Reclamation (Bureau), operator of CVP, requested that USFWS reinitiate consultation on the operations plan and criteria for the CVP. Notwithstanding the request for reinitiation of consultation, the parties proceeded with briefing their cross-motions for summary judgment and, on May 25, 2007, the U.S. District Court for the Eastern

District, the Honorable Oliver W. Wanger, presiding, found that the 2005 biological opinion was inadequate and that the no-jeopardy determination was arbitrary, capricious, and contrary to the law.[18]

On June 1, 2007, Judge Wanger further ordered USFWS and DWR to submit briefing and proposals on interim remedies "to be in effect until such time as the [Service] issues a new biological opinion." (Scheduling Order, Docket No. 392 (June 29, 2007), at p. 2.) The USFWS and the Bureau have reinitiated consultation, and currently expect to complete a new biological opinion by late summer or early fall of 2008.

On July 9, 2007, USFWS and DWR submitted the requested briefing addressing proposed interim remedies to be in effect until issuance of the new biological opinion. Both agencies have been working together, along with the Bureau, toward the development of a new federal biological opinion. The new biological opinion also is expected to allow CDFG to render "consistency" determinations under CESA requirements.

On August 31, 2007, Judge Wanger announced interim remedies that are expected to restrict operations of the pumps that supply water from the Bay-Delta through both the CVP and SWP. The interim remedies are expected to be in place until a new biological opinion is issued in the summer or fall of 2008. The proposed interim remedies are complex and affect both the CVP and SWP water projects, and involve limits on the amount of water that is taken from the Bay-Delta. At this time, the interim remedies have not yet been memorialized in a signed order issued by Judge Wanger. The parties are in the process of preparing the proposed order for review and approval by Judge Wanger.

Implications of the *Watershed* and *Wanger* Decisions

In terms of short-term water supply availability, there have been short-term effects related to issues presented in the *Watershed* and Wanger Decisions. For example, pumping operations were shut down for approximately nine days in June 2007 due to concerns over the declining number of Delta smelt. DWR then operated the pumps at limited levels for several weeks while waiting for the smelt to migrate to cooler waters. DWR then resumed normal operations in July 2007. There also is concern that the remedy adopted by the District Court could ultimately become part of the conditions in the new incidental take permit expected to be issued in the late summer or early fall of 2008. These concerns, if they materialize, could limit the percentage of SWP water that can be delivered to SWP Contractors, including CLWA. If such remedies are not ultimately part of the incidental take permit, the permit itself may contain conditions that would lower the percentage of SWP water made available for delivery to Southern California, including the Santa Clarita Valley.

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18 The Wanger Decision is found in **Appendix B** of this Final EIR.

However, precisely because of these concerns, Governor Schwarzenegger directed DWR to take immediate action to improve conditions in the Delta.[19] According to the Office of the Governor, the Governor is building on his Strategic Growth Plan from last year, which consists of approximately $6 billion to upgrade California's water systems. The Governor's plan invests $4.5 billion to develop additional surface and groundwater storage. The plan also includes $1 billion toward restoration of the Delta, including development of a new conveyance system, $250 million to support restoration projects on the Kalmath, San Joaquin, and Sacramento rivers, and the Salton Sea project, and $200 million for grants to California communities to help conserve water. Using existing resources, DWR will implement numerous actions, including screening Delta agriculture intake pumps to protect smelt, restoring the North Delta's natural habitat, improving the Central Delta water flow patterns, and improving DWR's ability to respond to Delta emergencies, such as levee failures.

The Governor also has directed the Delta Vision Blue Ribbon Task Force to develop a delta management plan. The Task Force will present its findings and recommendations by January 1, 2008, and its strategic plan by October 31, 2008. The Bay-Delta Conservation Plan is also underway. The Plan is intended to ensure compliance with federal and state Endangered Species Act requirements in the Delta. The $1 billion proposed in the Governor's comprehensive plan will be used to fund recommendations from both the Delta Vision Task Force and the Conservation Plan.

Over the long-term, water supply availability and reliability will continue to be assessed by DWR (statewide) and CLWA (locally) in DWR's biennial SWP delivery reliability reports. These reports necessarily take into account a myriad of factors in evaluating long-term water supply availability and reliability. Those factors include multiple sources of water, a range of water demands, timing of water uses, hydrology, available facilities, regulatory restraints, including pumping constraints due to impacts on listed fish species, water conservation strategies, and future weather patterns. The *Watershed* and Wanger Decisions highlight the regulatory restraints applicable to SWP supplies, which have impacted DWR deliveries of SWP supplies in the past, and could curtail such deliveries in the future.

In the meantime, CLWA has advised the County that it intends to adopt interim policies governing the availability of imported SWP supplies to the Santa Clarita Valley; such policies are expected to be in effect until the new biological opinion is issued in the summer or fall of 2008.

While the *Watershed* and Wanger Decisions will have an impact on SWP supplies delivered to the Santa Clarita Valley, the Landmark Village project does not rely on SWP supplies; instead, the project will rely on the applicant's local Alluvial groundwater that is presently committed to agriculture uses to meet its

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19 For copies of the Governor's release issued July 17, 2007, please refer to http://gov.ca.gov/index.php?/print-version/press-release/6972/, a copy of which is included in **Appendix B** of this Final EIR.

potable water demand. The project applicant's right to the beneficial use of its local agricultural water resources is well established. This agricultural water will be available for agricultural production until it is phased out over time by the build-out of the Newhall Ranch Specific Plan, including the Landmark Village project. This local agricultural water supply has a historical track record of availability and reliability; it is a local, established, and sustainable water supply. This supply will provide approximately 80 percent of Newhall Ranch's potable water needs. Also, due to project conditions, the amount of local groundwater that will be used to meet Newhall Ranch's potable demands cannot exceed the amount of water historically and presently used by Newhall for agricultural uses. Therefore, no net increase in groundwater use will occur with implementation of Newhall Ranch, including the Landmark Village project.

The applicant also plans to accommodate its non-potable, or irrigation, water demand through the use of recycled water from local water reclamation plants (either the existing Valencia WRP or the approved Newhall Ranch WRP). Because these two independent primary water sources meet the potable and non-potable water needs of the Landmark Village project, no additional or supplemental potable water would be needed from the Bay-Delta via the SWP through CLWA.

In addition, because the applicant does not rely on imported water originating from the Bay-Delta for the Landmark Village project, the development will not result in any environmental impacts to the Bay-Delta, or contribute to the issues currently facing the Bay-Delta region. Nonetheless, there are current and future challenges facing the Bay-Delta, and Governor Schwarzenegger's efforts to implement legislation and other actions to address these issues represent important steps in the overall process.

TOPICAL RESPONSE 6: GLOBAL CLIMATE CHANGE AND ITS EFFECTS ON CALIFORNIA WATER SUPPLIES

Comments refer to future global climatic conditions that may affect California's water supplies through potential, though uncertain, changes related to air temperatures and precipitation and their resulting effects on water temperatures, water project operations, reservoir operations, stream runoff, and rise in sea levels affecting Delta water quality. The comments state that global climate change, or global warming, should be accounted for when assessing water reliability in California. Some comments rely upon an article entitled, "Emissions Pathways, Climate Change, Impacts on California," by Katharine Hayhoe, et al., dated August 24, 2004 (Hayhoe 2004). Other comments point to other reports and studies, including the California Department of Water Resources' (DWR's) technical report entitled, "Progress on Incorporating Climate Change into Management of California's Water Resources," dated July 2006 (Progress Report).[1] Still, other comments are critical of DWR's Progress Report (2006) and the preliminary modeling scenarios conducted to assess potential impacts of global climate change on the State Water Project (SWP).

The purpose of this topical response is to respond to comments related to global climate change and its effects on California's water supplies. First, however, it is important to emphasize that the water sources expected to serve the Landmark Village project are the applicant's agricultural water from the local Alluvial groundwater basin, which will be treated and used to meet the project's potable demand, and recycled water from local water reclamation plants, which will be used to meet the project's non-potable demand. The Landmark Village project does not rely on imported SWP supplies. Nonetheless, for other portions of the Santa Clarita Valley that rely, in part, on SWP supplies, the reliability of SWP water supplies can vary significantly and be reduced in dry years depending upon several factors. As stated in the Landmark Village Draft EIR, such factors include the "growing concern for water planners and managers [over] global warming and the potential impacts it could have on California's future water supplies." (Draft EIR, p. 4.10-46.) Because of the importance of SWP supplies as a supplemental water supply source to the Santa Clarita Valley as a whole, the Landmark Village Draft EIR provided extensive information regarding SWP supplies imported by CLWA to the Valley. (Draft EIR, pp. 4.10-44–4.10-57.) In addition, the Draft EIR addressed uncertainties associated with SWP supplies, including global warming and litigation challenges. (Id.)

Second, the response relies primarily upon information provided by DWR. The focus is on DWR's assessment of such global climate change issues, because DWR operates the SWP water storage and conveyance system, one of two major water projects that convey potable water to California's population.

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1 Please refer to **Appendix B** of this Final EIR for a copy of DWR's Progress Report (2006).

The other water storage and conveyance project is the federal Central Valley Project (CVP), which is operated by the U.S. Bureau of Reclamation (Reclamation). These two water systems are operated by DWR and Reclamation for water supply, flood management, environmental protection, and recreation.

DWR and Reclamation have formed a work team to address water resources related to issues of global climate change. The mission of the work team is to coordinate with other state and federal agencies to incorporate climate change science into California's water resources planning and management. The team will provide and regularly update information for decision makers on potential impacts and risks of global climate change, flexibility of existing facilities to accommodate climate change, and available mitigation measures.

The first product of the work team's efforts is DWR's Progress Report (2006). The report responds to the Governor's Executive Order S-3-05 requiring biennial reports on climate change impacts to various areas, including water resources. It provides information on potential impacts of selected climate change scenarios to operations of the SWP and CVP, Delta water quality, flood management, and evapotranspiration. The technical chapters of the report underwent peer review.

DWR's reporting and assessment on global climate changes and its effects on California's water supplies are important, because California's water supplies depend heavily on the accumulation of winter mountain snow melting into spring and summer runoff. As stated by DWR, "[a] warming planet may reduce this natural water storage mechanism . . . [and] [p]rojected increases in air temperature may lead to changes in the timing, amount and form of precipitation -- rain or snow, changes in runoff timing and volume, sea level rise effects on [Sacramento-San Joaquin] Delta water quality, and changes in the amount of irrigation water needed due to modified evapotranspiration rates." (DWR 2006, p. 1-2.)

In summary, DWR's planning documents, discussed below, address the uncertainties surrounding global climate change and its effects on California's water supplies. DWR also has acknowledged reports and other literature addressing climate change effects on California's water resources. According to this information, DWR has reported that California's future hydrologic conditions will likely be different from patterns observed over the past century -- although the precise causes, extent, and timing of the changes remain uncertain. DWR has further acknowledged that, as more sophisticated tools are developed and additional studies are completed, better quantification will be possible of global climate change and its effect on future water supplies.

Based on the information presented herein, the County has made the factual determination that global climate changes and their effects on California's water supplies are too speculative at this time for any further evaluation. The County's current determination is considered consistent with DWR, which

characterized its Progress Report (2006) on the progress of incorporating climate change into the management of California's water resources as follows:

> "The purpose of this report is to demonstrate how various analysis tools currently used by DWR could be used to address issues related to climate change. The methods and results presented in this report could be used to guide future climate change analysis and to identify areas where more information is needed.
>
> All results presented in this report are preliminary, incorporate several assumptions, reflect a limited number of climate change scenarios, and do not address the likelihood of each scenario. Therefore, these results are not sufficient by themselves to make policy decisions." (DWR Progress Report, p. II.)

The following primarily summarizes DWR's plans and reports related to potential impacts of global climate change on California's future water supplies. The response also lists and describes other selected reports and studies concerning global climate change and its effects on water supplies. In addition, the response identifies the previously adopted mitigation measures relative to water supplies, which conserve water supplies and lessen greenhouse gas emissions that contribute to global climate change. For a more detailed discussion, please refer to **Appendix B** of this Final EIR, which contains DWR's Progress Report (2006).

DWR Plans and Reports

DWR's SWP Delivery Reliability Report (2005)

DWR's 2005 SWP Delivery Reliability Report, April 2006 (Reliability Report), presents information from computer simulation studies of the operation of the SWP.[2] Using the CalSim-II model, DWR has simulated SWP operations, using historical rainfall and runoff data, which is then adjusted for changes in water and land use that have occurred or may occur in the future. The computer simulations were conducted over a 73-year period (1922-1994) of the adjusted historical rainfall/runoff data. This modeling approach incorporates the assumption that the next 73 years will have the same or similar rainfall/snowmelt amount and pattern, both within-year and from year-to-year, as the historical 1922-1994 period.

Based on this modeling assumption, DWR has noted that, currently, the CalSim-II model does "not incorporate any modifications to account for changes related to climate change" that could disrupt SWP deliveries. (Reliability Report, Chap. 3, p. 7.) Earlier in the Reliability Report, DWR also has acknowledged that that CalSim modeling and study approach includes the assumption that past rainfall-

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2 DWR's 2005 SWP Delivery Reliability Report (April 2006) is found in Appendix 4.10 of the Landmark Village Draft EIR.

runoff patterns will be repeated in the future and that this assumption has an "inherent uncertainty, especially given the evolving information on the potential effects of global climate change." (Id. at p. 4.) Relying upon the 2005 update to the California Water Plan, DWR summarized the potential effects of global climate change on future water supplies, as follows:

> "California's water systems have been designed and operated based on data from a relatively short hydrologic record. Mounting scientific evidence suggests that forecasted climate changes could significantly change California's precipitation pattern and amount from that shown by the record. Less snowpack would mean less natural water storage. More variability in rainfall, wetter at times and drier at times, would place more stress on the reliability of existing flood management and water systems. California's high dependence on reservoir storage and snowpack for water supply and flood management makes us particularly vulnerable to these types of projected hydrologic changes." (*California Water Plan Update*, December 2005, Vol. 1, page 3-15.)"

DWR also stated in its Reliability Report that:

> "Potential changes in climate patterns are becoming better defined and attempts to quantify the resulting impacts to SWP water supply are underway. Broad brush estimates are being developed of the potential impact upon the SWP in 50 to 100 years if no additional conveyance facilities or upstream reservoirs are built. As this information becomes more refined, it will be helpful in guiding the development of statewide strategies for the future management and development of water resources facilities, including the SWP." (Reliability Report, Chap. 2, p. 4.)

In the meantime, however, DWR has confirmed that the results of CalSim-II model studies conducted for the Reliability Report "represent the best available assessment of the delivery capability of the SWP." (Reliability Report, Chap. 3, p. 7.)

In response to concerns about future climate conditions that may affect water supplies, DWR has stated that information pertinent to climate change and its effects on water supplies "is evolving rapidly, but has not reached a level at which it can be quantitatively incorporated into delivery projections of the SWP."[3] Nonetheless, DWR has acknowledged that the published literature and other information are "helpful in developing strategies for the future management and development of the State's water resources, including improvements to the SWP." (Id.)

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3 See, DWR letter to Mindy McIntyre, Water Program Manager, Planning and Conservation League, dated April 20, 2006 (DWR's April 20, 2006 letter), which is found in Appendix G to DWR's 2005 SWP Delivery Reliability Report (April 2006). (See Appendix 4.10 of the Landmark Village Draft EIR for DWR's 2005 SWP Delivery Reliability Report, April 2006.)

DWR's California Water Plan Update (2005)

DWR's California Water Plan Update of 2005 (2005 Water Plan) also addresses uncertainties associated with global climate change and its potential effect on water supplies.[4] In Chapter 4 of the 2005 Water Plan, DWR summarizes the "predictions" surrounding global climate change, and they "include increased temperatures, reductions to the Sierra snowpack, earlier snowmelt, and a rise in sea level, although the extent and timing of the changes remain uncertain." (Id. p. 32.) DWR further states that these predicted changes "could have major implications for water supply, flood management, and ecosystem health. The prospect of significant climate change warrants examination of how California's water infrastructure and natural systems can be managed to accommodate or adapt to these changes, and whether more needs to be done." (Id.) DWR also acknowledges that, for over the past ten years, "scientists have been publishing formal, peer-reviewed recommendations for integrating the results of climate change research into policy." (Id.)

For example, in conjunction with affected state agencies, the Public Interest Energy Research Program (PIER) administered by the California Energy Commission has developed and is implementing a climate change research plan for California. The PIER program established a regional climate change research center with the goals of: (1) improving the understanding of the possible physical and economic impacts of climate change; and (2) developing robust adaptation and mitigation strategies for California. (See, 2005 Water Plan, p. 32, Box 4-9, PIER Program and Climate Change Research.) In support of future updates of the 2005 Water Plan, the newly-created research center is funding: (1) development and maintenance of a comprehensive climatic database for California and the analysis of meteorological and hydrological trends; (2) monitoring of meteorological and hydrological parameters in some key remote locations using innovative remote sensing devices; (3) development of climate projections for the state using regional climate models at levels of resolution appropriate for water resources impact analyses; and (4) study of water resources impacts under different climatic projections. DWR is a key co-sponsor of these research activities, and DWR staff is participating in the modeling efforts. (Id.)

Climate Change Report

DWR's 2005 Water Plan also referenced the work performed by the Pacific Institute for Studies in Development, Environment and Security (Pacific Institute). The Pacific Institute, in a literature search report for DWR, summarized recommendations for coping with and adapting to climate change from key peer-reviewed publications. The Pacific Institute's report is entitled, "Climate Change and California Water Resources: A Survey and Summary of the Literature," by Michael Diparsky and Peter H. Gleick,

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4 Pertinent portions of DWR's 2005 California Water Plan are summarized above and incorporated by this reference. A complete copy of the 2005 Water Plan is available online for public review by accessing DWR's website (http://www.waterplan.water.ca.gov/cwpu2005/index.cfm).

Pacific Institute, July 2003 (Climate Change Report). This report is included in the Volume 4 Reference Guide to the 2005 Water Plan.[5]

In the Climate Change Report, the Pacific Institute surveyed existing literature on climate change and its impacts on water resources in California. This report reviewed projected effects of climate change on the state's water supply, delivery, and quality, and explored the economics involved in meeting the challenges that those effects could bring about. (Climate Change Report, p. vii.) In general, the report confirmed temperature increases and their effects include a snowpack higher in elevation, with either lower or higher precipitation depending upon the information source (Climate Change Report, pp. 6, 10); either greater or lesser amounts of runoff depending upon the information source (p. 14); a greater number of extreme flood and drought events (p. 13); and reductions or increases in projected water use by plants (p. 10), again, depending upon the information source. Thus, depending upon the information presented, California could have more water available due to increased humidity and rainfall, or less water available due to reductions in snowpack, greater evaporation, and no change or slightly less rainfall.

The Climate Change Report concluded that managing water resources to address climate changes could prove different than managing for historical climate variability because: (1) climate changes could produce hydrologic conditions and extremes of a different nature than current systems were designed to manage; (2) they may produce similar kinds of variability but outside of the range for which current infrastructure was designed; (3) traditional water resource management assumes that sufficient time and information will be available before the onset of large or irreversible climate impacts to permit managers to respond appropriately; and (4) traditional management assumes that no special efforts or plans are required to protect against such uncertainties.

The Climate Change Report's literature survey resulted in specific recommendations for the following areas:

- Water planning and management
- Sea level concerns
- Modifying operation of existing systems
- New supply options
- Demand management, conservation, and efficiency
- Economics, pricing, and markets
- State water law
- Hydrologic and environmental monitoring.

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5 See, footnote 4, above.

The Climate Change Report further recommended that a more comprehensive assessment of all of these areas, supported by multiple state agencies and including the participation of a wide range of stakeholders, would be a valuable tool for policymakers and planners, and it was urged that such an assessment to be undertaken in the near future. (Id.)

The subject of groundwater was also addressed in the Climate Change Report. The report concedes that the impacts of global climate change on groundwater basins, and groundwater recharge characteristics are largely unknown. For example, the report notes that changes in groundwater recharge will result from changes in effective rainfall as well as a change in the timing of the recharge season. (Climate Change Report, p. 20.) Increased winter rainfall may be expected in some regions, leading to increased groundwater recharge. Conversely, higher evaporation or shorter rainfall seasons in other regions could mean that soil deficits persist for longer periods of time, shortening recharge seasons, citing Leonard, *et al*., 1999. However, warmer, wetter winters would increase the amount of runoff available for groundwater recharge. This additional runoff in the winter would be occurring at a time when some basins are either being recharged at their maximum capacity or are already "full." (Id.) On the other hand, reductions in spring runoff and higher evapotranspiration because of higher temperatures, could reduce the amount of water available for recharge.

However, "[t]he extent to which climate will change and the impact of that change are both unknown." (Id.) Overall, the recommendation is that possible climate changes may require more sophisticated conjunctive management programs in which "the aquifers are more effectively used as storage facilities." (Id.)

Although the data is still developing, the Climate Change Report has confirmed that a consensus in the literature is emerging to suggest that temperatures globally are increasing. Given that climate change is a complex topic, and that the world's climate has changed in cycles for hundreds of thousands, if not yet millions, of years, according to DWR, the cause of these climate changes and their effects have not reached a level at which such information can be quantitatively incorporated into the delivery projections of the SWP.[6]

Accounting for Climate Change Report

In addition, a DWR report on climate change impacts and the recommendations for further research has been prepared and included in the Volume 4 Reference Guide to the 2005 Water Plan. The report is

6 DWR's April 20, 2006 letter, p. 2.

entitled, "Accounting for Climate Change," by Maurice Roos, Chief Hydrologist, DWR (Accounting Report).[7]

The Accounting Report noted that evidence of global climate changes continues to develop, and this developing information has suggested that global climate change can affect the amount, timing, and form of precipitation (whether rain or snow) that California receives, as well as the sea level of the Pacific Ocean. This report disclosed that changes in weather, especially temperature and atmospheric composition, can affect water use and consumption. (Accounting Report, p. 1.) In addition, the Accounting Report indicated that most scientists feel that changes during the last several decades are likely mostly due to human activities, but natural causes and variability cannot be ruled out as significant components. The Accounting Report also stated that projections of the amount of warming and other climate changes during the 21st century are wide-ranging, depending on assumptions and models. The findings summarized in the Accounting Report provide that:

> "Whatever the causes, the prospects of significant changes warrant examination of how the State's water infrastructure and natural systems can accommodate or adapt to climate changes and whether more needs to be done to detect, evaluate and respond to water resource system effects. Many uncertainties remain, primarily on the degree of change to be expected. Responsible planning requires that the California water planning community work with climate scientists and others to reduce these uncertainties and to begin to prepare for those impacts that are well understood, already appearing as trends, or likely to appear." (Accounting Report, p. 1.)

Modeling Efforts

DWR's 2005 Water Plan also has referenced modeling efforts undertaken by the University of California, Davis (with funding from the Resource Agency, CALFED, and the California Energy Commission). The University used the "CALVIN" model to evaluate how California's water system might adapt to long-term climate warming. This preliminary analytical tool was used to integrate "existing surface water, groundwater, and water demand data in an integrated economic-engineering framework for California's inter-tied water system (covering 92 percent of California's population and 88 percent of its irrigated area)." (2005 Water Plan, p. 33.) Although a useful analytical tool, DWR noted that:

> "In developing the computer model [CALVIN], significant weaknesses and gaps in water data were identified and documented. The model and its results have been peer reviewed and show preliminary insights into economically promising possibilities for California water management. More importantly, the tool demonstrated concepts in advanced data management, documentation, and analysis that may be useful for future statewide and regional water policy and planning analysis. The CALVIN model has been applied preliminarily to examine statewide potential for regional and statewide water

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7 See, footnote 4, above.

> markets and how California's water system might adapt to long-term climate warming (through the [PIER] Program)." (Id.)

In addition, DWR's 2005 Water Plan has referenced computer modeling of global climate change scenarios, which predict significant future reductions in the Sierra snowpack.[8] (Id. pp. 33–34.) The model's simulation of potential changes in snowpack during the 21st century predicts a 52 percent reduction in the annual April through July runoff for a 2.1 degree C (3.8 F) of warming, which, according to DWR, is "well within the 1.4 to 5.8 degrees C (2.5 - 10.4 F) range predicted by global climate models for this century." (Id. p. 34.) According to DWR, "[c]hanges in the timing of snowfall and snowmelt, as a result of climate change, may make it more difficult to fill reservoir flood control space during late spring and early summer, potentially reducing the amount of surface water available during the dry season. . . . Reductions in snowpack may require changes in the operation of California's water systems and infrastructure, and increase the value of additional flood control space in reservoirs." (Id. p. 34.)

DWR's Progress Report (2006)

As stated above, in July 2006, DWR issued its report entitled, "Progress on Incorporating Climate Change into Management of California's Water Resources" (Progress Report). In this report, DWR describes progress made on incorporating climate change into existing water resources planning and management techniques and methodologies. The report was prepared in response to the Governor's Executive Order S-3-05, and as an opportunity to begin addressing limitations identified in DWR's 2005 Update to the California Water Plan.

Chapter 2 provides a statewide overview of California's water resources, and includes a summary of potential causes of global climate change with an emphasis on aspects of climate change that pose a potential threat to California's water supplies, including: (i) observed and projected changes in air temperature, precipitation and runoff, and sea level rise, including potential effects on groundwater and Delta water quality; (ii) potential effects of climate change on future water demands, Colorado River basin, and sensitive fish species; (iii) sudden climate change; and (iv) climate change and water supply planning challenges. Chapter 3 provides an overview of global climate change studies being conducted by DWR. DWR's study efforts, whenever appropriate, focused on the four climate change scenarios selected by the "Climate Action Team" (CAT), which was formed in response to Executive Order S-3-05. Specifically, DWR's initial studies focused on the potential effects of climate change to four main California water resources areas: (i) SWP and CVP operations; (ii) Delta water quality, including possible

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8 The source of this modeling is cited in the 2005 Water Plan References as: Knowles Noah, and Cayan D. 2002. Global Climate Change: Potential Effects on the Sacramento/San Joaquin Watershed and the San Francisco Estuary. Geophysical Research Letters 29. See footnote 4, above.

increases in sea level; (iii) flood management and water supply forecasting; and (iv) changes in evapotranspiration rates and the consumptive use of irrigation water.

Chapters 4 and 5 are of particular importance because they focus on climate change impacts on SWP and CVP operations and on the Delta. The results of the analysis undertaken in Chapter 4 suggest several potential climate change impacts on overall SWP and CVP operations and deliveries. For example, in three of the four climate scenarios simulated, CVP north-of-Delta reservoirs experienced shortages during droughts. DWR recommends that future studies examine operational changes that could avoid these shortages. At present, DWR concludes it is not clear whether such operational changes "will be insignificant or substantial." (Progress Report, p. III.)

The report also found that changes in annual average SWP south-of-Delta Table A deliveries ranged from a slight increase of about 1% for a wetter scenario to about a 10% reduction for one of the drier climate change scenarios. In three drier climate change scenarios, increased winter runoff and lower Table A allocations resulted in somewhat higher annual average Article 21 deliveries (Article 21 of the SWP long-term water supply contracts permits delivery of water excess to the delivery of Table A water and some other water types to those SWP contractors requesting it). The increase in Article 21 deliveries did not fully offset losses to Table A. In contrast, the wetter scenario with higher Table A allocations results in fewer Article 21 delivery opportunities and decreased annual average Article 21 deliveries. Changes in annual average CVP south-of-Delta deliveries ranged from increases of about 2.5% for the wetter scenario and decreases of up to 10% for drier climate change scenarios. Future studies will have to address how north-of-Delta shortages could impact south-of-Delta CVP deliveries. For both the SWP and CVP, carryover storage (i.e., water stored from one year over the next) was negatively affected in the drier climate change scenarios and slightly increased in the wetter scenario.

DWR also pointed out that sea level rise effects on water project operations were not examined due to lack of existing tools for that type of analysis. DWR noted that future work in this area will include the development of the necessary tools to quantify the impacts of sea level rise on saltwater intrusion and the incremental water supply impacts to repulse greater saltwater intrusion forces into the Delta. Chapter 5 focuses on potential impacts of climate change on Delta water quality and water levels. DWR concluded that while tools are being developed to quantify the incremental impacts of sea level rise on water supplies to counteract increased saltwater intrusion, until such tools become available, DWR's preliminary analysis provided an indication of the water project operational challenges due to sea level rise.

DWR's Progress Report (2006) is not without its critics. For example, as noted in a comment letter, Arve R. Sjovold reviewed the Progress Report and concluded it was "seriously flawed." Mr. Sjovold

acknowledged that the Progress Report adequately reviewed the literature on climate change; however, he was critical of its quantitative analyses, including that DWR's quantitative studies did not go to the "heart of the climate change problem." (See letter from California Water Impact Network, dated February 11, 2007, p. 6.) Despite this criticism, the County has determined that DWR is making progress on incorporating global climate change issues into its management of California's water supplies and that DWR's efforts are responsive to the directives of both the Governor and the Legislature to make progress toward assessing the impacts to California on global warming, including impacts to water supplies.

In short, the literature cited by DWR, and the most recent report prepared by DWR, confirm that, over time, California water supply managers will need to modify the methods used to manage water supplies in order to build-in the flexibility needed to address a dynamic water supply environment. However, it appears that more information is needed in order to draw definitive conclusions regarding the implications of climate change on water supplies. DWR has also committed to continue to incorporate new information in successive updates to the California Water Plan. At the same time, though, DWR itself concedes that its latest reporting effort is preliminary, incorporates several assumptions, reflects a limited number of climate change scenarios, and does not address the likelihood of occurrence of each scenario. For those reasons, DWR has concluded that the literature and study results to date are not sufficient by themselves to make "policy decisions." (Progress Report, p. II.)

Other Selected Reports and Studies

Urban Water Management Plan (December 2005)

The 2005 Urban Water Management Plan (UWMP) for the CLWA service area addresses the potential effects of global warming on California's future water supplies. Relying upon DWR's California Water Plan Update (2005), the UWMP identifies some potential impacts of global warming, based on more than a decade of scientific studies on the subject. The potential impacts include the production of hydrologic conditions, variability, and extremes that are different than what current water systems are designed to manage. Other potential impacts consist of questions on how rapidly impacts may occur to water supplies, and whether water planners and managers can protect against sudden changes.

Like other water purveyors, CLWA is relying upon DWR's commitment to continue to update and refine modeling efforts based on on-going scientific data, and to incorporate that information into future plans, reports, and studies issued by DWR. In the interim, however, CLWA and the retail purveyors in the Santa Clarita Valley have thoroughly described the available water resources in the Valley, including available local groundwater supplies, for the 25-year period covered by the UWMP. By law, the UWMP must be updated every five years, with the next update to occur no later than December 2010. The update also may be amended at any time, based on the discretion of CLWA and the retail purveyors in

the Santa Clarita Valley. This five-year updating requirement ensures that global climate change and its effects on local and imported supplies will be taken into account and regularly reported.

As to local groundwater supplies, the UWMP summarizes well-established findings from recent studies and groundwater modeling, which confirm that the local groundwater basin (Alluvial aquifer and Saugus Formation) is operating within sustainable yields and, as such, the basin remains in good operating condition and can continue to support pumping in the operating ranges reflected in the 2005 UWMP, or slightly higher, without adverse results (e.g., long-term water level decline, "overdraft," or degradation of groundwater quality). The primary studies that support these findings are as follows:

(a) Richard C. Slade & Associates, LLC, "2001 Update Report, Hydrogeologic Conditions in the Alluvial and Saugus Formation Aquifer Systems," prepared for Santa Clarita Valley Water Purveyors (July 2002);

(b) CH2MHill "Regional Groundwater Flow Model for the Santa Clarita Valley, Model Development and Calibration" (April 2004);

(c) CH2MHill, Technical Memorandum "Calibration Update of the Regional Groundwater Flow Model for the Santa Clarita Valley, Santa Clarita, California" (August 2005);

(d) CH2MHill and Luhdorff & Scalmanini, Consulting Engineers, "Analysis of Groundwater Basin Yield, Upper Santa Clara River Groundwater Basin, East Subbasin, Los Angeles County, California" (August 2005);

(e) UWMP, including Appendix C, "Groundwater Resources and Yield in the Santa Clarita Valley" (December 2005); and

(f) 2006 Santa Clarita Valley Water Report (May 2007).[9]

The August 2005 Basin Yield Report described and modeled the groundwater operating plan for the Valley. The model simulated a 78-year period of groundwater pumping, natural groundwater recharge (from rainfall and river storm flows), and natural groundwater flow and discharge that occurs in the basin. This 78-year rainfall record was derived from historical rainfall records dating back to the 1920s. Based on a review of those historical records, the simulated rainfall pattern was derived with two objectives in mind. First, the record was designed to capture historic cycles in rainfall, alternating periods of below-normal rainfall, then periods of above-normal rainfall, followed by periods of below-normal rainfall, etc. The 78-year rainfall record contained four periods of generally below-normal rainfall (ranging in length from seven to 15 years) and five periods of generally above-normal rainfall (ranging in length from six to eight years). Second, the record was designed to have a long-term volume of rainfall equal to the historic long-term average rainfall over the past several decades.

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9 All of these reports are available for public inspection and review at Impact Sciences, Inc., 803 Camarillo Springs Road, Suite A-1, Camarillo, California 93012, and are incorporated by this reference.

In summary, the rainfall pattern that was used in the modeling analysis was based on actual historic long-term rainfall and historic dry cycles and wet cycles. Thus, changes in climatic conditions over the past 78-year period were taken into account. If future climate change studies are published by DWR that predict changes in the strengths of future droughts and future wet periods, these effects could then be incorporated into the groundwater model to test the potential influence of climate change on the groundwater system; of course, any future studies that attempt to predict climate change effects on future local rainfall patterns are likely to have significant uncertainties. Nonetheless, when such studies are completed and available, CLWA and the local purveyors will consider them in local water planning efforts. Until then, however, CLWA and the local purveyors are relying upon the best available information presented in the reports and studies referenced above.

Emissions Pathway Report

The Emissions Pathway Report, cited in a comment letter, has discussed the magnitude of future climate changes based on climate projections from the modeling of greenhouse gas emissions scenarios out to the year 2100.[10] This report shows that, by the end of the century, due to increased temperatures, the Sierra snowpack could be reduced by 30-70 percent under one emissions scenario, and as high as 73-90 percent under another emissions scenario. The increased temperatures, along with impacts on runoff and stream flow, combined with modest declines in winter precipitation, could fundamentally disrupt California's water resources. (Emissions Pathway Report, p. 1.)

Pondering a Climate Conundrum

Other literature calls attention to the ongoing debate over global warming and its effects. For example, in an article presented in *Nature* (Online Version) entitled, "Pondering a Climate Conundrum in Antarctic," it has been suggested that there are cooling trends, not necessarily global warming. In that article, the authors noted a "[u]nique, distinct cooling trend discovered on the Earth's southernmost continent Antarctica overall has cooled measurably during the last 35 years - despite a global average increase in air temperature of 0.06 degrees Celsius during the 20th century - making it unique among the Earth's continental landmasses."[11]

Water Management Strategies

The Natural Resources Defense Council has prepared a report summarizing the "broad potential water management impacts of climate change, the many existing climate-related activities of water managers around the West, and a full range of recommendations for water managers and staff to consider as they

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10 See, Emissions Pathway Report, which is found in **Appendix B** of this Final EIR.

11 See, Pondering a Climate Conundrum in Antarctic, dated January 13, 2002, *Nature* (Online Version), which is found in **Appendix B** of this Final EIR.

incorporate global warming into the planning and management of their agencies."[12] After generally surveying the potential impacts of global climate change to water supply, flood management, water quality, aquatic ecosystems, and hydropower, and the effectiveness of presently utilized water management strategies to combat climate change impacts, the report proposes a four-part water management strategy for use by water managers that consists of: (i) evaluation of a water system's potential vulnerabilities at both a local and regional level; (ii) development of responsive strategies; (iii) commitment to global climate change prevention and the endorsement of GHG emissions reductions; and (iv) increased public outreach to improve awareness of global warming and climate change. As part of this strategy, and in order to better understand and prepare for the potential impacts to water resources as a result of global climate change, the report calls on various entities and individuals to provide additional funding for research.

Climate Warming and Water Management Adaptation for California

Tanaka et al. (2006) explore the ability of California's water supply system to adapt to long-term climatic and demographic changes using the California Value Integrated Network (CALVIN), a statewide economic-engineering optimization model of water supply management.[13] The results show agricultural water users in the Central Valley are the most sensitive to climate change, particularly under the driest and warmest scenario (i.e., PCM 2100), and predict a 37% reduction of Valley agricultural water deliveries and a rise in Valley water scarcity costs by $1.7 billion. Though the results of the study are only preliminary, they suggest that California's water supply system appears "physically capable of adapting to significant changes in climate and population, albeit at a significant cost." Such adaptation would entail changes in California's groundwater storage capacity, water transfers, and adoption of new technology.

Trends in Snowfall versus Rainfall in the Western United States

To better understand the nature of the observed changes in snowpack and streamflow timing in the west, Knowles et al. (2006) address historical changes in the relative contributions of rainfall and snowfall.[14] The study documents a regional trend toward smaller ratios of winter-total snowfall water to winter-total

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12 See, Nelson, Barry, et al., July 2007, "In Hot Water: Water Management Strategies to Weather the Effects of Global Warming." This report is found in **Appendix B** of this Final EIR.

13 See, Tanaka, S.K., et al., 2006. "Climate Warming and Water Management Adaptation for California. *Climatic Change*," Vol. 76, No. 3-4, June 10, 2006. This report is available for public inspection and review upon request at Impact Sciences, Inc., 803 Camarillo Springs Road, Suite A-1, Camarillo, California 93012, and is incorporated by this reference.

14 Knowles, N., and D. R. Cayan. 2002. "Potential Effects of Global Warming on the Sacramento/San Joaquin Watershed and the San Francisco Estuary." *Geophysical Research Letters* 29(18):1891, doi:10.1029/2001GL014339. This report is available for public inspection and review upon request at Impact Sciences, Inc., 803 Camarillo Springs Road, Suite A-1, Camarillo, California 93012, and is incorporated by this reference.

precipitation during the period of 1949-2004. The trends toward decreased winter-total snowfall are a response to warming across the region, with the most significant decreases occurring where winter wet-day minimum temperatures were on average warmer than -5° over the study period. The authors suggest that, if warming trends continue, the snowfall fraction of precipitation is likely to continue to decline, which combined with earlier melting of the remaining accumulations of snowpack, will diminish the West's natural freshwater storage capacity. This trend could, in turn, exacerbate tensions between flood control and storage priorities that many western reservoir managers face.

Climate Change Impacts on Water for Agriculture in California: A Case Study in the Sacramento Valley

Joyce et al. (2006) employ the Water Evaluation and Planning (WEAP) system, a hydrologic model that was developed for the Sacramento River Basin.[15] The study found that increasing temperatures could put a strain on the basin's water resources. Assuming an increasing urban demand for water, the effects of climate change could be mitigated if the agricultural sector adapts to the new environment. The authors considered the effect of increased irrigation efficiency and shifts in cropping and found that groundwater pumping between 2070 and 2100 was reduced when these practices were adopted.

Climate Scenarios for California

Cayan et al. (2006) consider two GHG emissions scenarios, a medium-high and a low.[16] The study found that California will experience a warming trend from 2000 to 2100, with temperatures rising between 1.7 and 5.8E C, depending on the model and the scenario chosen. This increase in temperature could potentially impact snowpack levels as the state experiences less snow and more rain. The results also indicate that snowpack in the Sierra Nevada could be reduced 32-79%, depending on the model and scenario chosen. The study does not consider the ability of California's water supply system to adapt to these potential changes.

County Determination

In summary, DWR has not yet fully incorporated parameters to account for climate change; however, as the literature and modeling tools continue to develop in order to assess such risks, DWR will incorporate such information into successive updates to the California Water Plan. In addition, DWR is committed to

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15 Joyce, B., et al. 2006. "Climate Change Impacts on Water for Agriculture in California: A Case Study in the Sacramento Valley." California Climate Change Center, State of California. White Paper, CEC-5500-2005-194-SF, March 2006. This report is available for public inspection and review upon request at Impact Sciences, Inc., 803 Camarillo Springs Road, Suite A-1, Camarillo, California 93012, and is incorporated by this reference.

16 Cayan, D., et al. 2006. "Climate Scenarios for California. California Climate Change Center, State of California. White Paper" CEC-500-2005-203-SF, March 2006. This report is available for public inspection and review upon request at Impact Sciences, Inc., 803 Camarillo Springs Road, Suite A-1, Camarillo, California 93012, and is incorporated by this reference.

the preparation of the biennial assessment reports of SWP delivery reliability. In the meantime, DWR reports that the results of its updated reports represent the best available information at this time.

Accordingly, based on the above data, the County agrees with DWR that it would be speculative at this time to quantify the effects of climate changes on the SWP system or the local groundwater basin. The County urges DWR to utilize on-going studies, as they become available, in developing strategies for the future management and development of California's water resources. At this time, the County believes it is appropriate to terminate any further analysis of potential future global climatic changes and their effects on California's water supplies, consistent with Section 15145 of the *CEQA Guidelines*.

Summary of Selected, Previously Adopted Mitigation Measures Relative to Water Supplies

Despite the present uncertainty regarding the quantification of future global climate changes and their effects on California's water supplies, the approved Newhall Ranch Specific Plan, which includes the Landmark Village project, already requires implementation of the following mitigation measures relative to water resources that would conserve water supplies and lessen greenhouse gas emissions within the Specific Plan area that contribute to global climate change:

Previously Adopted Mitigation Measures Relative to Water Supplies and Reductions in Greenhouse Gas Emissions

Water Service

SP 4.11-1 The proposed Specific Plan shall implement a water reclamation system in order to reduce the Specific Plan's demand for imported potable water. The Specific Plan shall install a distribution system to deliver non-potable reclaimed water to irrigate land uses suitable to accept reclaimed water, pursuant to Los Angeles County Department of Health Standards. (*Consistent with this measure, the Project Description section of this EIR discusses the fact that the Landmark Village project will install and implement a recycled water delivery system in order to reduce the project's demand for imported potable water. As required by this measure, recycled (reclaimed) water would be used to irrigate land uses suitable to accept recycled water, pursuant to Los Angeles County Department of Health Standards.*)

SP 4.11-2 Landscape concept plans shall include a palette rich in drought-tolerant and native plants. (Consistent with this measure, the Landmark Village project's landscape plans shall include a palette rich in drought-tolerant and native plants.)

SP 4.11-3 Major manufactured slopes shall be landscaped with materials that will eventually naturalize, requiring minimal irrigation. (Consistent with this measure, the Landmark Village project's grading/landscape plans shall include a note requiring landscaping with materials that will eventually naturalize, requiring minimal irrigation.)

SP 4.11-4 Water conservation measures as required by the State of California shall be incorporated into all irrigation systems. (Consistent with this measure, the Landmark Village project shall

incorporate into all of its irrigation systems water conservation measures required by the State of California.)

Wastewater Disposal

SP 4.12-1 The Specific Plan shall reserve a site of sufficient size to accommodate a water reclamation plant to serve the Newhall Ranch Specific Plan. (*This measure has been implemented by the Board of Supervisors' approval, in May 2003, of the Newhall Ranch WARP within the boundary of the Specific Plan.*)

TOPICAL RESPONSE 7: GLOBAL CLIMATE CHANGE AND ITS EFFECTS ON SENSITIVE BIOLOGICAL RESOURCES

Comments refer to global climate change and its potential effects on endangered, threatened, rare, and special-status species in California. Global climate change may affect such sensitive biological resources through potential, though uncertain, changes related to future air and water temperatures; such effects may impact the timing of seasons, affect a species' range, and a species' ability to adapt to changing temperatures. At the same time, the comments acknowledge that the ways in which global climate change may impact sensitive species and biological resources "are varied and sometimes complex." (See, Center for Biological Diversity letter, dated February 20, 2007, p. 15.)

The purpose of this topical response is to respond to comments related to global climate change and its effects on sensitive species and biological resources. The response is based on a literature review that was conducted to determine the current state of knowledge on global climate change and its effects on ecosystems. The response also includes the County's determination with respect to such issues.

1. Articles Addressing Global Climate Change and its Effects On Sensitive Biological Resources

(a) *Climate Change 2007: Climate Change Impacts, Adaptation, and Vulnerability* (April 6, 2007) – Working Group II Contribution to the Intergovernmental Panel on Climate Change, Fourth Assessment Report ("IPCC WGII 2007 Report")

This report addresses the "relationship between observed climate change and recent observed changes in the natural and human environment." (IPCC WGII 2007 Report, p. 2.) Based upon global assessment of data since 1970, the report concludes that "anthropogenic warming has had a discernable influence on many physical and biological systems." (Id., at p. 3.) The report notes that recent warming "strongly" affects terrestrial biological systems, such that there is an earlier timing of spring events, and poleward/upward shifts in the ranges in plant and animal species. (Id., at p. 3.) Similarly, with regard to marine and freshwater biological systems, there is evidence that impacts are occurring due to rising water temperatures, which impact ice cover, salinity, oxygen levels, and circulation. (Ibid.) The specific impacts to marine and freshwater biological systems include range shifts, the earlier migration of fish in rivers, and changing abundance levels of algal, plankton, and fish in high-latitude oceans and high-altitude lakes. (Ibid.) If temperature increases exceed 1.5-2.5°C, major changes are projected for ecosystem structure and function, species' ecological interactions, and species' geographic ranges - all resulting in predominantly negative consequences for biodiversity. (Id. at p. 8.)

The IPCC WGII 2007 Report also summarizes, however, the considerable scientific uncertainty associated with global climate change and its causes and effects on sensitive biological resources:

> "Limitations and gaps prevent more complete attribution of the causes of observed system responses to anthropogenic warming. First, the available analyses are limited in the number of systems and locations considered. Second, natural temperature variability is larger at the regional than the global scale, thus affecting identification of changes due to external forcing. Finally, at the regional scale other factors (such as land-use change, pollution, and invasive species) are influential." (Id., at p. 4.)

Similarly, the report notes that while climate change is beginning to have effects on many natural and human environments, "based on the published literature, the impacts have not yet become established trends." (Ibid.)

(b) *Observed Impacts of Global Climate Change in the U.S.* (November 2004), prepared for the PEW Center on Global Climate Change, Camille Parmesan, Hector Galbraith ("Parmesan and Galbraith 2004")[1]

Camille Parmesan and Hector Galbraith undertook a literature review to assess "the scientific evidence compiled to date on the observed ecological effects of climate change in the United States and their consequences" and the strength of that evidence. (Parmesan and Galbraith 2004 at p. iii.) The review included more than 40 studies showing a possible tie between global warming and ecological changes in the United States. In twenty of the studies, the authors found "strong evidence of a direct link" between climate change and observed ecological impacts in the United States. (Ibid.)

While the report identified general trends, such as shifts in the timing of ecological events and habitat ranges, it also noted that "many species and ecological systems of interest have yet to be studied (often due to inherent limitations of available data) and the attribution of ecological changes to a particular cause remains challenging." (Id., at pp. iii; see also p. 13 [there are "enormous difficulties biologists have encountered in tackling the question of climate change impacts"].) Further, "[m]any if not most of the ecosystems and organisms in the United States are already suffering from other anthropogenic stressors . . . [and] [a]s yet, scientists do not have a clear idea how climate change might affect this already fragile situation." (Id., at p. v.) Accordingly, the report recommends that scientists achieve a "better understanding of which systems or species are most or least susceptible to projected climate change" in order to better evaluate and mitigate potential impacts. (Id., at p. 41.)

In response to Parmesan and Galbraith 2004, other scientists have noted that plants and animals have adapted to climate change for millions of years and that it is not surprising to see plants and animals

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1 This report is available for public inspection and review at Impact Sciences, Inc., 803 Camarillo Springs Road, Suite A-1, Camarillo, California 93012, and is incorporated by this reference.

respond to present-day temperature changes.[2] Such responses to climate change do not necessarily show the changes are linked to fossil fuel emissions and human-caused climate change. (Ibid.)

As to Landmark Village, one comment letter cites Parmesan and Galbraith 2004 and impacts to the Edith's, Quino, Bay, and Taylor's checkerspot butterfly species. Relying upon Parmesan and Galbraith 2004, the comments state that the referenced butterflies are impacted by global warming. However, in a related context, USFWS has rejected similar claims that butterfly species may be endangered or threatened due to global climate change.[3] In the context of the Thorne's Hairstreak Butterfly, USFWS recognized recent evaluations by Parmesan and Galbraith 2004 that whole ecosystems are seemingly being shifted northward; however, USFWS found that the type, magnitude, or temporal effects of ecosystem changes that may be brought about by global climate change are speculative and stated it was not aware of any available documentation that directly links global warming as a threat to the butterfly. (Ibid.)

In addition, it should be noted that the butterfly species referenced in the comment are not present on the Landmark Village project site. (See, Draft EIR, Table 4.4-6, "Special Status Wildlife Species with Potential to Occur on Site," pp. 4.4-43 to 4.4-46 [not identifying any of the butterfly species as having the potential to exist on-site].) In fact, the Quino checkerspot butterfly is identified in Table 4.4-7 as a species that is *not* expected to be found on the project site, because its presence was last documented in Los Angeles County in 1954. (Draft EIR, pp. 4.4-47, 4.4-70.)

(c) *Status and Trends of the Nation's Biological Resources* (1998), U.S. Department of the Interior, U.S. Geological Survey, Biological Resources Division ("USGS 1998 Status/Trends Report")[4]

A chapter of this report addresses the impacts of climate change on the nation's biological resources. (USGS 1998 Status/Trends, at pp. 89–116.) The report closely considers impacts to avian species, and notes that "the ranges of most species moved north, up mountain slopes, or both." (Id., at p. 101.) Accordingly, such range shifts "could cause local extinctions in the more southern portions of the birds' ranges, and, if movement to the north is impossible, extinctions of entire species could occur." (Ibid.) The report also considers impacts to reptiles and amphibians, and notes that they are likely to be impacted because they are especially susceptible to extreme temperature, must remain close to water sources, and are not able to disperse at a rapid rate. (Ibid.) In addition, "[i]n general, animals most likely to be affected

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2 Tom Stohlgren, a U.S. Geological Survey ecologist, Fort Collins, Colorado.

3 See, USFWS 90-day finding on petition to list the Thorne's Hairstreak Butterfly as threatened or endangered (2006 Federal Register, 71 FR 44980-44988), which is available for public review and inspection by reference to the Federal Register online website, and is incorporated by this reference.

4 This report is available for public inspection and review at Impact Sciences, Inc., 803 Camarillo Springs Road, Suite A-1, Camarillo, California 93012, and are incorporated by this reference.

earliest by climatic change are those in which populations are fairly small and limited to isolated habitats." (Id., at p. 102.)

Significantly, this report notes that "[w]hat is most needed to evaluate potential biological effects of temperature change is a regional projection of climatic changes that can be applied to ecosystems at a regional or local scale" and "estimates of climatic variability during the transition to a new equilibrium, particularly at the regional scale." (Id., at pp. 94–95.) In addition, "[a] focus of climate research toward changing climatic variability [citations] might be more useful for ecological impact assessments than the current focus among climatic modelers on climatic means." (Id., at p. 112.) Finally, these projections, in order to be "more realistic and useful . . . [require a] multiscale, multispecies, multitaxa analysis driven by regionally specific, transient climatic change forecasts." (Ibid.)

The report also states that "at present [transient regional changes] are very difficult to predict credibly." (Id., at p. 95; see also p. 110 [As contrasted with regional assessments, "[t]he most reliable projects for climatic models are for global-scale temperature changes."].) This point is further underscored by the conclusion that climate forecast models are "fraught with uncertainties," leading to "the perplexing question" of "whether they can be trusted as a reliable basis for altering social policies, such as those governing CO_2 emissions or the shape and location of wildlife reserves." (Ibid.)

After disclosing the inadequacies of the projection models, this report assesses the policy implications:

> "Climatic change as now envisioned is not necessarily a threat to the well-being of all climate-sensitive species. However, the transient nature of most projected human-induced climatic change scenarios suggests that significant alterations are likely on a scale of decades, whereas the adaptability of many species - especially those upon which faster responding species depend - is on a scale of centuries. . . . The only forecast that seems unassailable is that the more rapidly the climate changes and the more extensively other human disturbances are forced on nature, the higher the probability of substantial disruption and surprise within natural systems.
>
> To forecast possible consequences of the projected climate changes, single-species studies should be guided by the overall effects that climate may have at the large scale or on range limits and abundance patterns, and on the interactions among species. Coupling such results with information from climatologists, geologists, and others will allow interdisciplinary teams to more reliably forecast the possible biological consequences of scenarios of global warming and other global changes. These forecasts can then be used by policy makers and the general public to determine what types of actions might be effective to mitigate potential impacts of forecasted climate changes. Research can help put such policy making of a firmer factual basis, but any plausible level of effort is not likely to reduce all important uncertainties before the global change experiment now under way on Earth is played out [citation]." (Id., at p. 113.)

(d) ***The Regional Impacts of Climate Change: An Assessment of Vulnerability* (1997), Intergovernmental Panel on Climate Change, Special Report ("IPCC 1997 Report")**[5]

This report evaluates the regional impacts of climate change across the globe. With regard to impacts to North America, this report concludes that the "characteristics of the subregions and sectors . . . suggest that neither the impacts of climate change nor the response options will be uniform." (IPCC 1997 Report, Chapter 8 Executive Summary.) Nonetheless, the report concludes that reductions in terrestrial biological diversity are likely due to loss of habitat. (Ibid.) The same conclusion is reached as to fisheries and aquatic systems because of expected increases to water temperature, changes in freshwater flows and mixing regimes, and alterations to water quality. (Ibid.) In spite of the anticipated impacts, the report discloses significant scientific uncertainties:

> "Our current understanding of the potential impacts of climate change is limited by critical uncertainties. One important uncertainty relates to the inadequacy of regional-scale climate projections relative to the spatial scales of variability in North American natural and human systems. This uncertainty is compounded further by the uncertainties inherent in ecological, economic, and social models - which thereby further limit our ability to identify the full extent of impacts or prescriptive adaptation measures. *Given these uncertainties, particularly the inability to forecast futures, conclusions about regional impacts are not yet reliable* and are limited to the sensitivity and vulnerability of physical, biological, and socioeconomic systems to climate change and climate variability." (Ibid., italics added.)

More simply, the report concludes "[u]ncertainty exists in our ability to predict ecosystem or individual species responses to elevated CO_2 and global warming at either the regional or global scale." (Ibid.)

2. County Determination

The County has considered the above comments and the literature review conducted. On the basis of that information, the County has made the factual determination that evidence exists linking global climate change to ecological effects; however, the precise causes, extent, magnitude, and timing of such effects remain uncertain and preclude reliable forecasts of possible ecological effects resulting from global climate change. Based on the information presented herein, the County has made the further factual determination that global climate change and its effect on sensitive species and other biological resources are too speculative at this time for any further evaluation. Accordingly, the County believes it is appropriate to terminate any further analysis of such effects, consistent with Section 15145 of the *CEQA Guidelines*.

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5 This report is available for public inspection and review at Impact Sciences, Inc., 803 Camarillo Springs Road, Suite A-1, Camarillo, California 93012, and are incorporated by this reference.

TOPICAL RESPONSE 8: GREENHOUSE GAS EMISSIONS AND GLOBAL CLIMATE CHANGE

Comments state that the Landmark Village Draft EIR did not analyze and mitigate the project's greenhouse gas (GHG) emissions. Other comments claim that California law requires the analysis and reduction of greenhouse gases. Comments also claim that global warming will adversely impact water supplies and their reliability, and sensitive biological resources. Still other comments claim that the proposed project should take into account the new California law (AB 32) and its 2020 GHG emissions target. In addition, comments refer to recent U.S. Supreme Court litigation (*e.g.*, *Massachusetts v. EPA, et al.*) and other cases addressing global climate change and its regulation.

Other comments claim that global warming is responsible for numerous impacts, including: (a) reductions in snowpack during the next 100 years, which threaten California's water supply; (b) health impacts due to increases in the frequency, duration, and intensity of conditions conducive to air pollution formation and heat; (c) potential impacts to agricultural resources; (d) potential impacts to California's economy; (e) sea-level rise, coastline erosion, and saltwater intrusion; and (f) increased pest infestations and wildfire vulnerability due to increases in air temperatures.

The newly enacted California Global Warming Solutions Act of 2006 (AB 32) acknowledges that global warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California (Health & Safety Code §38501(a)). This law also acknowledges that the "potential adverse impacts of global warming include the exacerbation of air quality problems, the reduction in quality and supply of water to the state from the Sierra snowpack, a rise in sea levels resulting in the displacement of thousands of coastal businesses and residences, damage to marine ecosystems and the natural environment, and an increase in the incidences of infectious diseases, asthma, and other human-health related problems." (*Ibid.*)

The main sources of greenhouse gases have been documented. As of 2002, fossil fuel consumption in the transportation sector was the single largest source of California's greenhouse gas emissions (41.2%), with the industrial sector as the second-largest source (22.8%), followed by electrical production from both in-state and out-of-state sources (19.6%), agricultural and forestry (8.0%), and other activities (8.4%).[1] Thus, for example, in terms of a land use development project, the most significant sources of greenhouse gases would be vehicle emissions during both the construction and operational phases of the project, and fossil

[1] See, *Climate Action Team Report to Governor Schwarzenegger and the Legislature*, California Environmental Protection Agency, March 2006, pp. 9–10. This report is available for public inspection and review at Impact Sciences, Inc., 803 Camarillo Springs Road, Suite A-1, Camarillo, California 93012, and is incorporated by reference.

fuel consumption for the generation of electricity to supply the residential, commercial, mixed-use, and other uses.

This response acknowledges the scientific consensus that global climate change will increase the frequency of heat extremes, heat waves, and heavy precipitation events. Currently accepted models predict that continued GHG emissions at or above current rates will produce more extreme global climate changes during the 21st century than were observed during the 20th century. There also is no scientific uncertainty about the fact that human activities have increased the atmospheric abundance of greenhouse gases. Nonetheless, there are uncertainties. The uncertainties center on predicting what the climate changes will be in various areas on Earth, determining the rate at which air and water temperatures will rise, whether the consequences of global climate change will be sudden or gradual, whether the consequences will be catastrophic or manageable, and the efficacy of international, national, state, and local measures to reduce GHG emissions. There are also uncertainties associated with characterizing the timing and magnitude of global climate changes, including sea level rise, spread of certain diseases from their usual geographic range, the effect on agricultural production, water supply, sustainability of ecosystems, increased strength and frequency of storms, heat events, air pollution episodes, and the impact of these effects on human health and the economy.[2]

Despite these uncertainties, this response addresses the subject of global warming/global climate change, summarizes the state of the science, describes the current regulatory setting, and focuses on project design features to reduce GHG emissions. This response also should be read in conjunction with two other responses addressing global climate changes and its effects: **Topical Response 6**: Global Climate Change And Its Effects On California Water Supplies, and **Topical Response 7**: Global Climate Change And Its Effects On Sensitive Biological Resources.

1. Introduction

Landmark Village is a mixed-use community that is a part of the larger approved Newhall Ranch Specific Plan to be built in the northern, unincorporated area of Los Angeles County within the Santa Clarita Valley Planning Area. The development site is located within the jurisdiction of the South Coast Air Quality Management District (SCAQMD). Once completed, the Landmark Village community will contain 1,444 residences, including 308 single-family homes and 1,136 multi-family units, as well as an elementary school, community park, 1,033,000 square feet of commercial and mixed-use floor area, fire station, extensive trail system, transit improvements (including a park and ride/future transit station lot),

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2 See, *Climate Action Team Report to Governor Schwarzenegger and the Legislature*, California Environmental Protection Agency, March 2006, pp. 15–16 (incorporated by reference, above).

additional private recreation and open space areas. Landmark Village is located directly adjacent to the Valencia Commerce Center one of the largest employment centers in the Santa Clarita Valley.

Residents of residential developments that also contain some commercial and municipal uses engage in activities such as electricity use, water use, natural gas combustion for heating, drying and cooking, and motor vehicle transportation that directly or indirectly emit GHG emissions. The most significant GHG emissions resulting from such residential developments are emissions of carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O). CO_2 is considered the most important GHG, due primarily to the large emissions produced by fossil fuel combustion, especially for the generation of electricity and powering of motor vehicles. CH_4 and N_2O are also emitted, though their emissions are much less significant when compared to CO_2. CH_4 is also emitted from the transmission, storage, and incomplete combustion of natural gas. GHG emissions from water supply and sewage treatment are primarily due to the energy required to convey, treat, and distribute water. Additional emissions from wastewater treatment include methane (CH_4) and nitrous oxide (N_2O), emitted directly from the wastewater.

Although both the World Resources Institute (WRI) and the California Climate Action Registry have published protocols for estimating GHG emissions from particular processes, neither SCAQMD nor the California Air Resources Board (ARB) has developed guidelines for the preparation of GHG inventories for CEQA purposes. As questions such as, which emissions to consider as "new" are critical to the preparation of an inventory, absent such guidance, this response does not quantify GHGs from the proposed Landmark Village project. Instead, the report focuses on three major sections: (1) a summary of the state of global climate change science, based primarily on the findings of the IPCC; (2) a summary of domestic and state regulatory efforts to limit and reduce greenhouse gas emissions; and (3) a discussion of potential project design features to reduce GHG emissions.

Following this introduction, Sections 2 and 3 detail the state of climate change science and the regulatory setting. Section 4 contains a description of potential project design features that can be used to reduce GHG emissions associated with the Landmark Village development.

2. State of the Science

This section summarizes the scientific issues surrounding climate change and global warming. It also provides a discussion of what types of things contribute to climate change and puts into context global, national, and state emissions of greenhouse gases.

Global Climate Change

Global warming and *global climate change* are both terms that describe changes in the earth's climate. *Global climate change* is a broader term used to describe any worldwide, long-term change in the earth's climate.

This change could be, for example, an increase or decrease in temperatures, the start or end of an ice age, or a shift in precipitation patterns. The term *global warming* is more specific than global climate change and refers to a general increase in temperatures across the earth. Though global warming is characterized by rising temperatures, it can cause other climatic changes, such as a shift in the frequency and intensity of rainfall or hurricanes. Global warming does not necessarily imply that all locations will be warmer. Some specific, unique locations may be cooler even though the world, on average, is warmer. All of these changes fit under the umbrella of global climate change.

While global warming can be caused by natural processes, there is a general scientific consensus that most current global warming is the result of human activity on the planet.[3] This man-made, or anthropogenic, warming is primarily caused by increased emissions of "greenhouse gases" that keep the earth's surface warm. This is called "the greenhouse effect." The greenhouse effect and the role greenhouse gases play in it are described below.

The Greenhouse Effect

Greenhouses allow sunlight to enter in and then capture some of the heat generated by the sunlight's impact on the earth's surface. The earth's atmosphere acts like a greenhouse by allowing sunlight in, but trapping some of the heat that reaches the earth's surface. When solar radiation from the sun reaches the earth, much of it penetrates the atmosphere to ultimately reach the earth's surface; this solar radiation is absorbed by the earth's surface and then re-emitted as heat in the form of infrared radiation.[4] Whereas the greenhouse gases in the atmosphere let solar radiation through, the infrared radiation is trapped by greenhouses gases, resulting in the warming of the earth's surface.[5]

The earth's greenhouse effect has played a key role in the development of life. Concentrations of major greenhouse gases, such as CO_2, CH_4, N_2O, and water vapor (H_2O) have been naturally present for millennia at relatively stable levels in the atmosphere, adequate to keep temperatures on Earth hospitable. Without these greenhouse gases, the earth's temperature would be too cold for life to exist.

As human industrial activity has increased, atmospheric concentrations of certain greenhouse gases have increased dramatically. In the absence of major industrial human activity, natural processes have maintained atmospheric concentrations of greenhouse gases, and, therefore, global temperatures at

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3 From the IPCC "Climate Change 2007: The Physical Science Basis, Summary for Policymakers." Available online at: http://www.ipcc.ch/SPM2feb07.pdf, and incorporated by this reference.

4 All light, be it visible, ultraviolet, or infrared, carries energy.

5 Infrared radiation is characterized by longer wavelengths than solar radiation. Greenhouse gases reflect radiation with longer wavelengths. As a result, instead of escaping back into space, greenhouse gases reflect much infrared radiation (i.e., heat) back to Earth.

constant levels over the last several centuries.[6] As the concentrations of greenhouse gases increase, more infrared radiation is trapped, and the earth is heated to higher temperatures. This is the process that is described as human-induced global warming.

In February 2007, the IPCC[7] provided a comprehensive assessment of climate change science.[8] It stated that there is a scientific consensus that the global increases in greenhouse gases since 1750 are mainly due to human activities such as fossil fuel use, land use change (e.g., deforestation), and agriculture. In addition, the report stated it is likely that these changes in greenhouse gas concentrations have contributed to global warming. Confidence levels used in this report have increased since 2001 due to the large number of simulations run and the broad range of available climate models.

In April 2007, the IPCC provided an assessment of the "current scientific understanding of impacts of climate change on natural, managed, and human systems, the capacity of these systems to adapt and their vulnerability."[9] Here, the IPCC stated that although some people will gain and some will lose because of global climate change, the overall change will be of social and economic losses. These negative effects will likely be disproportionately shouldered by the poor who do not have the resources to adapt to a change in climate. Some of the main ecosystem changes anticipated are that biodiversity of terrestrial and freshwater ecosystems will be compromised and that the ranges of infectious diseases will likely increase.

Greenhouse Gases and Their Emissions

The term "greenhouse gases" includes gases that contribute to the natural greenhouse effect, such as CO_2, CH_4 and N_2O, and H_2O, as well as gases that are only man-made and that are emitted through the use of modern industrial products, such as HFCs and PFCs. These last two families of gases, while not naturally present, have properties that also cause them to trap infrared radiation when they are present in the atmosphere, thus making them greenhouse gases. These six gases comprise the major GHGs that are

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6 Examples of natural processes include the addition of GHGs to the atmosphere from respiration, fires, and decomposition of organic matter. The removal of greenhouse gases is mainly from plant and algae growth and absorption by the ocean.

7 The World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP) established the Intergovernmental Panel on Climate Change (IPCC) in 1988; it is open to all members of the United Nations (UN) and WMO.

8 Available online at: http://www.ipcc.ch/SPM2feb07.pdf, and incorporated by reference.

9 Available online at: http://www.ipcc-wg2.org/index.html, and incorporated by reference.

recognized by the Kyoto Protocol.[10] There are other GHGs that are not recognized by the Kyoto Protocol, due, chiefly to the smaller role that they play in climate change. One GHG not recognized by the Kyoto Protocol is atmospheric water vapor, because water vapor concentrations do not show obvious correlations with specific human activities. Water vapor appears to act in a feedback manner; higher temperatures lead to higher water vapor concentrations, which in turn cause more global warming.[11]

The effect each of these gases on global warming is a combination of the volume of their emissions and their global warming potential (GWP). GWP indicates, on a pound for pound basis, how much a gas will contribute to global warming relative to how much warming would be caused by the same mass of carbon dioxide. Methane and nitrous oxide are substantially more potent than carbon dioxide, with GWPs of 21 and 310, respectively.[12] However, these natural greenhouse gases are nowhere near as potent as sulfur hexafluoride and fluoromethane, which have GWPs of up to 23,900 and 6,500, respectively.[13] GHG emissions are typically measured in terms of mass of carbon dioxide equivalents (CO_2e). CO_2e are calculated as the product of the mass of a given GHG and its specific GWP.

The most important greenhouse gas in human-induced global warming is carbon dioxide. While many gases have much higher GWPs than the naturally occurring greenhouse gases, carbon dioxide is emitted in such vastly higher quantities that it accounts for 85 percent of the GWP of all GHGs emitted by the United States.[14] Fossil fuel combustion, especially for the generation of electricity and powering of motor vehicles, has led to substantial increases in carbon dioxide emissions and thus substantial increases in atmospheric carbon dioxide concentrations. In 2005, atmospheric carbon dioxide concentrations were about 379 parts per million (ppm), over 35 percent higher than the pre-industrial concentrations of about

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10 The Kyoto Protocol to the United Nations Framework Convention on Climate Change requires parties to proceed "with a view to reducing their overall emissions of such [greenhouse] gases by at least 5 per cent below 1990 levels in the commitment period 2008 to 2012." (Kyoto Protocol, Article 3, ¶1.) The treaty was negotiated in Kyoto, Japan in December 1997, opened for signature on March 16, 1998, closed for signature on March 15, 1999, and came into force on February 16, 2005. The United States is a signatory to the Kyoto Protocol, but neither President Clinton nor President Bush submitted the treaty to Congress for approval. Therefore, because the treaty has not been ratified, the terms of the treaty are not binding on the United States.

11 From the IPCC Third Assessment Report: http://www.grida.no/climate/ipcc_tar/wg1/143.htm and http://www.grida.no/climate/ipcc_tar/wg1/268.htm, which is incorporated by reference.

12 GWPs were developed by the Intergovernmental Panel on Climate Change (IPCC). The most recent GWP values are from IPCC's Third Assessment Report (TAR, 2001) and are slightly different from those presented here. However, GWP values from the Second Assessment Report (SAR, 1996) are still used by international convention and are presented in this response where relevant.

13 California Climate Action Registry General Reporting Protocol - Reporting Entity-Wide Greenhouse Gas Emissions. SAR values, Appendix C. http://www.climateregistry.org/docs/PROTOCOLS/GRP%20V2-March2007.pdf, which is incorporated by reference.

14 Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2004, U.S. Environmental Protection Agency. Available online at: http://yosemite.epa.gov/oar/globalwarming.nsf/UniqueKeyLookup/RAMR6MBSC3/$File/06_ Complete_Report.pdf, and incorporated by reference.

280 ppm.[15] In addition to the sheer increase in the volume of its emissions, carbon dioxide is a major factor in human-induced global warming because of its lifetime in the atmosphere of 50 to 200 years.

The second most prominent GHG, methane, also has increased due to human activities such as rice production, degradation of waste in landfills, cattle farming and natural gas mining. In 2005, atmospheric levels of methane were more than double pre-industrial levels, up to 1774 parts per billion (ppb) as compared to 715 ppb.[16] Methane has a relatively short atmospheric lifespan of only 12 years, but has a higher GWP than carbon dioxide.

Nitrous oxide concentrations have increased from about 270 ppb in pre-industrial times to about 319 ppb by 2005.[17] Most of this increase can be attributed to agricultural practices (such as soil and manure management), as well as fossil-fuel combustion and the production of some acids. Nitrous oxide's 120-year atmospheric lifespan increases its role in global warming.

Besides carbon dioxide, methane and nitrous oxide, there are several gases and categories of gases that were not present in the atmosphere in pre-industrial times but now exist and contribute to warming. These include CFCs, used often as refrigerants, and their more stratospheric-ozone-friendly replacements, HFCs. Fully fluorinated species, such as SF_6 and CF_4, are present in the atmosphere in relatively small concentrations, but have extremely long life spans of 50,000 and 3,200 years each, making them potent greenhouse gases.

The Effects of Global Warming

There is a scientific consensus that global climate change will increase the frequency of heat extremes, heat waves, and heavy precipitation events. Currently accepted models predict that continued greenhouse gas emissions at or above current rates will induce more extreme climate changes during the 21st century than were observed during the 20th century. A warming of about 0.2°C per decade is projected. Even if the concentrations of all greenhouse gases and aerosols are kept constant at year 2000 levels, a further warming of about 0.1°C per decade would be expected. A faster temperature increase will lead to more dramatic, and more unpredictable, localized climate extremes. Other likely direct effects of global warming include an increase in the areas affected by drought, an increase in tropical cyclone activity and higher sea level, as well as the continued recession of polar ice caps. Examples of the indirect results that may be caused by some of these climatic changes include decreases in biodiversity and expanded ranges for infectious diseases like malaria. There are already some identifiable signs that

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15 Page 2 of the IPCC "Climate Change 2007: The Physical Science Basis, Summary for Policymakers."

16 Page 4 of the IPCC "Climate Change 2007: The Physical Science Basis, Summary for Policymakers."

17 *Ibid*.

global warming is taking place. In addition to substantial ice loss in the Arctic, the top seven warmest years since the 1890s have been after 1997.[18]

California Climate Impacts

Global temperature increases may have a series of significant negative impacts on the health of California residents and the California economy. One result of the higher temperatures caused by global warming may be compromised air quality. Warmer temperatures can cause more ground-level ozone, a pollutant that causes eye irritation and respiratory problems. California relies primarily on snowmelt for its drinking water and much of the water used in irrigation during the summer. Global warming could alter the seasonal pattern of snow accumulation and snowmelt and threaten the availability of water. Climatic changes would also affect agriculture, a major California industry, which could result in economic losses. For example, the heat wave in July 2006 is estimated to have cost the California dairy industry in excess of one billion dollars.[19]

Global, National, and California-wide GHG Emissions Inventories

Worldwide emissions of GHGs in 2004 were 30 billion tons of CO_2e per year.[20] In 2004, the US emitted about 8 billion tons of CO_2e or about 25 tons/year/person.[21] Over 80 percent of the GHG emissions in the United States are comprised of CO_2 emissions from energy related fossil fuel combustion. In 2004, California emitted 0.49 billion tons of CO_2e, or about 5 percent of the US emissions. If California were a country, it would be the 16th largest emitter of greenhouse gases in the world.[22] This large number is due primarily to the sheer size of California. Compared to other states, California has one of the lowest per capita GHG emission rates in the country. This is due to California's higher energy efficiency standards, its temperate climate, and the fact that it relies on substantial out-of-state energy generation.

In 2004, 81 percent of greenhouse gas emissions (in CO_2e) from California were comprised of carbon dioxide emissions from fossil fuel combustion. Methane and nitrous oxide accounted for 5.6 percent and 6.8 percent of total CO_2e respectively, and high GWP gases[23] accounted for 2.9 percent of the CO_2e

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18 Statistics from IPCC working group I and II.

19 Office of the Governor.

20 Sum of Annex I and Annex II countries without counting Land-Use, Land-Use Change and Forestry (LULUCF) http://unfccc.int/ghg_emissions_data/predefined_queries/items/3814.php (incorporated by reference). For countries that 2004 data was unavailable, the most recent year was used.

21 2006 Inventory of U.S. Greenhouse Gas Emissions and Sinks. Available online at: http://yosemite.epa.gov/oar/globalwarming.nsf/UniqueKeyLookup/RAMR6MBLP4/$File/06ES.pdf, and incorporated by reference.

22 Anywhere between the 12th and 16th depending upon methodology. Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2004. California Energy Commission (incorporated by reference).

23 Such as HFCs and PFCs.

emissions. Transportation is by far the largest end-use category of GHGs. Transportation includes that used for industry as well as residential use.

3. Regulatory Setting

As consensus over human-induced global climate change has grown, lawmakers at the national, state, and local levels have introduced legislation and regulations aimed at better tracking and controlling GHGs. On the national level, some incentives for businesses and individuals to take voluntary steps to limit GHG emissions have been established. No federal legislation capping GHG emissions or requiring reporting has been passed. The recent U.S. Supreme Court decision in *Massachusetts et al. v. EPA, et al.*, may result in action towards federal regulation to limit automotive GHG emissions beyond reductions required under current Corporate Average Fuel Economy regulations. In the absence of federal action, many regions, states, and municipalities have taken independent action. For example, California recently passed the California Global Warming Solutions Act of 2006 (Assembly Bill 32 or AB 32), which established mandatory reductions in statewide GHG emissions by 2020. The following is a summary of relevant national and state GHG legislation and legislative proposals.

Federal Action on Greenhouse Gas Emissions

On the national level, efforts to reduce GHG emissions have been taking place in the executive and legislative branches. In 2002, President George W. Bush set a national policy goal of reducing the GHG emission intensity (tons of GHG emissions per million dollars of gross domestic product) of the U.S. economy by 18 percent by 2012. However, binding caps and/or reductions did not accompany this goal; rather, the U.S. Environmental Protection Agency (USEPA) administers a variety of voluntary programs and partnerships with GHG emitters. Such programs include the "Climate Leaders" program, in which companies create long-term GHG emission record-keeping and reduction strategies, and the high GWP gas voluntary programs, in which the USEPA partners with industries producing and utilizing synthetic gases to reduce emissions of these particularly potent GHGs.[24]

A recent development that may affect federal action on climate change is the April 2, 2007 U.S. Supreme Court decision ruling in favor of petitioners in *Massachusetts et al. v. EPA, et al.*[25] In that case, the Supreme Court ruled that the USEPA was authorized by the Clean Air Act to regulate CO_2 emissions from new motor vehicles. While the Court did not mandate that the USEPA enact regulations to reduce GHG emissions, it found that the only cases in which the USEPA could avoid taking action were if it found that GHGs do not contribute to climate change or if it offered a "reasonable explanation" for not determining

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24 http://www.epa.gov/climatechange/policy/index.html (incorporated by reference).

25 http://www.supremecourtus.gov/opinions/06pdf/05-1120.pdf (incorporated by reference).

that GHGs contribute to climate change. The Supreme Court rejected the USEPA's arguments that voluntary programs already in place were sufficient to address global warming and that the USEPA should not take action on climate change because it may conflict with the initiatives or negotiations of other agencies and the President. On May 14, 2007, in response to the ruling, the Bush Administration issued an executive order directing the USEPA and Departments of Transportation and Energy to work together to establish regulations that reduce GHG emissions from motor vehicles, non-road vehicles, and non-road engines by 2008. However, the order does not specify what level of reductions these regulations need to achieve or how they will achieve them. It does state that any regulation needs to also take into account sound scientific knowledge, cost-benefit analysis, public safety, and economic growth.

While to date White House and USEPA action on climate change have not required reporting or reductions on the part of businesses or individuals, several bills have been introduced to the U.S. Congress that would establish mandatory GHG reporting and/or emissions reductions. In the current 110th Congress, four such bills have been introduced in the Senate and one in the House of Representatives.[26]

As of June 1, 2007, four major bills have been introduced in the Senate (see, **Table TR8-1, Comparison of Bills Introduced in the Senate to Control GHG Emissions**, for comparison):

- S. 280: The Climate Stewardship and Innovation Act of 2007 (Senator Lieberman);
- S. 309: The Global Warming Pollution Reduction Act (Senator Sanders);
- S. 317: The Electric Utility Cap and Trade Act of 2007 (Senator Feinstein); and
- S. 485: The Global Warming Reduction Act of 2007 (Senator Kerry).

Generally speaking, the bills share many features; most notably, all establish or enable a market-based system of tradable emissions allowances as at least one means of implementing overall reductions in GHGs. Market-based, or cap-and-trade, systems work by establishing a cap on the total amount of GHG emissions that will be allowed in a time period and distributing emissions allowances that are provided in some manner (typically an allocation or auction scheme) to emitting facilities. All emitting facilities must submit an allowance for each unit of CO_2 they produce. If a facility is emitting more CO_2 than they have covered by allowances, they must choose between spending money to invest in CO_2-mitigating technologies to reduce their emissions or purchasing additional allowances from facilities that are emitting less CO_2 for which they have allowances. The goal of these systems is to achieve a specified

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26 http://frwebgate.access.gpo.gov/cgi-bin/BillBrowse.cgi?dbname=110_cong_bills&wrapperTemplate=all110bills_wrapper.html&billtype=all (incorporated by reference).

overall reduction in emissions in the most cost-effective way possible. Such programs have proved successful in the past, such as the SO_2 cap-and-trade program implemented to control acid rain.

The Climate Stewardship and Innovation Act of 2007 (S. 280) aims to sufficiently reduce GHG emissions by 2050 to "forestall catastrophic climate change;" this is achieved by reducing the number of GHG emission allowances through 2049 to 2,096 million metric tons of CO_2 equivalent (MMTCDE). The Global Warming Pollution Reduction Act (S. 309) proposes to amend the Clean Air Act and ultimately reduce aggregate net United States global warming pollution to 80 percent below the 1990 level by 2050. It establishes specific emission reduction requirements on motor vehicles and electricity generation facilities. The Electric Utility Cap and Trade Act of 2007 (S. 317) also proposes to amend the Clean Air Act, but its emission reduction requirements and allowance trading program is focused on facilities with nameplate capacities greater than 25 megawatts (MW) that retail electricity they produce by combusting fossil fuels that emit GHGs. The bill requires a reduction in GHG emissions of "affected units" to 2001 levels by 2015, followed by a 1 percent annual reduction in emissions through 2020 and then a 1.5 percent annual reduction in emissions after 2020. The Global Warming Reduction Act of 2007 (S. 485), also proposing to amend the Clean Air Act, seeks to reduce GHG emissions to 65 percent below 2000 levels by 2050. It also establishes specific emission reduction requirements for motor vehicles and electricity generation facilities.

Besides stipulations about motor vehicle and power plant emissions, none of the bills proposes specific measures on other sectors or industries; however, the Global Warming Reduction Act of 2007 does stipulate that regulations specific to a certain source or sector can be promulgated and that the cap will only apply to sources and sectors with the greatest global warming potential, the most cost-effective means to reduce GHG emissions, or "other characteristics the [EPA] Administrator determines make the source or sector appropriate for inclusion in the program." In addition, if a market-based system is established, S. 309 confers benefits in the form of emissions allowances on highly energy-efficient communities to encourage an earlier transition to less carbon-intense living. S. 317 establishes offset credits, for which 16 types of operations, including landfills and cement manufacturing facilities, would be eligible.

All of the bills contain various other provisions for endeavors such as advanced technology research, exploring carbon sequestration opportunities, other incentive financing and updating of the scientific consensus on what are safe levels of GHG emissions.

Table TR8-1
Comparison of Bills Introduced in the Senate to Control GHG Emissions

	S. 280	S. 309	S. 317	S. 485
Applicability of Legislation	Electricity, Transportation, Industry and Commercial	EPA to determine covered sectors; mandatory standards for electricity and vehicles	Electricity	EPA to determine covered sectors; mandatory standards for electricity, vehicles and gasoline suppliers
Emissions Reduction	1990 emissions by 2020; 40% of 1990 levels for 2050+	1990 emissions by 2020; 20% of 1990 levels by 2050	61% of 2001 emissions from affected units by 2050	1990 emissions by 2020; ~38% of 1990 levels by 2050
Establishment of Cap-and-Trade System	Economy-wide absolute GHG cap-and-trade system	Cap-and-trade system optional; economy-wide absolute GHG cap	Absolute cap-and-trade system for power sector	Economy-wide absolute GHG cap-and-trade system
Potential for Banking/ Borrowing	Banking permitted; some borrowing allowed	Left to EPA's discretion	Banking permitted; EPA may authorize borrowing	Banking permitted; no borrowing provision
Auction or Free-Allocation?	Combination	Left to EPA's discretion	Increasing proportion of allowances to be auctioned until 2036 when all are auctioned	Left to discretion of President or Congress

The Climate Stewardship Act of 2007, introduced to the House of Representatives by Representative Olver as H.R. 620, would establish a national GHG database and a national market-based emissions trading system that would ultimately limit allowances to 1,504 Million Metric Tons of Carbon Dioxide Equivalents (MMTCDE) by 2050.

The potential exists for new federal legislation to conflict with preexisting state or local regulations on climate change. S. 309 and S. 485 address an aspect of this issue explicitly, stating that the proposed legislation would not supersede any more stringent energy efficiency or renewable energy standards that may have been established by state governments. S. 309 further states that, "[n]othing in this title affects the ability of a State to take State actions to further limit climate change;" yet, the bill also notes that vehicle standards will still be subject to the provisions of the Clean Air Act. Neither S. 280 nor S. 317 includes an explicit clause indicating that more stringent state regulations would still be allowed under the proposed law's provisions, but S. 280 makes passing reference to this possibility in discussing the allocation of emissions allowances.

Regional Agreements

In the absence of federal action to control GHG emissions, two regional agreements have been established among states, which have set their own limits on acceptable emission levels. The first such initiative, the Regional Greenhouse Gas Initiative (RGGI) was begun in 2003 and signed into law by seven northeastern states (Connecticut, New Hampshire, Delaware, New Jersey, Maine, New York, and Vermont) in December 2005.[27] Since then, two more states (Massachusetts and Rhode Island) have become signatories and Maryland will join in mid-2007. The RGGI was created to discuss the design of a regional cap and trade program for CO_2 emissions from power plants with a nameplate capacity greater than 25 MW that use at least 50 percent fossil fuels to generate their power. The cap and trade program will be mandatory for all applicable power plants in the signatory states.

A more recent agreement is the Western Regional Climate Action Initiative, signed in February 2007 by Washington, Oregon, California, Arizona, and New Mexico.[28] Within six months of signing the initiative, the states will set an overall regional goal for GHG reductions that is consistent with each state's goals. By August 2008, the states will have designed a regional market-based multi-sector mechanism for reducing GHG emissions, such as a load-based cap and trade program.

California Legislation

Concern about the disproportionately negative impacts global warming is expected to have on the California environment and economy has led the California State Assembly to pass two bills in the past five years. These bills are aimed at controlling and reducing the emission of GHGs to slow the effects of global warming.

Assembly Bill No. 1493 (AB 1493) was signed into law by Governor Schwarzenegger on July 22, 2002. This legislation mandated that the California ARB adopt regulations by January 1, 2005 that result in the achievement of the "maximum feasible" reduction in GHG emissions from vehicles used in the state primarily for noncommercial personal transportation.[29] The regulations were to become effective after January 1, 2006 and apply to passenger vehicles and light-duty trucks manufactured for the 2009 model year or later. AB 1493 prohibited the ARB from requiring in these regulations any additional tax on vehicles, fuel, or driving distance, a ban on the sale of certain vehicle categories, a reduction in vehicle weight, or a limitation on or reduction of speed limits and vehicle miles traveled.

In September 2004, ARB adopted regulations pursuant to AB 1493 that established GHG emissions standards and incorporated those standards into the Low-Emission Vehicle (LEV) program. The

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27 http://www.rggi.org/ (incorporated by reference).

28 http://www.climatechange.ca.gov/documents/2007-02-26_WesternClimateAgreementFinal.pdf (incorporated by reference).

29 www.calcleancars.org/ab1493.pdf (incorporated by reference).

regulations set fleet-wide average GHG emissions requirements for two vehicle categories, passenger car/light duty truck 1 (PC/LDT1) and light-duty truck 2 (LDT2). The new standards take into account the different GWP of the several GHGs emitted by motor vehicles and are, therefore, measured in units of CO_2e. These standards phase in during the 2009 through 2016 model years, with gradual reductions required from year to year. By 2016, the fleet-wide average GHG emission standard is set as 205 grams (g) of CO_2e/mile for the PC/LDT1 category and 332 g of CO_2e/mile for the LDT2 category. These standards are anticipated to produce a nearly 30 percent decrease in GHG emissions from light-duty vehicles by 2030.

In December 2004, these regulations were challenged in federal court by the Alliance of Automobile Manufacturers, who claimed that the law regulated vehicle fuel economy, a duty assigned to the federal government. The case had been put on hold by a federal judge in Fresno pending the U.S. Supreme Court's decision in *Massachusetts v. EPA, et al*.[30] The U.S. Supreme Court's ruling in favor of the state of Massachusetts has been discussed as a likely vindication of state efforts to control GHG emissions, though there has not yet been a decision regarding AB 1493. Before these regulations may go into effect, the USEPA must grant California a waiver under the federal Clean Air Act, which ordinarily preempts state regulation of air quality standards. Following the issuance of the *Massachusetts v. EPA, et al*. decision, the USEPA announced that it will decide whether to grant California a waiver by December 2007.

Citing concerns similar to those enumerated in AB 1493, the California State Assembly passed the California Global Warming Solutions Act of 2006 in August 2006.[31] Also known as Assembly Bill 32 (AB 32), the law instructs the ARB to set new reporting requirements for GHG emissions and to devise rules and regulations that will achieve the maximum technologically feasible and cost-effective GHG emissions reductions, achieving a reduction in statewide GHG emissions to 1990 levels by 2020, and further reductions in future years. While AB 32 sets out a timeline for the adoption of measures to evaluate and reduce GHG emissions across all source categories, it does not itself stipulate these measures; instead, these measures will be determined in subsequent processes. Thus, the specific GHG emission reduction measures that will be required of facilities as result of the passage of AB 32 are not yet known. AB 32 does stipulate what compounds will be considered GHGs and thus subject to reductions; these compounds include CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6, the same pollutants considered under the international Kyoto Protocol.

The first action ARB will take as a result of AB 32 is to enumerate discrete early action measures to reduce GHG emissions by June 30, 2007. By January 1, 2008, ARB will both establish the 1990 level of state GHG emissions that will serve as the target level for 2020 emissions and adopt regulations requiring the

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30 http://www.sfgate.com/cgi-bin/article.cgi?f=/c/a/2007/04/02/BAG06P06BN3.DTL (incorporated by reference).

31 http://www.arb.ca.gov/cc/docs/ab32text.pdf (incorporated by reference).

reporting and verification of statewide GHG emissions. Source categories that contribute the most to statewide emissions will be the first having to comply with these monitoring and reporting requirements. These source categories have not yet been identified but are likely to include oil refineries, cement plants, power utilities/generators, and large stationary combustion sources (emitting greater than 25,000 metric tons CO_2 per year). By January 1, 2009, ARB will approve a scoping plan to achieve the maximum technologically feasible and cost effective GHG emissions reductions necessary to meet the 2020 goal. Regulations implementing the discrete early action GHG emission reduction measures will be adopted by January 1, 2010. Regulations adopting GHG emission limits and necessary emission reduction measures to achieve the 2020 statewide emissions limit will be adopted by January 1, 2011; these regulations could include a market-based emission limit system. The regulations adopted in 2011 will become operative on January 1, 2012. By January 1, 2014 and every five years thereafter, ARB will update its scoping plan.

ARB intends to allow extensive public participation in the development of regulations required by AB 32. Workshops and public meetings to discuss various aspects of the law and receive input from stakeholders are already underway. In addition, a number of issues surrounding AB 32 still must be resolved. For example, it is not yet clear how the ARB will coordinate the development of the AB 32 program with other state and regional programs, nor is it clear how the program will be coordinated with any federally mandated programs that may develop.

Agency Actions Relevant to Residential Developments

There are several measures underway and additional stakeholder suggestions under consideration by the ARB and the Climate Action Team (CAT)[32] for early action GHG reduction measures that are relevant to the residential development sector. Many of these measures target energy efficiency in buildings and appliances. Measures underway by the ARB and CAT that relate to residential development are listed in **Table TR8-2, Early Action GHG Reduction Measures Considered by ARB and CAT (Landmark Village)**, and stakeholder suggestions related to residential development are listed in **Table TR8-3, Stakeholder Suggestions Potentially Relevant to the Residential Development Sector (Landmark Village)**.

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32 The CAT was formed as a result of Executive Order S-3-05 (June 1, 2005), which directed the Secretary of the CalEPA to coordinate with the Secretary of the Business, Transportation and Housing Agency, Secretary of the Department of Food and Agriculture, Secretary of the Resources Agency, Chairperson of the Air Resources Board, Chairperson of the Energy Commission, and the President of the Public Utilities Commission to meet specific GHG emission levels in the future. While AB 32 charges the ARB with monitoring and regulating sources of emissions of GHGs, the CAT has the responsibility of coordinating California's overall climate policy across the various state agencies.

Table TR8-2
Early Action GHG Reduction Measures Considered by ARB and CAT (Landmark Village)

California Air Resources Board	
Group 2: GHG Reduction Measures Underway or to be Initiated by ARB by 2009	
•	Strategies on the use of light-covered paving, cool roofs, and shade trees to decrease energy requirements for buildings
Climate Action Team	
Group 1: Discrete Early Action Measures	
California Energy Commission	
•	Energy Efficient Building Standards: The CEC has been actively engaged in its "Building Energy Efficiency Standards in Progress" effort. The next phase of the project is to conduct public workshops on mark-ups of the "Express Terms" of the Standards, plus the supporting technical rules for software developments and the extensive technical data appendices that are required for showing compliance. The CEC intends to adopt these regulations in 2008.
•	Energy Efficient Appliance Standards: The CEC is considering options for light bulb standards and anticipates adopting standards by January 1, 2010.
•	New Solar Homes Partnership: Effective January 2007, approved solar systems will receive incentive funds based on system performance above building standards.
Group 2: Additional Early Actions Measures to Reduce GHGs Already Underway or to be Initiated by CAT in 2007-2009	
California Energy Commission	
•	Appliance Energy Efficiency Standards in Place: The CEC will update its appliance regulations to re-institute appliance and equipment certification and data collection.

Notes:

The ARB has organized its early action GHG reduction measures into three groups:

Group 1: These are also known as "discrete early action" measures as defined by AB 32. These measures must be listed by June 30, 2007 and be enforceable by January 1, 2010.

Group 2: These are defined as other GHG reduction measures that may not be ready to be listed by the ARB by June 30, 2007 and/or implemented by January 2010.

Group 3: These are strategies that are specifically targeted at criteria pollutants or air toxics that have climate co-benefits.

The CAT has used similar definitions in the grouping of their early action measures. However, it should be noted that the CAT has no legal responsibility to enumerate early actions under AB 32.

Sources:

ARB (2007). Proposed Early Actions to Mitigate Climate Change in California. Draft Staff Report. April 20, 2007.
CAT (2007). Climate Action Team Proposed Early Actions to Mitigate Climate Change in California. April 2007.

Table TR8-3
Stakeholder Suggestions Potentially Relevant to the Residential Development Sector (Landmark Village)

ID No.	Description of Strategy	
Suggestions under ARB Jurisdiction		**Status/Agency Assigned**
A-21	Require the electrification of construction equipment at urban sites.	Deferred to Scoping Plan.
Suggestions for the CAT from the ARB		
B-4	Water efficiency standards for new residential and non-residential construction	CEC
B-5	Increase building insulation standards/insulation improvements	CEC
B-10	Material-specific disposal limits to require all Californians to limit their disposal of recyclable materials such as cardboard, paper, or construction and demolition debris	CIWMB
B-15	Free provision and installation of solar panels for residential and commercial building.	CEC
B-38	GHGs in General Plans and CEQA	ARB/Resources
B-40	Standards for standby electric use (for appliances that are plugged in)	CEC
B-41	Water conservation	DWR/CEC/CPUC
B-42	Water supply planning	DWR
B-43	Water re-use	DWR/SWRCB

Abbreviations:
ARB = California Air Resources Board
CAT = Climate Action Team
CEC = California Energy Commission
CPUC = California Public Utilities Commission
CIWMB = California Integrated Waste Management Board
DWR = Department of Water Resources
GHG = greenhouse gas
SWRCB = State Water Resources Control Board

Sources:
ARB (2007). Proposed Early Actions to Mitigate Climate Change in California. Draft Staff Report. April 20.

4. Project Design Features to Reduce GHG Emissions

Identification of Potentially Applicable Project Design Features

While specific standards on GHG emissions do not yet exist for residential developments in California, there are measures that can be implemented to reduce GHG emissions associated with the Landmark Village project.

To limit GHG emissions during the construction phase of the project, potential measures include using energy efficient construction equipment and promoting worker carpooling options for construction workers. The potential use of bio-diesel might result in some GHG reductions, although this also results in increases in emissions of oxides of nitrogen, a criteria pollutant. Measures also involve enhanced planting of trees in the Landmark Village development.

As motor vehicle use accounts for roughly half of GHG emissions from residential developments, this is a sector where GHG reduction measures could have a beneficial effect. Potential traffic reduction measures include providing bicycle lanes and sidewalks, increasing net residential density, creating mixed-use communities (jobs in close proximity to homes), situating retail land within 0.5 mile of a commercial center, and accommodating public transportation.

The remaining major source of GHG emissions in Landmark Village is energy use in residential housing and commercial floor area. Effective measures to reduce GHG emissions vary depending on climate. Measures relevant to Landmark Village include energy efficiency measures designed for hot, sunny, and dry climates; implementing the measures listed below can result in significant energy savings beyond the energy saved by complying with current Title 24 requirements.[33] Measures include options in housing development design, options in building design, and choices in appliances and power generation

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[33] Title 24, Part 6, of the California Code of Regulations governs California's "Energy Efficiency Standards for Residential and Nonresidential Buildings." The standards were established in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and incorporation of new energy efficiency technologies and methods. According to the California Energy Commission, California's building efficiency standards (along with those for energy-efficient appliances) have saved more than $56 billion in electricity and natural gas costs since 1978. It is estimated the standards will save an additional $23 billion by 2013. See, California Energy Commission website at http://www.energy.ca.gov/title24, accessed on July 17, 2007 (incorporated by reference). The California Energy Commission adopted 2005 changes to the standards on November 5, 2003, and the Building Standards Commission adopted them on July 21, 2004. The new standards have been in effect since October 1, 2005 for both residential and nonresidential buildings.

options.[34] Building design options such as using energy efficient window glazing,[35] wall insulation[36] and ventilation systems, as well as placing overhangs on windows to minimize exposure to summer sun,[37] can reduce energy demand and thus GHG emissions. Other options include the installation of ENERGY STAR appliances,[38] low-energy lighting in residences.[39] Many of these same measures could be utilized in the elementary school building and commercial buildings.[40]

Application of Project Design Features to Newhall Ranch, Including Landmark Village, to Reduce GHG Emissions

The project applicant, The Newhall Land and Farming Company (Newhall), has considered the above potential project design features, and has applied many such features into the design of the approved Newhall Ranch Specific Plan and the first village within Newhall Ranch, the Landmark Village project. As shown below, Landmark Village, as with all of Newhall Ranch, will incorporate the components of a sustainable community, including the following:

- **Mix of Land Uses.** Landmark Village, along with the other villages in Newhall Ranch, will include a broad range of housing types, including affordable housing, along with commercial, office, and public facilities. As to Landmark Village, a diverse range of 1,444 homes (308 single-family and 1,136 multi-family units) would be provided. To minimize and shorten vehicle trips, most homes will be within walking distances to the Landmark Village community's commercial and mixed-use areas, elementary school site, community park, and trail system. Finally, Landmark Village is located adjacent to the Valencia Commerce Center, one of the largest employment centers in the Santa Clarita Valley. Bike and pedestrian trails within Newhall Ranch and Landmark Village will connect to trails within the Valencia Commerce Center.

- **Provision of Jobs.** A portion of Newhall Ranch's projected 19,000 new jobs would be offered through Landmark Village's mixed-use and commercial areas. Newhall Ranch is adjacent to the existing Valencia Gateway (which includes the Valencia Commerce Center), which presently provides 50,000 jobs. Other development within Valencia Gateway will create an additional 30,000 jobs. When completed, the job centers in Newhall Ranch and Valencia will have resulted

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34 Building America Best Practices Series: Volume 2 - Builders and Buyers Handbook for Improving New Home Efficiency, Comfort, and Durability in the Hot-Dry and Mixed-Dry Climates. Available online at: http://www.eere.energy.gov/buildings/building_america/pdfs/38360.pdf; see also, estimates from U.S. Department of Energy: http://www.eere.energy.gov/consumer/your_home/.

35 Energy savings from energy efficient windows can be found online at: http://www.efficientwindows.org/factsheets/california.pdf. Specific case studies for Los Angeles and other California locations lists energy savings from different window types.

36 ENERGY-10 software simulations.

37 Description of how to design window overhangs available on the U.S. Department of Energy - Energy Efficiency and Renewable Energy website: http://www.eere.energy.gov/buildings/info/documents/pdfs/29236.pdf

38 ENERGY STAR refrigerators use 15% less energy than current federal standards, and 40% less energy than conventional models sold in 1991: http://www.energystar.gov/index.cfm?c=refrig.pr_refrigerators

39 http://www.eere.energy.gov/consumer/your_home/water_heating/index.cfm/mytopic=12860

40 See design strategies specific for schools in hot climates: http://www.nrel.gov/docs/fy02osti/32103.pdf

in the creation of approximately 100,000 jobs in the Santa Clarita Valley. A balanced jobs-housing base is a critical component to a sustainable community because it allows people to work close to home and minimizes vehicle miles traveled.

- **Locating of Residential Uses in Close Proximity to Commercial Services/Public Spaces.** Nearly 60 percent of the residential units in Newhall Ranch will be located within walking distance of village or commercial centers. This is clearly documented by the Landmark Village land plan. Residents within Landmark Village will be able to utilize paseos/trails and/or the Santa Clara River Regional Trail to walk to commercial centers, private recreational facilities, the elementary school and a community park. As stated above, this traditional neighborhood design minimizes vehicle trips.

- **Provision of Transit and Light Rail Right-of-Way.** Newhall Ranch, including Landmark Village, will be part of the Santa Clarita Transit system and will pay its fair share for transit service to the community. Transit improvements within Newhall Ranch will include a park-and-ride lot, a future transit station, transfer station, bus stops, and preservation of light rail right-of-way. Landmark Village will include a total of five bus stops, a park-and-ride lot, and the preservation of light rail right-of-way along SR-126. The provision of transit and the accommodation of light rail encourage residents to rely less on vehicular travel.

- **Open Space, Recreation, and Preservation of Sensitive Resource Areas.** Newhall Ranch, of which Landmark Village is a part, includes the preservation of the High Country, Salt Creek Corridor and the Santa Clara River and internal open areas - a total of nearly 7,800 acres. A total of three community parks (Landmark includes the first) and up to ten neighborhood parks will be provided as part of Newhall Ranch. Finally, private recreation facilities will be provided throughout the entire Ranch providing additional recreational opportunities to residents. In short, Landmark Village's design connects jobs, retail, schools, parks, and recreation facilities with the community's trail system to promote walking and biking while minimizing vehicle trips.

- **Hierarchy of Trails.** Newhall Ranch will include over 50 miles of trails to encourage pedestrian mobility. Landmark Village includes a 2-mile extension of the Santa Clara River trail, with direct connections to residential, commercial, and park uses, and various paseos including the paseo running along "A" Street or the Landmark Village Spine Road. This design also is intended to minimize vehicle trips.

- **Reducing Impermeable Surfaces.** To curtail urban runoff and maximize groundwater recharge, Newhall Ranch, including Landmark Village, will utilize open/soft bottom channels, smaller street sections, where possible, increased native landscape areas, and non-structural water quality treatment improvements.

- **Water Conservation and Re-Use.** Newhall Ranch, including Landmark Village, will utilize native, drought-tolerant plants in the community's landscaping, use recycled water for irrigation, and evapotranspiration controllers (i.e., weather-sensitive sprinklers) to reduce potable water demand and runoff.

- **Traffic/Transportation Improvements.** Landmark Village's traffic circulation plan, which is consistent with all of Newhall Ranch, minimizes vehicle trips and reduces GHG emissions

through the design of internal roads in conjunction with homes, school site, commercial areas, and trail system. Transit is included in the traditional neighborhood design, and it includes a park-and-ride lot and bus stops. Additionally, a 5-mile right-of-way for a potential Metrolink light rail extension is accommodated along SR-126. Trails and bike paths leading to close-to-home jobs, neighborhood-serving retail, and the school encourage residents to reduce vehicle miles traveled. The applicant also has committed to fund $300 million in roadway improvements in the Santa Clarita Valley in conjunction with the Newhall Ranch Specific Plan, including Landmark Village, to improve traffic movement and circulation.

The project applicant also has prepared a "Sustainability Summary" for Landmark Village that identifies the above project design features and includes green building measures. This summary is found in **Appendix F** of this Final EIR.

Adoption of Existing Mitigation Measures that Reduce GHG Emissions and Promote Sustainability

Finally, the previously certified Newhall Ranch Specific Plan Program EIR contains adopted, existing mitigation measures that contribute to reductions in GHG emissions and promote sustainable development. Selected mitigation measures, taken from the Specific Plan's adopted Mitigation Monitoring Plan, include:

Flood/Hydrology

Mitigation Measures 4.2-5, 4.2-6, 4.2-7, and 4.2-8

Biota

Mitigation Measures 4.6-1, 4.6-5, 4.6-6, 4.6-7, 4.6-11, 4.6-13, 4.6-15, 4.6-17, 4.6-18, 4.6-19, 4.6-22, 4.6-23, 4.6-24, 4.6-25, 4.6-26, 4.6-26a, 4.6-37, 4.6-38, 4.6-41, 4.6-42, 4.6-43, 4.6-48, 4.6-49, 4.6-50, 4.6-51

Traffic/Access

Mitigation Measures 4.8-1, 4.8-5, 4.8-11, 4.8-12

Air Quality

Mitigation Measures 4.10-1, 4.10-2, 4.10-3, 4.10-4, 4.10-5, 4.10-6, 4.10-11, 4.10-12, 4.10-14

Water Resources

Mitigation Measures 4.11-1, 4.11-2, 4.11-3, 4.11-4, 4.11-16

Wastewater Disposal

Mitigation Measures 4.12-1, 4.12-2

Fire Services and Hazards

Mitigation Measures 4.18-1, 4.18-4

Education

Mitigation Measure 4.16-1

Parks, Recreation and Trails

Mitigation Measures 4.20-1, 4.20-2

Electricity/Utilities

Mitigation Measure 4.14-1

Additional Conditions of Approval

Condition (g)

TOPICAL RESPONSE 9: GROUNDWATER SUPPLIES AND "OVERDRAFT" CLAIMS

1. Introduction

Comments have stated that the groundwater supplies referenced in the Landmark Village Draft EIR exceed the "safe yields" of the Alluvial aquifer and the Saugus Formation and that water levels are decreasing resulting in "overdraft" conditions. Associated with these comments is the stated concern that by relying upon an "overdrafted" groundwater basin, the water purveyors in the Santa Clarita Valley have "overstated" available groundwater supplies. In response, as confirmed by the Landmark Village Draft EIR, Section 4.10, Water Service, pp. 4.10-28–29 and 4.10-32–33, and several updated plans, studies, and reports prepared by qualified experts, there is no evidence of any historic or recent trend toward permanent water level or storage decline in the basin; as a result, there has been no "overdraft" of either aquifer system. In addition, based on the best available data, Castaic Lake Water Agency (CLWA) and the local purveyors recently affirmed the groundwater operating plan utilized in the 2005 Urban Water Management Plan (UWMP), which was adopted by CLWA and the purveyors for the CLWA service area in December 2005.[1] The groundwater operating plan also has been verified by numerous studies over the years, including the 2006 Santa Clarita Valley Water Report;[2] 2005 Basin Yield Report;[3] 2005 UWMP, Appendix C, Groundwater Resources and Yield in the Santa Clarita Valley;[4] 2003 Groundwater Management Plan;[5] and the 2001 Update Report, Hydrogeologic Conditions in the Alluvial and Saugus Formation Aquifer Systems.[6]

2. Background

For most residents of the Santa Clarita Valley (Valley), domestic water service is provided by four retail water purveyors. They are the CLWA's Santa Clarita Water Division (SCWD), Los Angeles County Waterworks District 36 (LA36), Newhall County Water District (NCWD), and Valencia Water Company

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1 The 2005 UWMP was challenged in a lawsuit filed in early 2006 by the California Water Impact Network and the Friends of the Santa Clara River, ultimately seeking a mandate order invalidating approval of the UWMP by CLWA and the purveyors. On August 3, 2007, Los Angeles County Superior Court Judge Dzintra Janavs ruled in favor of CLWA and the retail water purveyors to uphold the validity of the 2005 UWMP. An appeal has not yet been filed in connection with the trial court decision. Please see **Appendix B** of this Final EIR for a copy of Judge Janavs decision. The 2005 UWMP remains valid unless affected by a future court judgment or order.

2 The 2006 Santa Clarita Valley Water Report is found in **Appendix B** of this Final EIR.

3 The 2005 Basin Yield Report is found in the Landmark Village Draft EIR, Appendix 4.1**0**.

4 CLWA's 2005 UWMP is found in the Landmark Village Draft EIR, Appendix 4.10.

5 The 2003 Groundwater Management Plan is found in the Landmark Village Draft EIR, Appendix 4.10.

6 The 2001 Update Report, Hydrogeologic Conditions in the Alluvial and Saugus Formation Aquifer Systems is found in the Landmark Village Draft EIR, Appendix 4.10.

(VWC). Together, as of 2006, the purveyors provide water to nearly 68,000 service connections. CLWA contracts with the California Department of Water Resources (DWR) for State Water Project (SWP) water from Castaic Lake where it is treated, filtered, and disinfected at two treatment plants before distribution to the purveyors.[7] Staff of these entities meet regularly to coordinate the supply of water in the Valley.

Water supply for a small fraction of Valley residents is provided by individual private water supply wells. The locations, construction details, annual pumpage and other information about these private wells are not currently available. CLWA has been working with private well owners to receive information about their wells for incorporation in future reports and for planning purposes. Pumping as reported in the 2006 Santa Clarita Valley Water Report includes an estimate of groundwater pumped from private wells; it is expected that this estimate will be refined in the future as more information about the private wells is obtained.

In addition to municipal and individual private water uses in the Valley, there remains an agricultural water demand that is predominately dependent on local groundwater for its water supply. Accordingly, on-going agricultural water requirements and the use of local groundwater to meet those requirements are considered in reports on water supplies.

Over the last 20 years, CLWA and the purveyors have reviewed and reported on the availability of water supplies to meet all water requirements in the Valley. Those reports also have addressed local water resources, most notably groundwater, in the region. Past studies have assessed the condition of local groundwater aquifers, their hydrogeologic characteristics, aquifer storage capacity, operational yield and recharge rate, groundwater quality and contamination, and the on-going conjunctive use of groundwater and imported water resources.

Other efforts have included developing drought contingency plans, coordinating emergency response procedures and implementing Valley-wide conservation programs. In 1985, the purveyors prepared the area's first UWMP. Information in the plan was coordinated among CLWA and the purveyors to provide accurate, comprehensive, and consistent water supply and demand information for long-term planning purposes. In accordance with the state Urban Water Management Planning Act, the Valley-wide UWMP was most recently updated in 2005 to extend water demand projections through 2030, and to describe the combination of local groundwater, imported water supplies from the SWP, local recycled water supplies, and planned other water supplies to meet the existing and projected water demands in the Valley. The 2005 UWMP describes the reliability of local groundwater resources and the adequacy of groundwater supplies to meet that component of overall water supply. The 2005 UWMP also describes the impacts of

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7 It should be noted that the Landmark Village project does not rely on SWP supplies from CLWA. The project will use local groundwater from the Alluvial aquifer and recycled water from the Newhall Ranch WRP.

perchlorate contamination on several municipal water supply wells, and the plans and on-going work for integrated control of perchlorate migration and full restoration of perchlorate-impacted groundwater supply.

3. The Upper Santa Clara River Hydrologic Area and East Groundwater Subbasin

The Upper Santa Clara River Hydrologic Area (HA), as defined by DWR, is located almost entirely in northwestern Los Angeles County. The area encompasses about 654 square miles comprised of flat valley land (about 6 percent of the total area) and hills and mountains (about 94 percent of the total area) that border the Valley area. The mountains include the Santa Susana and San Gabriel Mountains to the south and the Sierra Pelona and Leibre-Sawmill Mountains to the north. Elevations range from about 800 feet on the Valley floor to about 6,500 feet in the San Gabriel Mountains. The headwaters of the Santa Clara River are at an elevation of about 3,200 feet at the divide separating this hydrologic area from the Mojave Desert.

The Santa Clara River and its tributaries flow intermittently from Lang Station westward about 35 miles to Blue Cut, just west of the Los Angeles County/Ventura County line, where it forms the outlet for the Upper Santa Clara River Hydrologic Area. The principal tributaries of the Santa Clara River in the Santa Clarita Valley are Castaic Creek, San Francisquito Creek, Bouquet Creek, and the South Fork of the Santa Clara River. In the Santa Clarita Valley, the Santa Clara River receives treated wastewater discharge from the existing Saugus and Valencia Water Reclamation Plants (WRPs), which are operated by County Sanitation Districts of Los Angeles County.

The Santa Clara River Valley East Groundwater Subbasin, beneath the Santa Clarita Valley in the Upper Santa Clara River HA, is the source of essentially all local groundwater used for water supply in the Santa Clarita Valley. Below Blue Cut, the Santa Clara River continues westward through Ventura County to its mouth near Oxnard. Along that route, the River traverses all or parts of six groundwater basins in Ventura County (Piru, Fillmore, Santa Paula, Oxnard Forebay, Oxnard Plain and Mound).

There are two primary precipitation gages in the Santa Clarita Valley, the Newhall-Soledad 32c gage and the NCWD gage. The National Climatic Data Center (NCDC) and Los Angeles County Department of Public Works (LACDPW) have maintained records for the Newhall-Soledad 32c gage since 1931. The NCWD has maintained records for the NCWD gage since 1979. The cumulative records from these two gages correlate very closely, with the NCWD gage recording approximately 25 percent more precipitation than the Newhall-Soledad 32c gage. This is likely due to the location of the NCWD gage, which is at the base of the mountains rimming the southern edge of the Santa Clarita Valley.

The Santa Clarita Valley is characterized as having an arid climate. Historically, intermittent periods of less-than-average precipitation have typically been followed by periods of greater-than-average precipitation in a cyclical pattern, with each wetter or drier period typically lasting from one to five years. The long-term average precipitation is 18.1 inches (1931–2006). In general, periods of less-than-average precipitation have been longer and more moderate than periods of greater-than-average precipitation. Recently, the periods from 1971 to 1976, 1984 to 1991 and 1999 to 2003 have been drier than average; the periods from 1977 to 1983 and 1992 to 1996 have been wetter than average. Wet conditions that began in late 2004 continued into early 2005. Significant storm events in January 2005 produced over 13 inches of measured precipitation, or more than 70 percent of average annual precipitation in the first month of the year. Significant storm events continued in February 2006, resulting in nearly 17 inches of additional measured precipitation, or nearly 100 percent of average annual precipitation in February alone. In total, 2005 had about 37 inches of measured precipitation, or slightly more than 200 percent of long-term average precipitation. Those significantly wet conditions contributed to substantial groundwater recharge and decreased water demand that year. In contrast, total precipitation in 2006 was slightly less than 14 inches, or about 4 inches below the long-term average, resulting in water requirements that can be described as "normal" (as projected in the 2005 UWMP) and no dramatic changes in groundwater conditions, as described in the 2006 Santa Clarita Valley Water Report.

4. Water Supplies – Groundwater Basin Yield

Prior to 1980, local groundwater extracted from the Alluvium and the Saugus Formation was the sole source of water supply in the Santa Clarita Valley. Since 1980, local groundwater supplies have been supplemented with imported SWP water supplies.[8] Those water supplies were further augmented by the initiation of deliveries from CLWA's recycled water program in 2003.

The groundwater basin, generally beneath the Santa Clarita Valley, identified in DWR's Bulletin 118 as the Santa Clara River Valley Groundwater Basin, East Subbasin (Basin No. 4-4.07), is comprised of two aquifer systems. The Alluvium generally underlies the Santa Clara River and its several tributaries, and the Saugus Formation underlies practically the entire Upper Santa Clara River area. The subbasin boundary approximately coincides with the outer extent of the Alluvium and Saugus Formation.

A 2001 Update Report on both the Alluvium and Saugus Formation Aquifers (Slade, 2002), which updated analyses and interpretation of hydrogeologic conditions from earlier reports (Slade, 1986 and 1988), included extensive detail on major aspects of the groundwater basin. Notable parts of the Update Report relative to groundwater supply included:

- Analysis of historical groundwater levels and production indicates that there have been no conditions that would be illustrative of groundwater overdraft;

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8 Please see footnote 7, above.

- Utilization of operational yield (as opposed to perennial yield) as a basis for managing groundwater production would be more applicable in this basin to reflect fluctuating utilization of groundwater in conjunction with imported SWP water;

- Operational yield of the Alluvium would typically be 30,000 to 40,000 acre-feet per year (afy) for wet and normal rainfall years, with an expected reduction into the range of 30,000 to 35,000 afy in dry years;

- Operational yield of the Saugus Formation would typically be in the range of 7,500 to 15,000 afy on a long-term basis, with possible short-term increases during dry periods into a range of 15,000 to 25,000 afy, and to 35,000 afy if dry conditions continue.

Following on the 2001 Update Report, the groundwater component of overall water supply in the Valley derives from a groundwater operating plan to meet water requirements (municipal, agricultural, small domestic), while maintaining the basin in a sustainable condition (i.e., no long-term depletion of groundwater or interrelated surface water). This operating plan also addresses groundwater contamination issues in the basin; all consistent with CLWA's adopted Groundwater Management Plan. The groundwater operating plan is based on the concept that pumping can vary from year-to-year to generally rely on increased groundwater use in dry periods and increased recharge during wet periods, and to collectively assure that the groundwater basin is adequately replenished through various wet/dry cycles.

The groundwater operating plan, summarized in **Table TR9-1, Groundwater Operating Plan for the Santa Clarita Valley**, below, is as follows:

> **Alluvium** – Pumping from the Alluvial aquifer in a given year is related to local hydrologic conditions in the eastern Santa Clara River watershed. Pumping is expected to typically range between 30,000 and 40,000 afy during normal and above-normal rainfall years. Due to hydrogeologic constraints in the eastern part of the Basin, pumping is expected to be typically reduced to between 30,000 and 35,000 afy during locally dry years.
>
> **Saugus Formation** – Pumping from the Saugus Formation in a given year is related to the availability of other water supplies, particularly from the SWP. During average-year conditions within the SWP system, Saugus pumping is expected to typically range between 7,500 and 15,000 afy. Planned dry-year pumping from the Saugus Formation is expected to range between 15,000 and 25,000 afy during a drought year and can increase to between 21,000 and 25,000 afy if SWP deliveries are reduced for two consecutive years, and between 21,000 and 35,000 afy if SWP deliveries are reduced for three consecutive years. Such high pumping is expected to typically be followed by periods of reduced (average-year) pumping, at rates between 7,500 and 15,000 afy, to further enhance the effectiveness of natural recharge processes that would recover water levels and groundwater storage volumes after the higher pumping during dry years.

Table TR9-1
Groundwater Operating Plan for the Santa Clarita Valley

	Groundwater Production (af)			
Aquifer	**Normal Years**	**Dry Year 1**	**Dry Year 2**	**Dry Year 3**
Alluvium	30,000 to 40,000	30,000 to 35,000	30,000 to 35,000	30,000 to 35,000
Saugus	7,500 to 15,000	15,000 to 25,000	21,000 to 25,000	21,000 to 35,000
Total	**37,500 to 55,000**	**45,000 to 60,000**	**51,000 to 60,000**	**51,000 to 70,000**

In 2004, as part of analyzing the restoration of perchlorate-impacted groundwater supply in the Valley, a numerical groundwater flow model was developed and calibrated for use in analyzing the response of the groundwater basin to long-term operation at the operational yields noted above, with focus on perchlorate extraction and the control of perchlorate migration in the basin. That groundwater flow model was then utilized in 2005 to specifically analyze the sustainability of groundwater supplies in both the Alluvium and the Saugus Formation through a long-term (78-year) hydrologic period that was selected to examine groundwater basin response to variations in pumping in accordance with the groundwater operating plan. Resultant projections of groundwater levels, groundwater storage, and surface water flows showed the basin to respond in a long-term sustainable manner, with no chronic depletion of groundwater levels, storage, or stream flows. The analysis of groundwater sustainability was summarized in the Basin Yield Report (CH2MHill and Luhdorff and Scalmanini Consulting Engineers, 2005), which included the following findings:

- The groundwater basin has historically been, and continues to be, in good operating condition and not in overdraft conditions, as indicated by historical data.

- The groundwater plan is sustainable over varying hydrologic conditions, because it is feasible to intermittently exceed a long-term average yield for one or more years without creating long-term adverse impacts to the groundwater system and the Santa Clara River.

- The groundwater operating plan for the Alluvium and the Saugus Formation can be used for long-term water supply planning purposes. In particular, although increased pumping from the Saugus Formation during dry periods can be expected to cause short-term declines in groundwater levels, it is not projected to cause permanent declines in groundwater discharges or streamflow. Saugus groundwater levels can be expected to recover to pre-drought conditions when pumping is reduced in subsequent wet to normal years.

- The strategy around which the groundwater operating plan was designed (maximizing the use of Alluvial Aquifer and imported water during years of normal or above-normal availability of these supplies, while limiting the use of the Saugus Formation during these periods, then temporarily

increasing Saugus pumping during years when SWP supplies are significantly reduced because of drought conditions) is viable on a long-term basis.

- The historical observations of basin conditions and the model simulations together support the historical and ongoing confidence that groundwater can continue to be a sustainable source of water supply under the groundwater operating plan.

5. Alluvium – General

The spatial extent of the aquifers used for groundwater supply in the Valley, the Alluvium and the Saugus Formation, are illustrated in Figure III-1 of the 2006 Santa Clarita Valley Water Report. Geologic descriptions and hydrogeologic details related to both aquifers are included in several technical reports, including Slade (1986, 1988 and 2002), the Basin Yield Report (CH2MHill and Luhdorff and Scalmanini Consulting Engineers (2005)), and the 2005 UWMP.

Consistent with the 2001 Update Report (Slade), the 2005 Basin Yield Report (CH2MHill and Luhdorff and Scalmanini Consulting Engineers), and the 2005 UWMP, the management practice of the purveyors continues to be to rely on groundwater from the Alluvium for part of the overall municipal water supply, whereby total pumping from the Alluvium (by municipal, agricultural, and small private pumpers) is in accordance with the groundwater operating plan, 30,000 to 40,000 afy in wet and normal years, with possible reduction to 30,000 to 35,000 afy in dry years. Such operation will maximize use of the Alluvium because of the aquifer's ability to store and produce good quality water on a sustainable basis, and because the Alluvium is capable of rapid recovery of groundwater storage in wet periods. As with many groundwater basins, it is possible to intermittently exceed a long-term average yield for one or more years without long-term adverse effects. Higher pumping for short periods may temporarily lower groundwater storage and related water levels, as has been the case in the Alluvium several times since the 1930s. However, subsequent decreases in pumping limit the amount of water level decline. Normal to wet-period recharge results in a rapid return of groundwater levels to historic highs. Historical groundwater data collected from the Alluvium over numerous hydrologic cycles continue to provide assurance that groundwater elevations, if locally lowered during dry periods, recover in subsequent average or wet years. Such water level response to rainfall is a significant characteristic of permeable, porous, Alluvial aquifer systems that occur within large watersheds. In light of these historical observations, complemented by the long-term sustainability analysis using the numerical groundwater flow model, there is on-going confidence that groundwater will continue to be a sustainable source of water supply at the rates of pumping described in the 2005 Basin Yield Report and the 2005 UWMP.

Long-term adverse impacts to the Alluvium could occur if the amount of water extracted from the aquifer were to exceed the amount of water that recharges the aquifer over an extended period. However, the quantity and quality of water in the Alluvium and all significant pumping from the Alluvium are

routinely monitored, and no long-term adverse impacts have ever been evident. Ultimately, the purveyors have identified cooperative measures to be taken, if needed, to ensure sustained use of the aquifer. Such measures include, but are not limited to, the continuation of conjunctive use of imported SWP water with local groundwater, artificial recharge of the aquifer with local runoff or other surface water supplies, financial incentives discouraging extractions above a selected limit, expanded use of other water supplies such as recycled water, and expanded implementation of demand-side management, including conservation.

6. Alluvium – Historical and Current Conditions

Total pumping from the Alluvium in 2006 was about 43,000 acre-feet (af), an increase of about 4,300 af from the preceding year. Total Alluvium pumping was thus slightly above the groundwater operating plan range. Of the total Alluvial pumpage in 2006, about 27,200 af (63 percent) was for municipal water supply, and the balance, about 15,800 af (37 percent), was for agriculture and other smaller uses, including individual domestic uses. Most of the increased pumping from the Alluvium in 2006, when compared to the preceding year, was attributable to an increase in pumping for agricultural irrigation. In a longer-term context, there has been a change in municipal/agricultural pumping distribution since SWP deliveries began in 1980, toward a slightly higher fraction for municipal water supply (from about 50 percent to more than 60 percent of Alluvial pumpage), which reflects the general land use changes in the area. Ultimately, on a long-term average basis since the importation of SWP water, total Alluvial pumping has been almost 31,500 afy, which is at the lower end of the range of operational yield of the Alluvium. The overall historic record of Alluvial pumping is illustrated in Figure III-2 of the 2006 Santa Clarita Valley Water Report.

Groundwater levels in various parts of the basin have historically exhibited different responses to both pumpage and climatic fluctuations. During the last 20 to 30 years, depending on location, Alluvial groundwater levels have remained nearly constant (generally toward the western end of the basin), or have fluctuated from near the ground surface when the basin is full, to as much as 100 feet lower during intermittent dry periods of reduced recharge (generally toward the eastern end of the basin). For illustration of the various groundwater level conditions, the Alluvial wells have been grouped into areas with similar groundwater level patterns as illustrated in Figure III-3 of the 2006 Santa Clarita Valley Water Report. Figures III-4 and III-5 of the 2006 Santa Clarita Valley Water Report present historical groundwater levels organized into hydrograph form (groundwater elevation v. time) for four areas throughout the basin. The other areas shown in Figure III-3 exhibit groundwater level responses that are similar to those illustrated in the four areas.

The "Mint Canyon" area, located at the far eastern end of the groundwater basin, and the nearby "Above Saugus WRP" and "Bouquet Canyon" areas generally exhibit similar groundwater level responses. Those parts of the Alluvium have historically experienced a number of alternating wet and dry hydrologic conditions (2006 Water Report, Figure III-4) during which groundwater level declines have been followed by returns to historic highs. When water levels are low, well yields and pumping capacities in this area can be impacted. The affected purveyors typically respond by increasing use of Saugus Formation and imported SWP supplies, as shown in Table II-8 of the 2006 Santa Clarita Valley Water Report. The purveyors also shift a fraction of the Alluvial pumping that would normally be supplied by "Mint Canyon" area wells to areas further west, where well yields and pumping capacities remain fairly constant because of smaller groundwater level fluctuations. As shown in Figure III-6 of the 2006 Santa Clarita Valley Water Report, the purveyors decreased total Alluvial pumping from the "Mint Canyon" area steadily from 2000 through 2003, and correspondingly increased pumping in the "Below Saugus WRP" and "Below Valencia WRP" areas. In spite of a continued period of below-average precipitation from 1999 to 2003, that progressive decrease in pumping resulted in a cessation of groundwater level decline in the "Mint Canyon" area in 2002 and 2003. Subsequently, wet conditions in late 2004, continuing into 2005, resulted in full recovery of groundwater storage. With such high groundwater levels, pumping in the "Mint Canyon" area was increased in 2005 and further increased in 2006, with no significant change in groundwater levels in 2005 and a slight decrease in 2006.

The "Below Saugus WRP" area (2006 Water Report, Figure III-4), along the Santa Clara River immediately downstream of the Saugus WRP, and the "San Francisquito Canyon" area generally exhibit similar groundwater levels. In this middle part of the basin, historical groundwater levels were lower in the 1950s and 1960s than current levels. Groundwater levels in this area notably recovered as pumping declined through the 1960s and 1970s. They have subsequently sustained generally high levels for much of the last 30 years, with three dry-period exceptions: mid-1970s, late 1980s to early 1990s, and the late 1990s to early 2000s. Recoveries to previous high groundwater levels followed both of the short dry-period declines in the 1970s and 1990s. Most recently, groundwater levels recovered significantly following a wetter-than-average year in 2004 and significantly wet 2005. In 2006, groundwater levels remained largely unchanged in this area.

The "Castaic Valley" area is located along Castaic Creek below Castaic Lake. In that area, groundwater levels have remained fairly constant, with slight responses to climatic and other fluctuations, since the 1950s (2006 Water Report, Figure III-5). Small changes in groundwater levels in 2006 were consistent with other short-term historical fluctuations. The long-term, generally constant trend remained through 2006.

The "Below Valencia WRP" area is located along the Santa Clara River downstream of the Valencia WRP, where discharges of treated effluent from the Valencia WRP to the Santa Clara River contribute to groundwater recharge. Groundwater levels in this area exhibit slight, if any, response to climatic fluctuations, and have remained fairly constant since the 1950s despite, over the last 20 years, a notable increase in pumping that continued through 2006 in that area (2006 Water Report, Figure III-5 and III-6).

In summary, depending on the period of available data, all the history of groundwater levels in the Alluvium shows the same general picture: recent (last 30 years) groundwater levels have exhibited historic highs; in some locations, there are intermittent dry-period declines (resulting from use of some groundwater from storage) followed by wet-period recoveries (and associated refilling of storage space). On a long-term basis, whether over the last 27 years since importation of supplemental SWP water, or over the last 40 to 50 years (since the 1950s - 1960s), the Alluvium shows no signs of water level-related overdraft (i.e., no trend toward decreasing water levels and storage). Consequently, pumping from the Alluvium has been and continues to be sustainable, well within the operational yield of that aquifer on a long-term average basis, and also within the operating yield in almost every individual year.

7. Saugus Formation – General

Saugus wells operated by the purveyors are located in the southern portion of the basin south of the Santa Clara River (2006 Water Report, Figure III-7). Consistent with the 2001 Update Report (Slade) and the 2005 Basin Yield Report (CH2MHill and Luhdorff and Scalmanini Consulting Engineers), the management practice of the purveyors is to utilize the Saugus in accordance with the groundwater operating plan, in the range of 7,500 to 15,000 afy in average/normal years, and planned dry-year pumping of 15,000 to 35,000 afy for one to three consecutive dry years, when shortages to CLWA's SWP water supplies could occur. Such high pumping would be followed by periods of lower pumping (7,500 to 15,000 afy in average/normal years as noted above) in order to allow recharge to recover water levels and storage in the Saugus. Maintaining the substantial volume of water in the Saugus Formation is an important strategy to help maintain water supplies in the Santa Clarita Valley during drought periods.

8. Saugus Formation – Historical and Current Conditions

Total pumping from the Saugus in 2006 was about 7,300 af, or about 750 af more than in the preceding year. Of the total Saugus pumping in 2006, most (nearly 5,900 af) was for municipal water supply, and the balance (1,400 af) was for agricultural and other irrigation uses. Historically, groundwater pumping from the Saugus peaked in the early 1990s and then steadily declined through the remainder of that decade. Since then, Saugus pumping had been in the range of about 4,000 to 6,500 afy, with the increase to about 7,300 af in 2006. On a long-term average basis since the importation of SWP water, total

pumping from the Saugus Formation has ranged between a low of about 3,700 afy (in 1999) and a high of nearly 15,000 afy (in 1991); average pumping from 1980 to present has been about 6,700 afy. These pumping rates remain well within, and generally at the lower end of, the range of operational yield of the Saugus Formation. The overall historic record of Saugus pumping is illustrated in Figure III-8 of the 2006 Santa Clarita Valley Water Report.

Unlike the Alluvium, which has an abundance of wells with extensive water level records, the water level data for the Saugus Formation are limited by both the distribution of the wells in that Formation and the periods of water level record. The wells that do have water level records extending back to the mid-1960s indicate that groundwater levels in the Saugus Formation were highest in the mid-1980s and are currently higher than they were in the mid-1960s (2006 Water Report, Figure III-9). Based on these data, there is no evidence of any historic or recent trend toward permanent water level or storage decline.

Consistent with the 2001 Update Report (Slade), the 2005 Basin Yield Report (CH2MHill and Luhdorff and Scalmanini Consulting Engineers), and the 2005 UWMP, the management practice of the purveyors continues to be to maintain groundwater storage and associated water levels in the Saugus Formation so that supply is available during drought periods, when Alluvial pumping might be reduced and SWP supplies also could be decreased. The period of increased pumping during the early 1990s is a good example of this management strategy. Most notably, in 1991, when SWP deliveries were substantially reduced, increased pumping from the Saugus made up almost half of the decrease in SWP deliveries. The increased Saugus pumping over several consecutive dry years (1991–1994) resulted in short-term declining groundwater levels, reflecting the use of water from storage. However, groundwater levels subsequently recovered when pumping declined, reflecting recovery of groundwater storage in the Saugus Formation.

Letter No. A1

State of California—Business, Transportation and Housing Agency ARNOLD SCHWARZENEGGER, Governor

DEPARTMENT OF CALIFORNIA HIGHWAY PATROL
28648 The Old Road
Valencia, CA 91355
(800)735-2929 (TT/TDD)
(661)294-5540

December 11, 2006

File No.: 540.9107.13086

Mr. Daniel Fierros
Los Angeles Department of Regional Planning
320 West Temple Street
Los Angeles, CA 90012

Dear Mr. Fierros:

This is in response to the Notice of Completion for the Landmark Village Project. The proposed project will be located in the unincorporated area of Los Angeles County and within the jurisdiction of the California Highway Patrol. Traffic enforcement and accident investigation will be the responsibility of our agency. 1

In reviewing this project, State Clearinghouse Number 2004021002, our concern is the effect this project will have on traffic. The project will significantly increase traffic volume on SR-126 and Interstate 5. This will undoubtedly affect the Moorpark and Ventura CHP Area as well as the Newhall CHP Area. Additionally, we have great concern for the additional roadways which would necessitate additional resources and officers to provide traffic enforcement, emergency incident management, public service, assistance and accident investigation. This area has been very rural and sparsely populated and therefore not subjected to the level of patrol responsibilities which we are currently facing in the Santa Clarita Valley metropolitan area. Accordingly, this area will need a substantial increase in resources from the Newhall CHP Area. 2 3 4

If you have any questions or concerns, Sergeant Jacobs will be the contact person for the Newhall CHP Area and may be reached at the above address or telephone number. Thank you for allowing us the opportunity to comment on this project. 5

Sincerely,

S. V. BERNARD, Captain
Commander
Newhall Area

cc: Southern Division
Office of Special Projects

Safety, Service, and Security

A1. Letter from California Highway Patrol, dated December 11, 2006

Response 1

This comment is an introduction to comments that follow. No further response is required.

Response 2

The impacts to traffic volumes are discussed in detail in the Landmark Village Draft EIR, Section 4.7, Traffic/Access, which concludes that all traffic impacts can be mitigated to a less than significant level. Additionally, Section 4.13, Sheriff Services, states that increased service demands can be met through the provision of increased revenues generated by the project as it builds out (via motor vehicle registration and drivers license fees paid by new on-site residents and businesses); the funding for additional staffing and equipment would be made available to the California Highway Patrol (CHP) for allocation by the state CHP to the Santa Clarita Valley to meet future demands, thereby reducing impacts to the CHP to less than significant levels. Although there are no significant impacts to CHP services or facilities, the Draft EIR, nonetheless, responded to CHP's requests for construction signage (see Mitigation Measure LV 4.13-1) and for funding consideration (see Mitigation Measure LV 4.13-4).

Beyond the above response, the comment does not raise any specific issue regarding the adequacy of the Draft EIR's analysis and, therefore, no more specific response can be provided or is required. However, the comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project.

Response 3

The Landmark Village Draft EIR, Section 4.13, Sheriff Services, pp. 4.13-1 through 4.13-15, provides a detailed discussion of existing conditions and possible impacts resulting from implementation of the proposed project. Traffic enforcement, emergency incidents, public services assistance, and accident investigation are evaluated with regard to impacts to CHP operations. The Draft EIR concludes that with mitigation, impacts to CHP services are less than significant.

The project will generate revenues that can be used to provide and/or expand CHP service to the newly developed areas. For further information, please refer to the Landmark Village Draft EIR, Section 4.13, pp. 4.13-14 through 4.13-16, and 4.13-20.

Response 4

Please see **Response 2** above with regard to the need for increased resources to serve the project area.

Response 5

The comment is noted. No further response is required given that the comment does not address or question the content of the Draft EIR.

Letter No. A2

STATE OF CALIFORNIA

Arnold Schwarzenegger, Governor

NATIVE AMERICAN HERITAGE COMMISSION
915 CAPITOL MALL, ROOM 364
SACRAMENTO, CA 95814
(916) 653-6251
Fax (916) 657-5390
Web Site
e-mail: ds_nahc@pacbell.net

December 26, 2006

Mr. Daniel Fierros
LOS ANGELES COUNTY DEPARTMENT OF REGIONAL PLANNING
320 West Temple Street
Los Angeles, CA 90012

Re: SCH#2004021002; CEQA Notice of Completion; draft Environmental Impact Report (DEIR) for **Landmark Village Project; No. 00-196; TR53108/CP00-196/ROAK-OT00-196/RCUO200500112**; LA County Dept of Regional Planning; Mixed Use Development of 1,444 Homes; Hwy 126 Area north of Santa Clarita; Los Angeles County, California

Dear Mr. Fierros:

Thank you for the opportunity to comment on the above-referenced document. The Native American Heritage Commission is the state's Trustee Agency for Native American Cultural Resources. The California Environmental Quality Act (CEQA) requires that any project that causes a substantial adverse change in the significance of an historical resource, that includes archeological resources, is a 'significant effect' requiring the preparation of an Environmental Impact Report (EIR) per CEQA guidelines § 15064.5(b)(c). In order to comply with this provision, the lead agency is required to assess whether the project will have an adverse impact on these resources within the 'area of potential effect (APE)', and if so, to mitigate that effect. To adequately assess the project-related impacts on historical resources, the Commission recommends the following action: 1

√ Contact the appropriate California Historic Resources Information Center (CHRIS). The record search will determine:

- If a part or the entire APE has been previously surveyed for cultural resources.
- If any known cultural resources have already been recorded in or adjacent to the APE.
- If the probability is low, moderate, or high that cultural resources are located in the APE.
- If a survey is required to determine whether previously unrecorded cultural resources are present.

√ If an archaeological inventory survey is required, the final stage is the preparation of a professional report detailing the findings and recommendations of the records search and field survey.

- The final report containing site forms, site significance, and mitigation measures should be submitted immediately to the planning department. All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum, and not be made available for pubic disclosure.
- The final written report should be submitted within 3 months after work has been completed to the appropriate regional archaeological Information Center.

√ Contact the Native American Heritage Commission (NAHC) for: 2

- A Sacred Lands File (SLF) search of the project area and information on tribal contacts in the project vicinity who may have additional cultural resource information. Please provide this office with the following citation format to assist with the Sacred Lands File search request: USGS 7.5-minute quadrangle citation with name, township, range and section: .
- The NAHC advises the use of Native American Monitors to ensure proper identification and care given cultural resources that may be discovered. The NAHC recommends that contact be made with Native American Contacts on the attached list to get their input on potential project impact, particularly the contacts of the on the list.

√ Lack of surface evidence of archeological resources does not preclude their subsurface existence.

- Lead agencies should include in their mitigation plan provisions for the identification and evaluation of accidentally discovered archeological resources, per California Environmental Quality Act (CEQA) §15064.5 (f). In areas of identified archaeological sensitivity, a certified archaeologist and a culturally affiliated Native American, with knowledge in cultural resources, should monitor all ground-disturbing activities.
- Lead agencies should include in their mitigation plan provisions for the disposition of recovered artifacts, in consultation with culturally affiliated Native Americans

√ Lead agencies should include provisions for discovery of Native American human remains or unmarked cemeteries in their mitigation plans. 2

* CEQA Guidelines. Section 15064.5(d) requires the lead agency to work with the Native Americans identified by this Commission if the initial Study identifies the presence or likely presence of Native American human remains within the APE. CEQA Guidelines provide for agreements with Native American, identified by the NAHC, to assure the appropriate and dignified treatment of Native American human remains and any associated grave liens. 3

√ Health and Safety Code §7050.5, Public Resources Code §5097.98 and Sec. §15064.5(d) of the CEQA Guidelines mandate procedures to be followed in the event of an accidental discovery of any human remains in a location other than a dedicated cemetery. 4

√ Lead agencies should consider avoidance, as defined in § 15370 of the CEQA Guidelines, when significant cultural resources are discovered during the course of project planning. 5

Please feel free to contact me at (916) 653-6251 if you have any questions. 6

Sincerely,

Dave Singleton
Program Analyst

Cc: State Clearinghouse

Attachment: List of Native American Contacts

Native American Contacts
Los Angeles County
December 26, 2006

verly Salazar Folkes
31 Shadybrook Drive
ousand Oaks , CA 91362

5 492-7255

Chumash
Tataviam
Fernandeño

Owl Clan
Dr. Kote & Lin A-Lul'Koy Lotah
48825 Sapaque Road
Bradley , CA 93426

(805) 472-9536

Chumash

e Lynn Tumamait
North Pole Ave
i , CA 93023
amait@hotmail.
5) 646-6214

Chumash

Patrick Tumamait
992 El Camino Corto
Ojai , CA 93023
yanahea2@aol.com
(805) 640-0481
(805) 216-1253 Cell

Chumash

City/County Native American Indian Comm
Andrade, Director
5 West 6th Street, Rm. 403
Angeles , CA 90020

5) 351-5324

) 386-3995 FAX

Tehachapi Indian Tribe
Attn: Charlie Cooke
32835 Santiago Road
Acton , CA 93510
suscol@interx.net
(661) 269-1422

Kawaiisu

list is current only as of the date of this document.

ribution of this list does not relieve any person of statutory responsibilitiey as defined in Sec. 7050,5
e Health & Safety Code, Sec. 5097.94 of the Public Resources Code and Sec. 5097.98 of the
i Resources Code.

list is only applicable for contacting local Native Americans with regard to cultural resources for the proposed
l#2004021002; CEQA Notice of Completion; draft Environmental Impact Report (DEIR) for The Landmark
ge Project; Santa Clarita/Hwy 126 Area; Los Angeles County, California.

Native American Contacts
Los Angeles County
December 26, 2006

anemuk & Yowlumne Tejon Indians
lia Dominguez
I N. Virginia
vina , CA 91722

6) 339-6785

Yowlumne

Kitanemuk

San Fernando Band of Mission Indians
John Valenzuela, Chairperson
P.O. Box 221838
Newhall , CA 91322
tsen2u@msn.com
(661) 753-9833 Office
(760) 949-1604 Fax

Fernandeño

Tataviam

Serrano

Vanyume

Kitanemuk

n Valley Indian Council
old Williams, Chairperson
75 Setimo Creek Road
ente , CA 93518

f) 333-5032

Southern Paiute

Kawaiisu

Tubatulabal

Koso

Yokuts

; list is current only as of the date of this document.

ribution of this list does not relieve any person of statutory responsibilitiey as defined in Sec. 7050.5
ie Health & Safety Code, Sec. 5097.94 of the Public Resources Code and Sec. 5097.98 of the
li Resources Code.

list is only applicable for contacting local Native Americans with regard to cultural resources for the proposed
l#2004021002; CEQA Notice of Completion; draft Environmental Impact Report (DEIR) for The Landmark
ge Project; Santa Clarita/Hwy 126 Area; Los Angeles County, California.

A2. Letter from Native American Heritage Commission, dated December 26, 2006

Response 1

This comment is an introduction to comments that follow. No further response is required.

Response 2

The comment states that the project must consult with the Native American Heritage Commission. Section 65352.3 of the Government Code specifically states that:

> "Prior to the adoption or any amendment of a city or county's general plan, proposed on or after March 1, 2005, the city or county shall conduct consultations with California Native American tribes that are on the contact list maintained by the Native American Heritage Commission for the purpose of preserving or mitigating impacts to places, features, and objects described in Sections 5097.9 and 5097.993 of the Public Resources Code that are located within the city or county's jurisdiction...."

The General Plan Amendment for the Landmark Village project was proposed before the March 1, 2005 date reflected in Section 65352.3. Therefore, pursuant to Section 65352.3 of the Government Code, Landmark Village is not required to consult with California Native American tribes. Nonetheless, the project applicant has worked closely with the Fernandeño Tataviam Band of Mission Indians (Tataviam or Tataviam Band) on other projects in the Santa Clarita Valley. The project applicant values their relationship with the Tataviam, has consulted with them on the Landmark Village project, and will continue to consult and work with the Tataviam during build-out of the Newhall Ranch Specific Plan.

In addition, the project applicant has entered into an agreement with the Tataviam Band for the establishment of a cultural enrichment program. In summary, the applicant and the Tataviam Band have agreed to the following program for all of the applicant's properties west of Interstate 5, including the Newhall Ranch Specific Plan, which comprises the Landmark Village project area:

1. Newhall will provide funding to the Tataviam Band for use in the development of cultural enrichment programs associated with the Tataviam Band.
2. Newhall will convey to the Tataviam Band ownership of 1 acre of land located within the proposed Newhall Ranch Homestead Central Neighborhood Park, or an alternative site, for use as a future Native American interpretive/cultural center.
3. Newhall will utilize the Tataviam Band for all monitoring activities associated with grading and development of Newhall projects to be developed west of the Golden State Freeway/Interstate 5, including Newhall Ranch, Entrada, Legacy Village, and the build-out of the Valencia Commerce Center ("Newhall Projects").

4. The Tataviam Band will utilize the funding provided by Newhall for cultural enrichment programs, including cultural research, professional consulting, and grant matching related to efforts by the Tataviam Band to become a federally recognized Native American tribe.
5. The Tataviam Band will utilize the land conveyed by Newhall to construct an interpretive/cultural center to enhance the activities of the Tataviam Band, educate the surrounding non-native community, and allow the Tataviam Band an opportunity to preserve its rich heritage and culture for future generations.
6. In its role as Newhall Projects monitor, the Tataviam Band will supplement the more general knowledge of scientific experts with its special expertise relating to matters of Native American heritage and interest, and act as a liaison between the Native American community, archaeologists, developers, contractors, and public agencies.

Response 3

The comment cites *CEQA Guidelines* Section 15064.5(d) that requires the lead agency to work with Native Americans to determine the likelihood of the presence of human remains within the area of potential effect (APE). A cultural resources report has been prepared for the entire Newhall Ranch Specific Plan, including the Landmark Village project area, which did not indicate the presence or likely presence of human remains on the Specific Plan site. Nonetheless, the Draft EIR includes mitigation measures that address the identification and protection of any additional cultural resources that may be found during project grading and construction (Mitigation Measures LV 4.22-1 and LV 4.22-2). The Draft EIR includes provisions allowing for the identification and protection of any additional cultural resources during project grading and construction.

Response 4

The comment cites mandated procedures to be followed in the event of accidental discovery of human remains. The Draft EIR includes mitigation measures that address the identification and protection of any additional cultural resources that may be found during project grading and construction (Mitigation Measures LV 4.22-1 and LV 4.22-2). If human remains are found, all procedures from the Health and Safety Code §7750.5, Public Resources Code §5097.9E and *CEQA Guidelines* §15064.5(d) will be followed.

Response 5

The comment suggests that lead agencies should consider avoidance when significant cultural resources are discovered. The Draft EIR includes mitigation that addresses the identification and protection of any additional cultural resources that may be found during project grading and construction (Mitigation Measures LV 4.22-1 and LV 4.22-2). Specifically, Mitigation Measure 4.22-1 states that "[I]in the event that resources are found during construction activity should stop and a qualified archaeologist shall be contacted to evaluate the resource. If the find is determined to be a historical or unique archaeological

resources, contingency funding and a time allotment sufficient to allow for implementation of avoidance measures or appropriate mitigation should be available." This measure satisfies the concern of the comment with regard to avoidance of significant resources found during grading.

Response 6

The comment is noted. No further response is required given that the comment does not address or question the content of the Draft EIR.

Letter No. A3

STATE OF CALIFORNIA
Governor's Office of Planning and Research
State Clearinghouse and Planning Unit

Arnold Schwarzenegger
Governor

Cynthia Bryant
Director

January 4, 2007

Daniel Fierros
Los Angeles County Department of Regional Planning
320 West Temple Street
Los Angeles, CA 90012

Subject: The Landmark Village Project, Project No. OO-196, TR 53108/ CP00-196 ROAK-OT00-196/RCUP200500112
SCH#: 2004021002

Dear Daniel Fierros:

The State Clearinghouse submitted the above named Draft EIR to selected state agencies for review. On the enclosed Document Details Report please note that the Clearinghouse has listed the state agencies that reviewed your document. The review period closed on January 3, 2007, and the comments from the responding agency (ies) is (are) enclosed. If this comment package is not in order, please notify the State Clearinghouse immediately. Please refer to the project's ten-digit State Clearinghouse number in future correspondence so that we may respond promptly.

Please note that Section 21104(c) of the California Public Resources Code states that:

> "A responsible or other public agency shall only make substantive comments regarding those activities involved in a project which are within an area of expertise of the agency or which are required to be carried out or approved by the agency. Those comments shall be supported by specific documentation."

These comments are forwarded for use in preparing your final environmental document. Should you need more information or clarification of the enclosed comments, we recommend that you contact the commenting agency directly.

This letter acknowledges that you have complied with the State Clearinghouse review requirements for draft environmental documents, pursuant to the California Environmental Quality Act. Please contact the State Clearinghouse at (916) 445-0613 if you have any questions regarding the environmental review process.

1

Sincerely,

Terry Roberts

Terry Roberts
Director, State Clearinghouse

Enclosures
cc: Resources Agency

1400 TENTH STREET P.O. BOX 3044 SACRAMENTO, CALIFORNIA 95812-3044
TEL (916) 445-0613 FAX (916) 323-3018 www.opr.ca.gov

Document Details Report
State Clearinghouse Data Base

SCH# 2004021002
Project Title The Landmark Village Project, Project No. 00-196, TR 53108/
Lead Agency CP00-196/ROAK-OT00-196/RCUP200500112
Los Angeles County Department of Regional Planning

Type EIR Draft EIR

Description The project consists of 418 lots to include a maximum of 1,444 residential units, a maximum of 1,353,000 square feet of non-residential mixed-use, an elementary school, a community park, three private recreational facilities, open space, and river trail uses. The site is currently used for agricultural purposes and contains miscellaneous, ancillary sheds for agricultural storage and dirt roads. There is southern willow and cottonwood riparian habitat that extends to the central portion of the site along the southern boundary of the tract map. Three oak trees exist on site. Chiquita Canyon Landfill is located to the north of the project site. Several active and abandoned oil wells are located within the tract boundary. The project also includes all on-site and off-site infrastructures necessary to support the proposed project, including a domestic water system, sanitary sewer system, and a drainage network. Some off-site infrastructure improvements will be within SEA 23, Santa Clara River, containing habitat for the endangered stickleback. To protect the development from flood hazards, a bank stabilization system will be installed along portions of Santa Clara River. This project will require 4.2 million cubic yards of removal and recompaction of existing materials, and approximately 1.8 million cubic yards of import from the offsite adobe canyon barrow site. There are two water tanks north of Highway 126 that will service the project site. The EIR analyzes the construction of the Long Canyon Road Bridge across the Santa Clarita River.

Lead Agency Contact

Name Daniel Fierros
Agency Los Angeles County Department of Regional Planning
Phone (213) 974-6461 **Fax**
email
Address 320 West Temple Street
City Los Angeles **State** CA **Zip** 90012

Project Location

County Los Angeles
City Santa Clarita
Region
Cross Streets Chiquita Canyon Road, Commerce Center Drive, and Highway 126
Parcel No. 2826-001-003
Township **Range** **Section** **Base** SB

Proximity to:

Highways 126
Airports
Railways
Waterways Castaic Creek, Santa Clara
Schools
Land Use Agricultural / Specific Plan / Specific Plan

Project Issues Aesthetic/Visual; Agricultural Land; Air Quality; Archaeologic-Historic; Cumulative Effects; Drainage/Absorption; Flood Plain/Flooding; Forest Land/Fire Hazard; Geologic/Seismic; Growth Inducing; Landuse; Minerals; Noise; Other Issues; Population/Housing Balance; Public Services; Recreation/Parks; Schools/Universities; Sewer Capacity; Soil Erosion/Compaction/Grading; Solid Waste; Toxic/Hazardous; Traffic/Circulation; Vegetation; Water Quality; Water Supply; Wetland/Riparian; Wildlife; Economics/Jobs

Note: Blanks in data fields result from insufficient information provided by lead agency.

Document Details Report
State Clearinghouse Data Base

Reviewing Agencies	Resources Agency; Regional Water Quality Control Board, Region 4; Department of Parks and Recreation; Native American Heritage Commission; Integrated Waste Management Board; Office of Historic Preservation; Department of Health Services; Department of Fish and Game, Region 5; Department of Water Resources; Department of Conservation; California Highway Patrol; Caltrans, District 7; Department of Toxic Substances Control

Date Received 11/20/2006 ***Start of Review*** 11/20/2006 ***End of Review*** 01/03/2007

Note: Blanks in data fields result from insufficient information provided by lead agency.

A3. Letter from Governor's Office of Planning and Research, dated January 4, 2007

Response 1

The comment provides factual background information only and does not raise an environmental issue within the meaning of CEQA. The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not raise an environmental issue regarding the content of the Draft EIR, no further response is required.

Letter No. A4

Fierros, Daniel

From: Scott P. Harris [spharris@dfg.ca.gov]
Sent: Monday, January 08, 2007 8:45 AM
To: Fierros, Daniel
Subject: Landmark Village DEIR Review

Daniel,

The Department of Fish and Game is requesting a 30 day extension from the closing date of public comments on the Landmark Village DEIR for lead agency consideration of Department comments. Staff availability and volume of review materials is making it problematic for the Department's timely review. Thank you for your consideration. 1

Scott Harris
Associate Wildlife Biologist
Department of Fish and Game
626/797-3170

1

A4. Letter from State of California Department of Fish and Game, dated January 8, 2007

Response 1

The comment requests a 30-day extension of time for commenting on the Draft EIR. The additional time was provided. For additional information responsive to the comment, please refer to **Topical Response 3**: Public Review Opportunities. The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not raise an environmental issue, no further response is required.

STATE OF CALIFORNIA — Arnold Schwarzenegger, Governor

NATIVE AMERICAN HERITAGE COMMISSION
915 CAPITOL MALL, ROOM 364
SACRAMENTO, CA 95814
(916) 653-6251
Fax (916) 657-5390
Web Site www.nahc.ca.gov
e-mail: ds_nahc@pacbell.net

January 22, 2007

Mr. Daniel Fierros
LOS ANGELES COUNTY DEPARTMENT OF REGIONAL PLANNING
320 West Temple Street
Los Angeles, CA 90012

Sent by FAX to: (213) ~~617-2202~~ 626-0434
No. of Pages: 1

Re: SCH#2004021002; CEQA Notice of Completion; draft Environmental Impact Report (DEIR) for **Landmark Village Project; No. 00-196; TR53108/CP00-196/ROAK-OT00-196/RCUO200500112**; LA County Dept of Regional Planning; Mixed Use Development of 1,444 Homes; Hwy 126 Area north of Santa Clarita; Los Angeles County, California

Dear Mr. Fierros:

This is an **ADDENDUM TO OUR LETTER OF DECEMBER 26, 2006**. We have completed a review of the Technical Appendices 4.2A and we note in Section 2.2 in the Ethnographic Description (page 7 of 120 pages) that the archaeological firm contracted to the County of Los Angeles, states that the "**Tataviam Tribe is extinct.**" This statement is unacceptable to the Native American Heritage Commission (NAHC). The Commission is in frequent contact with the Tatviam Tribe; its chairperson, Rudy J. Ortega, Sr., recently played an important role in getting AB 2641, which deals with issues of Native American human remains, passed in the 2006 Session of the California Legislature. The Fernandeño Tataviam Band of Mission Indians is a organized California Native American tribe and on the NAHC Tribal Consultation list pursuant to Government Code Section 65352.3. 1

If you have any questions concerning this ADDENDUM to our letter of December 26, 2006, please do not hesitate to contact me at (916) 653-6251. 2

Sincerely,

Dave Singleton
Program Analyst

Cc: Larry Myers, Executive Secretary – Native American Heritage Commission

A5. Letter from Native American Heritage Commission, dated January 22, 2007

Response 1

The comment highlights a statement made in the technical report prepared for the Newhall Ranch Specific Plan, which states that the "Tatavium Tribe is extinct." The comment correctly states that the statement is inaccurate. To rectify this inaccuracy, several steps have been undertaken. The preparer of the cultural report, W&S Consultants, has personally apologized to the Tataviam Band via a letter, dated February 15, 2007, for making the inaccurate statement.[1] Additionally, W&S has amended the Landmark Village Cultural Resources Report to remove this language and replaced it with language that reflects the existence of the Tataviam as documented by the Ethnographic Overview of the Angeles National Forest, Tataviam and San Gabriel Mountain Serrano Ethnohistory (2004).

For further information responsive to this comment, please refer to **Response 2** to letter from Native American Heritage Commission, dated December 26, 2006.

Response 2

The comment is noted. No further response is required given that the comment does not address or question the content of the Draft EIR.

1 The letter from W&S Consultants, dated February 15, 2007, is found in **Appendix E** of this Final EIR.

Letter No. A6

California Regional Water Quality Control Board
Los Angeles Region

320 W. 4th Street, Suite 200, Los Angeles, California 90012
Phone (213) 576-6600 FAX (213) 576-6640 - Internet Address: http://www.waterboards.ca.gov/losangeles

Linda S. Adams
Cal/EPA Secretary

Arnold Schwarzenegger
Governor

Post-it™ brand fax transmittal memo 7671	# of pages ▸ 3
To Daniel Fierros	From Sam Unger
Co. LAC DRP	Co. LARWQCB
Dept.	Phone # 213-576-6622
Fax # 626-0434	Fax #

January 22, 2007

Mr. Daniel Fierros
County of Los Angeles
Department of Regional Planning
Impact Analysis Section, Room 1348
320 West Temple Street
Los Angeles, CA, 90012

COMMENTS ON DRAFT ENVIRONMENTAL IMPACT REPORT FOR THE LANDMARK VILLAGE PROJECT, COUNTY PROJECT NO. 00-196, SCH NO. 2004021002

Dear Mr. Fierros:

Thank you for the opportunity to comment on the Draft Environmental Impact Report (DEIR) for the Landmark Village project.

The Landmark Village project site is located in unincorporated Los Angeles County, within the Santa Clarita Valley, and within the Santa Clara River watershed. The Landmark Village project site lies within the jurisdiction of the Los Angeles Regional Water Quality Control Board (Regional Board). The Regional Board is charged with protecting the surface and groundwater quality in the Santa Clara River watershed. Please address the following comments on the water quality section (Chapter 4.3) of the DEIR: 1

- The DEIR discusses the environmental impacts of urban runoff from the Landmark Village project site; however the impacts of wastewater (from the quality and quantity perspective), generated by residential and commercial uses, were not addressed. Reach 5 of the Santa Clara River is listed on the 2002 Clean Water Act (CWA) Section 303(d) List for chloride, coliform, and nitrate-nitrogen plus nitrite-nitrogen, and is on the proposed 2006 CWA Section 303(d) List for chloride and coliform. Wastewater discharges from the Los Angeles County Sanitation Districts' Saugus and Valencia Water Reclamation Plants have been identified as the primary source of chloride in the Santa Clara River by the Upper Santa Clara River (USCR) Chloride TMDL. Similarly, wastewater generated from the Landmark Village project site may have a potentially significant impact on the Santa Clara River if the treated wastewater is discharged to the USCR. Regional Board staff believes that the impacts of wastewater discharges, generated by the Landmark Village project, to the upper Santa Clara 2

California Environmental Protection Agency

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River should be addressed by the DEIR. If the impacts of wastewater have been discussed in other documents, the DEIR should reference those documents. 2

- The DEIR should include a detailed impact analysis of urban pesticides. The DEIR presents very limited pesticide monitoring data. The current Landmark Village project site is largely open space with limited agricultural use and thereby limited pesticide applications. Urban pesticide applications that would be expected as part of the proposed project are likely to have greater pesticide applications at the site than current practice. Detailed information on pesticides monitoring and impact analysis is necessary to quantity the impacts of pesticides application. 3

- The potential impacts of actively used urban pesticides is not sufficiently discussed in the DEIR. The DEIR discusses mainly on chloropyrifos and diazinon. Chlorpyrifos and diazinon have been banned by the USEPA for most urban applications, although some public health uses such as fire ant eradicaiton and mosquito control have been continued; however, other active pesticides that are allowed for urban applications may have potentially significant impacts. In addition to discussing the impacts from the allowable uses of chlorpyrifos and diazinon, please discuss impacts from other pesticides that may be utilized in these areas. 4

- The DEIR should more adequately discuss the incremental steps needed to significantly reduce the project's stormwater runoff and accomplish the hydrologic goals (i.e., site drainage) of the project. As presented, the annual volume of stormwater runoff from the site will increase from 183 acre-feet per year to 331 acre-feet per year; this is an 81 percent increase in annual stormwater runoff. Increased stormwater runoff not only contributes more pollutants, but can cause significant hydromodification downstream which can cause further water quality impacts and habitat loss. Reduction of stormwater runoff may primarily be achieved through best management practices (BMPs) such as an increase in open spaces, and an increase in drainage flow pathway within the project area. 5

- The DEIR should describe the process of how the required principles of development will achieve the hydrologic goals through use of special exceptions, zoning or subdivision ordinances. Essentially, most development projects currently planned do not incorporate Low Impact Development (LID) strategies on site planning because these LID techniques require special exceptions and/or ordinances. Primarily, the LID approach is a site drainage approach designed to mimic the natural drainage prior to development. 6

- The DEIR should describe the procedures the developer will follow to achieve special exceptions (or code modifications) for zoning and subdivision ordinances to better protect the area's water resources. Model development techniques include: shorter or narrower streets, fewer and smaller cul-de-sacs, smaller parking lots, permeable pavement, increased storm 7

water BMPs, more community open spaces, flexible sidewalk standards, increased vegetated buffers and other similar measures. 7

- The DEIR should discuss in the development site-preparation plan and/or negative impact declaration, the 750-acre off-site grading area. In unusual circumstances or complex excavation and grading operations, the off-site grading may impact (extent of the pre- and post-grading operations) water quality and quantity of the project area due to clearing and grubbing, construction of access roads, by-passes, and controls and protection of existing natural drainages and slope stabilization. 8

- The DEIR should discuss cumulative impacts from hydromodification of the Landmark Village project in relationship to other projects in the Santa Clara River watershed. The total miles of hydromodification from all the projects of the Specific Plan need to be assessed. Each hydromodication shall be subject to 401 certification requirements. 9

If you have any questions, please contact Regional Board staff Dr. Yanjie Chu at (213) 576-6681 or Carlos D. Santos at (213) 620-2093. 10

Sincerely,

Samuel Unger for

Deborah J. Smith
Chief Deputy Executive Officer

California Environmental Protection Agency

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TOTAL P.03

A6. Letter from California Regional Water Quality Control Board – Los Angeles Region, dated January 22, 2007

Introduction

Since the California Regional Water Quality Control Board, Los Angeles Region (LARWQCB) submitted its comment letter on the Landmark Village Draft EIR, the LARWQCB adopted waste discharge requirements and a National Pollutant Discharge Elimination System (NPDES) Permit, related to the discharge of treated wastewater from the Newhall Ranch Water Reclamation Plant (WRP), which is located within the boundary of the approved Newhall Ranch Specific Plan. The balance of this response summarizes the recent permitting and associated requirements.

On September 6, 2007, the LARWQCB adopted Order No. R4-2007-0046 relative to the Newhall Ranch Water Sanitation District's WRP waste discharge, which order also serves as the NPDES Permit for the WRP (NPDES Permit No. CA0064556). The Order is effective on October 27, 2007. The Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and the implementing regulations adopted by the U.S. Environmental Protection Agency (U.S. EPA), and Chapter 5.5, Division 7 of the California Water Code. The Order also serves as Waste Discharge Requirements (WDRs) pursuant to Article 4, Chapter 4, Division 7 of the California Water Code. Pursuant to the CWA and the NPDES regulations, no point source may discharge pollutants into waters of the United States without explicit authorization provided by a NPDES permit. The Order includes or implements the requirements discussed below.

Background. By way of background, The Newhall Land and Farming Company (Newhall Land) submitted a Report of Waste Discharge, dated April 23, 2004, and applied for a NPDES permit authorization to discharge up to 2 million gallons per day (MGD) of tertiary treated wastewater from the Newhall Ranch WRP that would treat the sewage generated by the inhabitants of the initial phases of Newhall Ranch, including Landmark Village. Thereafter, on July 27, 2006, the Newhall Ranch Sanitation District was formed. Construction of the Newhall Ranch WRP is scheduled to begin in September 2008, and is anticipated to be completed by August 2009. The Newhall Ranch WRP would have an initial capacity of 2 MGD, and would incrementally increase its design capacity to 6.8 MGD to accommodate the sewage generated by new inhabitants as Newhall Ranch builds out. Treatment at the Newhall Ranch WRP, a publicly owned treatment works (POTW) will consist of screening, activated sludge secondary treatment with membrane bioreactors, nitrification/denitrification, ultraviolet disinfection, and partial reverse osmosis (RO). There will be no solids handling facilities in the near term; waste activated sludge, or biosolids, will be hauled to the Valencia WRP for further treatment and disposal, which will be regulated under the Valencia WRP's NPDES Permit No. CA0054216. Brine from the RO system will be

disposed of through deep well injection, under a separate permit from the U.S. EPA. Treated wastewater will be discharged to the Santa Clara River.

Technology-Based Effluent Limitations. The Order includes applicable technology-based effluent limitations, required pursuant to 40 Code of Federal Regulations (CFR) section 122.44(a), based on tertiary treatment or equivalent requirements that meet both the technology-based secondary treatment standards (40 C.F.R. pt. 133) for POTWs and protect the beneficial uses of the receiving waters. Attachment F to the Order includes a detailed discussion of the technology-based effluent limitations for the Newhall Ranch WRP.

Water Quality-Based Effluent Limitations. Pursuant to section 301(b) of the CWA and 40 C.F.R. section 122.44(d), NPDES permits must include limitations more stringent than applicable federal technology-based requirements where necessary to achieve applicable water quality standards. Permits must include effluent limitations for all pollutants that are or may be discharged at levels that have the reasonable potential to cause or contribute to an exceedance of a water quality standard, including numeric and narrative objectives within a standard. Where a reasonable potential has been established for a pollutant, but there is no numeric criterion or objective for the pollutant, water quality-based effluent limitations must be established, as provided in 40 C.F.R. section 122.44(d)(1)(vi). Attachment F to the Order includes a detailed discussion of the water quality-based effluent limitations for the Newhall Ranch WRP.

Water Quality Control Plans. Requirements of the Order implement the Basin Plan for the Coastal Watershed of Los Angeles and Ventura Counties (Basin Plan), which is the Water Quality Control Plan for the Los Angeles Region adopted by the LARWQCB. The Basin Plan is required pursuant to California state law (Porter-Cologne Water Quality Control Act, Wat. Code §13000 *et seq*.) and designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all water addressed in the Plan.

Section 303(d) of the CWA requires that states identify waters that do not, or are not expected to, meet water quality standards with the implementation of technology-based controls. Once a waterbody has been placed on the Section 303(d) List, states are required to develop a Total Maximum Daily Loads (TMDL) to address each pollutant causing impairment. A TMDL defines the amount of a pollutant that a waterbody can tolerate and still meet water quality standards. TMDLs, and their associated implementation plans, are incorporated into the Basin Plans.

In 2003, the U.S. EPA approved the state's 2002 Section 303(d) List. The Santa Clara River, Santa Clara River Estuary, and their tributaries were on the 2002 Section 303(d) List. In 2006, the State Water Resources Control Board (SWRCB) adopted a revised Section 303(d) List, which was partially approved

by the U.S. EPA. However, on March 8, 2007, the U.S. EPA partially disapproved the 2006 Section 303(d) List. The Santa Clara River, Santa Clara River Estuary, and their tributaries are included in the 2006 Section 303(d) List.

Monitoring and Reporting. The Monitoring and Reporting Program, included as Attachment E to the Order, specifies the monitoring and reporting requirements necessary to implement federal and state requirements for NPDES permits (40 C.F.R. §122.48; Wat. Code §§13267 and 13383).

Specifically, the Monitoring and Reporting Program identifies general monitoring provisions, describes monitoring locations, and provides influent monitoring requirements, effluent monitoring requirements, whole effluent toxicity testing requirements, land discharge monitoring requirements, reclamation monitoring requirements, surface water and groundwater receiving water monitoring requirements, and other monitoring requirements. The Monitoring and Reporting Program also identifies the applicable reporting requirements, including general monitoring and reporting requirements, self-monitoring reports, discharge monitoring reports, and other reports.

Standard and Special Provisions. Standard provisions apply to all NPDES permits in accordance with 40 C.F.R. section 122.41. Additional conditions are also applicable to specified categories of permits in accordance with 40 C.F.R. section 122.42. The standard and special provisions are provided in Attachment D of the Order.

Specifically, the Order includes standard provisions for permit compliance, permit action, monitoring, records, reporting, and enforcement. In addition, the Order includes special provisions regarding notification levels of POTWs, such as the Newhall Ranch WRP, which requires that all POTWs provide adequate notice to the RWQCB, pursuant to 40 C.F.R. section 122.42(b), of any new introduction of pollutant into the POTW from an indirect discharger that would be subject to section 301 or 306 of the CWA if it were directly discharging those pollutants, and any substantial change in the volume or character of pollutants being introduced into that POTW by a source introducing pollutants into the POTW at the time of adoption of the Order, and requires that the notice include information on the quality and quantity of effluent introduced into the POTW and the anticipated impact of the change on the quality or quantity of effluent to be discharged from the POTW.

Response 1

The comment restates information contained in the Draft EIR, but does not raise an environmental issue within the meaning of CEQA. The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not raise an environmental issue regarding the content of the Draft EIR, no further response is required.

Response 2

Wastewater generated by the Landmark Village project will ultimately be treated in the Newhall Ranch Water Reclamation Plant (WRP). Initially flows from Landmark Village may be pumped back and treated at the Valencia WRP until the Newhall Ranch WRP is operational. The Newhall Ranch WRP was analyzed at the project-level in the certified Newhall Ranch Specific Plan Program EIR (May 2003).

As stated above, the Newhall Ranch WRP treatment facility is further described in the individual National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements (WDRs) for the Newhall Ranch WRP adopted by the LARWQCB on September 6, 2007 (LARWQCB, 2007).[2] Treatment at the WRP will consist of screening, activated sludge secondary treatment with membrane bioreactors, nitrification/denitrification, ultraviolet disinfection, and partial reverse osmosis. The initial design capacity of the WRP will be 2 million gallons per day (MGD) to accommodate the initial phases of the Newhall Ranch Specific Plan, including Landmark Village, and will be incrementally increased to 6.8 MGD to accommodate the sewage generated by the build-out of Newhall Ranch, of which Landmark Village is a part.

Treated effluent from the Newhall Ranch WRP will be used to supply distribution of recycled water throughout the Newhall Ranch Specific Plan area in the form of irrigation of landscaping and other approved uses. In an average rainfall year, all tertiary treated wastewater from the Newhall Ranch WRP would be reclaimed for irrigation and other non-potable uses, except in the wet weather months. During these months in average rainfall years, approximately 286 to 1,025 acre-feet of tertiary-treated wastewater would not be needed to meet estimated non-potable demand and, therefore, would be discharged to the Santa Clara River (Impact Sciences, 2003).[3] During years 1 and 2 of the Newhall Ranch WRP operation, the WRP will operate at a maximum of 2 MGD, with an estimated average discharge flow rate of 0.2 MGD during the five month period of November through March (LARWQCB, 2007). No sooner than year 3, the WRP would be expanded to 6.8 MGD, with an approximate average discharge flowrate of 0.6 MGD during this 5 month wet period (LARWQCB, 2007). Therefore, discharge periods will coincide with peak wet months when dilution capacity is maximal (i.e., instream flows are highest). The average November-March instream flowrate at USGS station 11109000 (Newhall Bridge, approximately 2.5 miles

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2 Los Angeles Regional Water Quality Control Board (LARWQCB), 2007. Draft Order No. R4-2007-XXX, NPDES Permit No. CA0064556, Waste Discharge Requirements for the Newhall Ranch Sanitation District (Newhall Ranch Water Reclamation Plan) Discharge to the Santa Clara River. August 6, 2007. This report is incorporated by this reference and available for public review and inspection at Impact Sciences, Inc., 803 Camarillo Springs Road, Suite A-1, Camarillo, California 93012.

3 The Revised Additional Analysis to the Newhall Ranch Specific Plan and Water Reclamation Plan Final Environmental Impact Report (Project #94-087-(5), SCH No. 1995011015), prepared by Impact Sciences for the Los Angeles County Department of Regional Planning (May 2003) is incorporated by this reference and available for public review and inspection at Impact Sciences, Inc., 803 Camarillo Springs Road, Suite A-1, Camarillo, California 93012.

downstream of the County line), is 188 cfs (121 mgd) based on measured average daily flow data for water years 1977-2006 (LARWQCB, 2007). Newhall WRP effluent will represent less than 1 percent of this average volume.

The NPDES Permit contains effluent limitations that will control the amount of conventional, non-conventional, and toxic pollutants discharged to the receiving waters. These effluent limits are a combination of technology-based limits (per 40 CFR section 122.44(a)) and water quality-based limits (per 40 CFR section 122.44(d)). Concentration-based effluent limitations contained in the NPDES Permit are listed in **Table A-1, Effluent Limitations in the Newhall Ranch WRP NPDES Permit**. Mass-based effluent limitations (lbs/day) contained in the permit, but not listed in **Table A-1**, are derived by multiplying the proposed concentration limitation by the permitted flow of 2.0 mgd and by a conversion factor of 8.34. These mass-based limits will be modified accordingly as the phased plant upgrades approach completion following an anti-degradation analysis demonstration conducted by Newhall Land, and upon certification and approval of increased treatment plant capacity.

Additional water quality-based effluent limits are included in the permit for toxicity in the WRP effluent and for temperature, pH, dissolved oxygen, fecal coliform, turbidity, toxicity, and other pollutants in the receiving water. Groundwater-based effluent limitations are proposed for coliform bacteria, chemical constituents, radionuclides, nitrate-N + nitrite-N, and taste or odor producing substances.

Title 22 of the California Code of Regulations (Title 22) specifies California's Wastewater Reclamation Criteria (WRC) and all reclaimed water in California must meet or exceed these criteria to assure protection of receiving water quality. These criteria apply to the treatment processes; treatment performance standards, such as removal efficiencies and effluent water quality; process monitoring programs, including type and frequency of monitoring; facility operation plans; and necessary reliability features. The Newhall Ranch WRP discharges will be required to comply with the WRC through the issuance of a separate order.

As discussed in the Newhall Ranch WRP NPDES Permit, Attachment F, Fact Sheet (p. F-13), the Upper Santa Clara River chloride wasteload allocations (WLAs) are expressed on a concentration basis derived from and equivalent to the existing water quality objective for Reaches 5 and 6 of the Santa Clara River, thereby providing direct protection for agricultural supply, the most sensitive beneficial use. Under the TMDL Implementation Plan, a special study was conducted to confirm that the concentration-based WLA of 100 mg/L chloride is protective of this beneficial use. A concentration-based WLA also accommodates future growth and provides beneficial uses protection from chloride loads that were in place at the time of the TMDL development. Protection of beneficial uses from additional chloride loads that were not assigned wasteload allocations is provided by using the WLAs as effluent limits in permits for new and future sources, such as the Newhall Ranch WRP.

Table A-1
Effluent Limitations in the Newhall Ranch WRP NPDES Permit

Parameter	Units	Effluent Limitations		
		Average Monthly	Average Weekly	Maximum Daily
Biochemical Oxygen Demand 5-day @ 20°C	mg/L	20	30	45
Total Suspended Solids	mg/L	15	40	45
pH	standard units	6.5 – 8.5 (instantaneous minimum and maximum)		
Settleable solids	mg/L	0.1	--	0.3
Oil and Grease	mg/L	10	--	15
Total dissolved solids	mg/L	1,000	--	--
Chloride	mg/L	100 [1]	--	--
Sulfate	mg/L	400	--	--
Boron	mg/L	1.5	--	--
Total ammonia (NH_3 as N)	mg/L	1.93 [2]	--	3.87 [3]
Nitrate-N + Nitrite-N	mg/L	5	--	--
Nitrite-N	mg/L	0.9	--	--
Detergents (as MBAS)	mg/L	0.5	--	--
Total residual chlorine	mg/L	--	--	0.1
Antimony	µg/L	6	--	--
Arsenic	µg/L	10	--	--
Copper	µg/L	22	--	44
Lead	µg/L	13	--	26
Mercury	µg/L	0.051	--	0.10
Nickel	µg/L	100	--	--
Selenium	µg/L	4.1	--	8.2
Zinc	µg/L	5,000	--	--
Cyanide	µg/L	4.2	--	8.5
Acrylonitrile	µg/L	0.66		1.3
Tetrachloroethylene	µg/L	5	--	--
Bis(2-ethylhexyl)phthalate	µg/L	4	--	--
p-Dischlorobenzene (1,4-Dichlorobenzene)	µg/L	5	--	--
Lindane	µg/L	0.2	--	--
4,4-DDE	µg/L	0.00059	--	--
Iron	µg/L	300	--	--

[1] *This is the water quality objective for chloride in the current Basin Plan. This effluent limitation is consistent with the assumptions of applies immediately and will stay in effect until the Chloride TMDL for the Santa Clara River, Resolution No. 2002-018, Amendment to the Water Quality Control Plan for the Los Angeles Region to Include a TMDL for Chloride in the Santa Clara River (Chloride TMDL), is revised to include a waste load allocation to Newhall Ranch WRP. This effluent limitation applies immediately. However, if a chloride site-specific objective (Chloride SSO) is adopted for the reach of the Santa Clara River in which Newhall Ranch WRP will discharge, then the permit may be reopened to make the necessary changes to this permit, following USEPA approval of the Chloride SSO.*

[2] *This is the monthly average effluent limit calculated according to the Implementation Plan for ammonia in the Basin Plan, which specifies how to translate the Ammonia WQO into a final effluent limit, consistent with the assumptions of the Santa Clara River Nitrogen Compounds TMDL, Resolution No. 03-011.*

[3] *This is the daily maximum effluent limit calculated according to the Implementation Plan for ammonia in the Basin Plan, which specifies how to translate the Ammonia WQO into a final effluent limit, consistent with the assumptions of the Santa Clara River Nitrogen Compounds TMDL, Resolution No. 03-011.*

As discussed in the Newhall Ranch WRP NPDES Permit, Attachment F, Fact Sheet (p. F-13), the Upper Santa Clara River chloride wasteload allocations (WLAs) are expressed on a concentration basis derived from and equivalent to the existing water quality objective for Reaches 5 and 6 of the Santa Clara River, thereby providing direct protection for agricultural supply, the most sensitive beneficial use. Under the TMDL Implementation Plan, a special study was conducted to confirm that the concentration-based WLA of 100 mg/L chloride is protective of this beneficial use. A concentration-based WLA also accommodates future growth and provides beneficial uses protection from chloride loads that were in place at the time of the TMDL development. Protection of beneficial uses from additional chloride loads that were not assigned wasteload allocations is provided by using the WLAs as effluent limits in permits for new and future sources, such as the Newhall Ranch WRP.

Further stated in the Fact Sheet (p. F-13), the Staff Report for the TMDL, dated August 21, 2002, states: "[a] concentration-based target accommodates future growth by allowing increased mass as long as it is accompanied by additional flow… " The Fact Sheet finds that water quality will not be degraded if concentration-based wasteload allocations that are equivalent to the water quality objectives are assigned to new facilities at the end of pipe. The Fact Sheet also states that studies regarding the effect of additional chloride load on groundwater basins underlying the Upper Santa Clara River are underway and scheduled for completion by November 2007 (Fact Sheet p. F-14). Initial results from these studies show that discharges at effluent limits of 100 mg/L chloride will not degrade groundwater quality. Results from these studies may be used to revise the effluent limits through modification of the NPDES permits for all dischargers discharging at 100 mg/L if necessary.

Similarly, concentration-based effluent limitations contained in the NPDES Permit for nitrogen compounds, established per the *Santa Clara River Nitrogen Compounds TMDL*, are protective of water quality in the Santa Clara River.

Water quality-based effluent limitations are included in the NPDES Permit for pathogen indicator bacteria as follows:

- E.coli density shall not exceed 126/100 mL (geometric mean) or 235/100 mL (single sample);
- Fecal coliform density shall not exceed 200/100mL (geometric mean) or 400/100 mL (single sample).

These receiving water limitations are based on Resolution No. 01-018, Amendment to the Water Quality Control Plan for the Los Angeles Region to Update the Bacteria Objectives for Water Bodies Designated for Water Contact Recreation, and, therefore, are protective of beneficial uses in the Santa Clara River.

Based on required compliance with state and federal water quality requirements, as discussed in the **Introduction** above, and in the project-level analysis contained in the Newhall Ranch Specific Plan Program EIR, and the information presented in this response above, there will be no significant impacts to water quality or quantity in the Santa Clara River related to wastewater discharges from the Newhall Ranch WRP.

Response 3

The Draft EIR Section 4.3, Water Quality, and Appendix 4.3 (Landmark Village Water Quality Technical Report; WQTR), Section 7.2.2 contains a detailed qualitative impact analysis of urban pesticides. Pesticides were analyzed qualitatively because monitoring data is not readily available for pesticides in urban runoff. Typically, pesticides concentrations in urban runoff are not detected or are present at levels below detection limits for most commercial laboratories and, therefore, there are limited statistically reliable data available for modeling.

Los Angeles County monitored ten common pesticides in stormwater runoff from eight land use characterization stations (**Table A-2**) and the majority of laboratory results for the combinations of land uses and pesticides did not detect any concentrations above laboratory detection levels for all of the samples collected (LACDPW, 2000).[4] Of the 80 combinations of individual pesticides and land uses within the Los Angeles data set, only 7 of these combinations had any measurable concentrations of pesticides. The only detected pesticides were diazinon and glyphosate which, as shown in **Table A-2**, were detected in only 3 to 4 percent of the samples. These data indicate that diazinon and glyphosate (Roundup) were the most frequently detected pesticides in urban runoff, but the percent of samples above detection are generally less than 10 percent. It is also important to note that Diazinon use has been phased out since the Los Angeles County data were collected and thus is expected to occur less frequently than indicated by the Los Angeles County data.

As discussed in the Draft EIR and WQTR, the proposed Landmark Village tract map site is currently cultivated with row crops. Miscellaneous ancillary sheds used to store agricultural equipment are also found on the site. Several dirt roads provide access to the cultivated fields. Abandoned oil wells along with water wells are also dispersed within the project boundary. Land within the Adobe Canyon borrow site, Chiquito Canyon grading site, and along the utility corridor is generally disturbed by agricultural cultivation, cattle grazing, oil production. Other portions of the project site contain native vegetation.

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[4] Los Angeles County Department of Public Works (LACDPW), 2000. Los Angeles County 1994-2000 Integrated Receiving Water Impacts Report. Prepared by Los Angeles County Department of Public Works. This report is incorporated by this reference and available for public review and inspection at Impact Sciences, Inc., 803 Camarillo Springs Road, Suite A-1, Camarillo, California 93012.

Table A-2
LADPW Pesticide Sampling Summary

Pesticide/Group	# Samples	# Detects	Detection Limit (µg/l)
Organochlorine Pesticides & PCBs	242	0	0.05–1.0
Carbofuran	333	0	5
Glyphosate	154	5	25
Diazinon	302	12	0.01
Chlorpyrifos	302	0	0.05
Thiobencarb	302	0	1
Other N- and P Containing Pesticides	315	0	1.0–2.0
2,4-D	234	0	10
2,4,5-TP	234	0	1
Bentazon	234	0	2

Because much of the land that will be developed as part of the project is currently cultivated row crops, the project's urban pesticide use is likely to result in less pesticide application than current cultivated agriculture uses. In addition, construction and post-development source control measures, including a pesticide education program for owners, occupants, and employees on the proper application, storage, and disposal of pesticides will be employed to further reduce the likelihood of improper pesticide use. Integrated Pest Management of common area landscaping in commercial areas, multi-family residential areas, and parks, will be implemented as Project Design Features of the Landmark Village project, which also will control pesticide loads and concentrations.

Based on the incorporation of source control measures, potential impacts associated with pesticides will be less than significant. For further information supportive of this finding, please see **Response 4**, below.

Response 4

See **Response 3**, above, for a discussion of urban pesticides. The Los Angeles County data discussed above includes urban pesticides other than chlorpyrifos and diazinon, and a number of other frequently used urban pesticides were analyzed qualitatively and in detail in the Landmark Village Draft EIR in Section 4.3, Water Quality, and Appendix 4.3, Section 7.2.2.

With respect to diazinon, it had long been one of the most commonly used pesticides on the market (SFBRWQCB, 2005) before its use was phased out, beginning in 2000. Although the U.S. Environmental Protection Agency's actions eliminated most urban diazinon uses by the end of 2004, phasing out

diazinon likely has increased post-2004 reliance on alternative pesticides and encouraged new pesticides to enter the marketplace.

The San Francisco Regional Water Quality Control Board commissioned a study, *Insecticide Market Trends and Potential Water Quality Implications*,[5] to evaluate pesticide use trends as they relate to water quality. In 2003, on the basis of current and projected pesticide use and possible water quality risks, the report considered the pesticide alternatives of potential concern for water quality to be pyrethrums; parathyroid's (bifenthrin, cyfluthrin, cypermethrin, deltamethrin, esfenvalerate, and permethrin); carbaryl; malathion; and imidacloprid (SFBRWQCB, 2003). A more recent study also identified lambda cyhalothrin (a pyrethroid) and fipronil among pesticides of interest (SFEP, 2005).

The water quality risks posed by a pesticide relate to the quantity of the pesticide used, its runoff characteristics, and its relative toxicity in water and sediment. As urban diazinon applications are phased out, the use of some alternatives may inadvertently pose new water quality risks. Given what is known about alternative pesticide use trends, pyrethroids may be the alternatives that pose the greatest concerns for water quality (SFBRWQCB, 2005). Although pyrethroids tend to be toxic to *Ceriodaphnia dubia* test organisms at concentrations in water comparable to diazinon, pyrethroids do not dissolve well in water but instead adhere well to surfaces, including particles in the environment (SFBRWQCB, 2005). At equilibrium, pyrethroid concentrations in sediment are reported to be about 3,000 times greater than dissolved concentrations in water (SFBRWQCB, 2005). Thus, BMPs targeting reductions and removal of sediment loads will be effective to reduce and remove pyrethroids as well.

During the construction phase, an effective combination of sediment and erosion control BMPs must be implemented at all times. These BMPs will consist of some combination of the following measures:

1. Erosion Control (BMPs numbered EC-3 through EC-7 and WE-1 in the Stormwater Best Management Practice Handbook - Construction (CASQA 2003))
   - Physical stabilization through hydraulic mulch, soil binders, straw mulch, bonded fiber matrices, and erosion control blankets (i.e., rolled erosion control products).
   - Limiting the area and duration of exposure of disturbed soils.
   - Soil roughening of graded areas (through track walking, scarifying, sheepsfoot rolling, or imprinting) to slow runoff, enhance infiltration, and reduce erosion.
   - Vegetation stabilization through temporary seeding to establish interim vegetation.
   - Wind erosion (dust) control through the application of water or other dust palliatives as necessary to prevent and alleviate dust nuisance.

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5 San Francisco Bay Regional Water Quality Control Board (SFBRWQCB), 2003. Insecticide Market Trends and Potential Water Quality Implications, prepared by K. Moran, TDC Environmental, April, pp. 1-105. This report is incorporated by this reference, and is available for public review and inspection at Impact Sciences, Inc., 803 Camarillo Springs Road, Suite A-1, Camarillo, California 93012.

2. Sediment Control
   - Perimeter protection to prevent discharges through silt fences, fiber rolls, gravel bag berms, sand bag barriers, and straw bale barriers (SE-1, 5, 6, 8 and 9).
   - Storm drain inlet protection (SE-10).
   - Resource (Environmentally Sensitive Area) protection through silt fences, fiber rolls, gravel bag berms, sand bag barriers, and straw bale barriers (SE-1, 5, 6, 8, and 9).
   - Sediment capture through sediment traps, storm drain inlet protection, and sediment basins (SE-3, 10, and 2).
   - Velocity reduction through check dams, sediment basins, and outlet protection/velocity dissipation devices (SE-2, 4, and 10).
   - Reduction in off-site sediment tracking through stabilized construction entrance/exit, construction road stabilization, and entrance/exit tire wash (TE-1, 2 and 3).

Similarly, in the post-development condition, treatment of runoff in bioretention, vegetated swales, and extended detention basin treatment BMPs will remove pyrethroid pesticides from stormwater runoff as TSS is reduced. In addition, the source control measures described in the Draft EIR and WQTR will control loads of alternative pesticides applied to the Landmark Village project. Based on the incorporation of the source control measures (summarized in **Response 3**, above), and treatment control BMPs, such as vegetated swales and detention basins, that will effectively remove sediment and associated pesticides, potential post-development impacts associated with urban pesticide use will be less than significant. In addition, from a practical perspective, the Landmark Village tract map site will require clean fill (dirt) to be brought onto the subject property during grading operations in order to raise the grade approximately 10 feet above current ground surface. The approximate 10 feet of fill would eliminate any direct exposure to any current ground surface soils that may be impacted by residual pesticides. As a result, the existing residual pesticides detected on the site will not pose any threat to human health or the environment (see, Landmark Village Draft EIR, Appendix 4.21 [B.A. Environmental letter, dated May 6, 2004, p. 2]).

Response 5

The Draft EIR, Section 4.3, Water Quality, and WQTR, Section 7.9, discuss impacts from increased volume and duration of stormwater, including potential hydromodification impacts that may result from the Landmark Village project. As discussed in those documents, Project Design Features (PDFs) for not only surface water quality control, but also for hydrologic and hydromodification control, are incorporated into the project to reduce stormwater volumes and related impacts, and to ensure stability of receiving waters. These PDFs include site design, source control, treatment control, and hydromodification control BMPs that will be incorporated into the Landmark Village project, and are considered a part of the project for impact analysis.

The purpose of site design BMPs, to the extent feasible, is to mimic the natural hydrologic regime. This site design philosophy is often referred to as Low Impact Development (LID). The primary goals of site design BMPs are to maintain a landscape functionally equivalent to predevelopment hydrologic conditions, and to minimize the generation, and transport, of pollutants of concern. Site design principles incorporated into the Newhall Ranch Specific Plan (of which Landmark Village is a part) include:

Minimize Impervious Area/Maximize Permeability – Principles include preserving natural open space while clustering development, reducing impervious surfaces such as roads, reducing street widths, reducing the land coverage of buildings by building taller and narrower footprints, minimizing the use of impervious materials such as decorative concrete in landscape design, and incorporating detention or infiltration into landscape design.

Minimize Directly Connected Impervious Areas (DCIAs) – Minimizing DCIA can be achieved by directing runoff from impervious areas to vegetated areas (e.g., landscaped areas or vegetated treatment control BMPs) or to infiltration BMPs.

Conserve Natural Areas – Conserving and protecting native soils, vegetation, and stream buffers helps to mimic the site's natural hydrologic regime. This may be accomplished by clustering development within portions of the site to conserve as much natural open space as possible, limiting the extent of clearing and grading of native vegetation, planting additional vegetation, using native and/or climate-appropriate vegetation in parking lot islands and other landscape areas, and preserving riparian areas and wetlands.

Select Appropriate Building Materials – Use of appropriate building materials reduces the generation and discharge of pollutants of concern in runoff (and is therefore also considered a source control BMP).

Protect Slopes and Channels – Protecting slopes and channels reduces the potential for erosion and preserves natural sediment supply.

Site design implementation accounts for the different spatial scales of the Newhall Ranch Specific Plan development. These spatial scales are listed below, from larger to smaller scale:

- Ranch scale – the Newhall Ranch Specific Plan sub-region;
- Village scale – the Landmark Village project;
- Land use scale – single family residential, multi-family residential, commercial, education, parks, and roadways within the Landmark Village project, and
- Lot or parcel scale – individual lots or parcels within the Landmark Village project.

Table A-3, below, lists the site design PDFs that have been incorporated into the Landmark Village project at each spatial scale.

Table A-3
Landmark Village Site Design BMPs

Spatial Scale	Corresponding Site Design BMP
Ranch Scale	The Newhall Ranch Specific Plan (NRSP) clusters development into villages. Approximately 70% (8,335 acres) of the NRSP subregion will remain undeveloped Open Areas.
	A system of Open Areas will weave through the NRSP area. The Open Areas include community parks, prominent ridges, bluffs, slopes, creek beds, and utility and trail system easements, and would often function as a transition between development areas and the Special Management Areas (SMAs), which include the Santa Clara River corridor as well as the Newhall Ranch High Country. The Open Areas are designed to protect significant landforms and natural resources, and to provide an opportunity to protect natural resources from the proposed development.
	The NRSP Land Use Plan designates a total of approximately 5,200 acres for the SMAs. These SMAs are designed to protect the existing natural resources within Los Angeles County's Significant Ecological Areas SEA 20 and SEA 23.
	The nearly 1,000-acre Santa Clara River Corridor SMA is designed to protect the sensitive biological resources in SEA 23. The River Corridor SMA will be dedicated to the Center for Natural Lands Management, and the Center will assume responsibility for management of this area.
	The largest land use designation of the NRSP Land Use Plan is the approximately 4,200-acre High Country SMA/SEA 20. The High Country SMA/SEA 20 is located in the southern portion of the sub-region and includes oak savannahs, high ridgelines, and various canyon drainages including Salt Creek, a regionally significant wildlife corridor that provides an important habitat link to the Santa Clara River. The High Country SMA/SEA 20 will be dedicated in fee to the Newhall Ranch Joint Powers Authority (JPA) consisting of the County of Los Angeles, the City of Santa Clarita, and the Santa Monica Mountains Conservancy, and this JPA will assume responsibility for management of this area.
	As a result of approval of the NRSP, the 1,500-acre portion of the Salt Creek watershed situated in Ventura County, which is under the ownership of Newhall Land, will be dedicated to the JPA. This dedication area is west of Newhall Ranch, and will be managed in the same manner as the High Country SMA, discussed above.
	Two conservation easements have been granted to CDFG for the purpose of conserving populations of spineflower that occur on the NRSP area.
Landmark Village Scale	Impervious areas will be minimized by incorporating landscaped areas into each village, including Landmark Village. Approximately 55 acres (19%) of the approximately 290-acre Landmark Village project tract map area will remain as open area or parks. Additional landscaped and open areas will be provided in conjunction with the residential and commercial uses resulting in approximately 40% of the tract map site being pervious.

Spatial Scale	Corresponding Site Design BMP
Landmark Village Scale (cont'd)	The Landmark Village stormwater treatment system will provide treatment control for 100% of post-development impervious surface via the use of vegetated treatment BMPs that provide for volume reduction through infiltration and evapotranspiration, including one or more of the following volume reduction BMPs: bioretention, vegetated swales, and a dry extended detention basin. See Figure 4.3-2 and Table 4.3-11.
	In areas not subject to mass grading, the smallest site disturbance area possible will be delineated and flagged; temporary storage of construction equipment will be restricted in these areas to minimize soil compaction on site. Site clearing and grading will be limited to the footprint necessary to allow development, access, and provide fire protection.
	The Santa Clara River Corridor and Chiquita Canyon, Long Canyon and Castaic Creek will be largely preserved, and development impacts to these resources will be minimized. An average buffer (the distance between the existing riparian resources and the Regional River Trail) of 100 feet will be provided along the Santa Clara River corridor; additionally, commercial, residential, and mixed use development will be setback 100 feet from the Regional River Trail outside of the Santa Clara River SMA/SEA 23, which will further separate development from the Santa Clara River corridor.
	Natural slopes and native vegetation on slopes adjacent to the Santa Clara River will be restored and enhanced.
Land Use Scale	Streets, sidewalks, and parking lot aisles will be constructed to the minimum widths specified in the NRSP and in compliance with regulations for the Americans with Disabilities Act and safety requirements for fire and emergency vehicle access.
	Portions of the Santa Clara River Regional River Trail will incorporate granular materials, or other pervious materials.
	Native and/or non-native/non-invasive, climate-appropriate vegetation that requires less watering and chemical application will be utilized within the common area landscaping in commercial areas and multi-family residential areas.
	Impervious surfaces will be minimized in common area landscape design for commercial areas and multi-family residential areas.
	Landscape watering in common areas, commercial areas, multiple family residential areas, and in parks will use efficient irrigation technologies, including centralized irrigation controls.
Lot	Bioretention will be placed within the road right-of-way along "A" Street.
	Runoff from most sidewalks, walkways, trails, and patios will be directed into adjacent landscaping or to vegetated swales.
	Bioretention areas or vegetated swales will collect and treat runoff from some of the commercial and multi-family residential areas. These bioretention areas will be located in parking lot islands and other on-site landscaped areas.
	Landscape areas will be integrated into each site.
	Porous pavement will be used in some parking and low traffic areas.
	Building materials for roof gutters and downspouts will not include copper or zinc.
	Commercial and multi-family residential structures will direct rooftop runoff through landscaped areas.

The project includes as project design features BMPs that will not only provide treatment control, but also will provide volume reduction. The Draft EIR impact analysis modeling for volume reductions only considered the structural treatment BMPs (bioretention, swales, and extended detention basin), and did not take into account the other site design PDFs listed above that would also improve water quality and reduce runoff volumes. In this respect, the modeling results are conservative, i.e., tend to overestimate runoff volumes and pollutant loads and concentrations.

An analysis of the monitored inflow and outflow data contained in the International Stormwater BMP Database found that dry detention basins reduced runoff volumes by an average of 30 percent (comparison of inflow to outflow), while biofilters reduced volumes by almost 40 percent (Strecker, E. et al., 2004).[6] Based on this analysis, a conservative estimate of 25 percent of the Landmark Village project's inflow to the vegetated swales and bioretention areas was assumed to infiltrate and/or evapotranspire. An extended detention basin was assumed to remove 20 percent of volume through evapotranspiration and infiltration.

Taking into account only the volume reductions provided by the planned swales, bioretention areas, and detention basin, the increase in average annual storm water runoff volume from the project area is predicted to be limited to approximately 148 acre-feet/year. Further, water balance modeling shows that all post-development dry weather discharges will be eliminated. In addition, the above described site design PDFs will further reduce the stormwater runoff volume from the project area, further avoiding and minimizing potential hydromodification impacts. Thus, the Landmark Village project will not have significant hydromodification impacts on the Santa Clara River or its tributaries.

Response 6

The LID techniques discussed in the Draft EIR Section 4.3 will not require special exceptions to land use codes or ordinances within the County of Los Angeles and are consistent with the Newhall Ranch Specific Plan.

Response 7

The LID techniques discussed in the Draft EIR will not require special exceptions to land use codes or ordinances within the County of Los Angeles and are consistent with the Newhall Ranch Specific Plan.

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6 Analyses of the Expanded EPA/ASCE International BMP Database and Potential Implications for BMP Design, World Water and Envt. Cong. Proc. (June 27-July 1, 2004). This report is incorporated by this reference and available for public review and inspection at Impact Sciences, Inc., 803 Camarillo Springs Road, Suite A-1, Camarillo, California 93012.

Response 8

The potential impacts of off-site project components and grading are described in the Landmark Village Draft EIR, and water quality-related impacts are summarized below.

CUT AND FILL GRADING

The cut and fill grading operation would include fill imported to the Landmark Village tract map site from a 215-acre borrow site (and related haul routes), located south of the Santa Clara River (the Adobe Canyon borrow site), grading to accommodate roadway improvements to SR-126, and debris basins for stormwater flows collected by the tract map's storm drainage system on approximately 120 acres of land, located directly north of SR-126 within Chiquito Canyon (Chiquito Canyon grading site).

The Adobe Canyon borrow site is located in the northeastern portion of the approved Newhall Ranch Specific Plan, just south of the Santa Clara River and adjacent to Long Canyon. The Adobe Canyon borrow site would be used to import fill to the Landmark Village tract map site. Off-site grading also is required in the low-lying hills north of SR-126, east of Chiquito Canyon Road, and within, and adjacent to, the banks of the Santa Clara River at and downstream of the tract map site (Chiquito Canyon grading site). This area would be graded to accommodate roadway improvements to SR-126, and debris basins for stormwater flows collected by the tract map's storm drainage system. All of these improvements are proposed on primarily unimproved land within the approved Newhall Ranch Specific Plan.

The primary hydrologic effect of the grading on the two sites is that storm flows would runoff each site at slower rates than under existing conditions, as slopes will be reduced and no new impervious surfaces will be added, so material changes in the existing drainage patterns within the borrow sites will not result from off-site grading operations, and similarly substantial increases in volume of runoff are not predicted A series of benches, swales and debris basins would also be constructed at each site to collect, convey and release runoff in a controlled manner, but existing catchment areas, discharge points, runoff volumes and durations would generally be retained or slightly reduced in the post-development condition.

UTILITY CORRIDOR

A utility corridor, which runs parallel to SR-126, from the western boundary of the tract map site to the approved Newhall Ranch WRP near the Los Angeles County/Ventura County line, from the eastern boundary of the tract map site to the Old Road/Interstate 5 (I-5), and then south to the existing Valencia WRP, would extend municipal services to and from the tract map site. The utility corridor alignment represents disturbed, vacant land containing ruderal vegetation and disturbed/developed uses. Topography along the utility corridor is relatively flat with elevations generally around 900 feet msl.

Impacts within the utility corridor would primarily consist of temporary impacts associated with grading and trenching to install underground utility lines. The area would be restored primarily with pervious vegetation and a future trail, while impervious surface will be limited to an access road/trail up to 15 feet in width. The access road will be designed to drain runoff into adjacent vegetation constituting the equivalent of swales, filter strips, or bioretention areas. As a result, the scope of the utility corridor and adjunct facilities is not such that it would result in substantial changes to the existing drainage pattern or increases in runoff flow rates, volumes or durations, and all runoff from impervious surface would receive treatment via vegetated swales, filter strips, or bioretention areas.

POTABLE AND RECLAIMED WATER TANK(S)

There are two options for placement of potable water tank(s). Under the first water delivery option, two new potable water tanks and related lines/infrastructure would be constructed. The first potable water tank would be constructed near an existing water tank located in the Valencia Commerce Center, but at a slightly higher elevation; and the second tank would be built further west, in upland areas of Chiquito Canyon. Under the second option, one new potable water tank and three pressure regulating stations connected to a network of 18- to 20-inch water mains that generally follow the southern right-of-way for SR-126 and major roadways would be constructed. The new water tank would be constructed near the existing water tank in the Valencia Commerce Center, at a slightly lower elevation.

To supply reclaimed water to the tract map site and provide for a backbone system to serve other areas of Newhall Ranch, a reclaimed piping system would be constructed from the proposed Newhall Ranch WRP through the tract map site to the existing Valencia WRP. This pipeline would be constructed starting from the west along the SR-126 right of way approximately 10,000 feet to the proposed tract map site. The line will pass through the tract map site approximately 11,000 feet along the future spine road alignment. The line will then continue eastward where it will connect with the existing Valencia WRP. This reclaimed waterline will extend east along the north and south right-of-way of SR-126 and the south right-of-way of Henry Mayo Drive. This portion of the reclaimed waterline would be approximately 10,000 LF. At the point where SR-126 merges with I-5, the line would then head south along the western right-of-way along The Old Road where it would connect to the existing Valencia WRP. This southerly section is approximately 6,200 feet in length. For reclaimed water storage, the Round Mountain Tank, which is currently used for potable water, would be converted to a reclaimed water tank.

Since waterlines would be constructed as underground lines within already existing impact areas, only temporary impacts are associated with these facilities. Potable water tank construction is planned on disturbed land containing non-native grasslands and coastal sage scrub. In the post-development condition, runoff from the impervious area of the water tank will continue to sheet flow into adjacent vegetation constituting the equivalent of swales, filter strips, or bioretention areas. Runoff from the water

tank pad would be reduced as a result of re-planting the pad with native vegetation. Furthermore, the water tank pads would be graded and flattened, which would decrease the coefficient of runoff from the pads. As a result, in the post-development condition, all runoff from the water tanks would receive treatment equivalent to that provided by swales, and there would be no substantial change in drainage patterns, and a net decrease in runoff, so and the impact of installation of water tanks and associated lines would be less than significant.

OTHER GRADING AND IMPROVEMENTS

Additional off-site grading and improvements would be related to the construction of the Long Canyon Road Bridge and the widening of the Castaic Creek/SR-126 bridge, and related storm drainage improvements. These improvements would be located on flat, vacant land along the Santa Clara River. The Long Canyon Bridge Improvements would generally consist of bridge abutments (including riprap) and piers, supporting bridge span and roadway. Runoff from this bridge will be directed via drainage improvements to the extended detention basin within the tentative tract map site. The Castaic Creek/SR-126 bridge generally consist of widened bridge abutments (including riprap) supporting a widened bridge span and roadway. Drainage facilities will direct runoff from the bridge areas to vegetated swale or equivalent treatment. As a result, in the post-development condition, all runoff from the bridge improvements would receive treatment equivalent to that provided by swales and there would be no substantial change in drainage patterns, and a net decrease in runoff, so the impact of installation of the bridges and associated grading would be less than significant.

CONSTRUCTION PHASE IMPACTS

During construction, construction related impacts of off-site grading and improvements, impacts will be minimized through compliance with the State Water Resource Control Board's Construction General Permit. This permit requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP), which must include erosion and sediment control BMPs that will meet or exceed measures required by the Construction General Permit, as well as BMPs that control other potential construction-related pollutants.

Erosion control BMPs are designed to prevent erosion, whereas sediment controls are designed to trap sediment once it has been mobilized. An SWPPP will be developed as required by, and in compliance with, the Construction General Permit and the County of Los Angeles Standard Conditions. The Construction General Permit requires the SWPPP to include a menu of BMPs to be selected and implemented based on the phase of construction and weather conditions to effectively control erosion and sediment to the BAT/BCT standard. The following types of BMPs will be implemented during construction:

1. Erosion Control (BMPs numbered EC-3 through EC-7 and WE-1 in the Stormwater Best Management Practice Handbook - Construction (CASQA 2003))
   - Physical stabilization through hydraulic mulch, soil binders, straw mulch, bonded fiber matrices, and erosion control blankets (i.e., rolled erosion control products).
   - Limiting the area and duration of exposure of disturbed soils.
   - Soil roughening of graded areas (through track walking, scarifying, sheepsfoot rolling, or imprinting) to slow runoff, enhance infiltration, and reduce erosion.
   - Vegetation stabilization through temporary seeding to establish interim vegetation.
   - Wind erosion (dust) control through the application of water or other dust palliatives as necessary to prevent and alleviate dust nuisance.
2. Sediment Control
   - Perimeter protection to prevent discharges through silt fences, fiber rolls, gravel bag berms, sand bag barriers, and straw bale barriers (SE-1, 5, 6, 8 and 9).
   - Storm drain inlet protection (SE-10).
   - Resource (Environmentally Sensitive Area) protection through silt fences, fiber rolls, gravel bag berms, sand bag barriers, and straw bale barriers (SE-1, 5, 6, 8, and 9).
   - Sediment capture through sediment traps, storm drain inlet protection, and sediment basins (SE-3, 10, and 2).
   - Velocity reduction through check dams, sediment basins, and outlet protection/velocity dissipation devices (SE-2, 4, and 10).
   - Reduction in off-site sediment tracking through stabilized construction entrance/exit, construction road stabilization, and entrance/exit tire wash (TE-1, 2 and 3).
3. Waste and Materials Management
   - Management of the following types of materials, products, and wastes: solid, sanitary, concrete, hazardous and equipment-related wastes (MW-1, 2, and 4 through 10 and NS-8 through 10).
   - Protection of soil stockpiles through covers, the application of water or soil binders, and perimeter control measures (MW-3).
4. Non-stormwater Management
   - BMPs or good housekeeping practices to reduce or limit pollutants at their source before they are exposed to stormwater, including such measures as: water conservation practices, vehicle and equipment cleaning and fueling practices (NS-1 through 16).
5. Training and Education
   - Training of individuals responsible for SWPPP preparation, implementation, and permit compliance, including contractors and subcontractors.
   - Signage (bilingual, if appropriate) to address SWPPP-related issues (such as site clean up policies, BMP protection, washout locations, etc).
6. Maintenance, Monitoring and Inspections
   - Performing routine site inspections and inspections before, during (for storm events >24 hours), and after storm events.

- Implementing maintenance and repairs of BMPs as indicated by routine and storm-event inspections.
- Preparation and implementation of a Sampling and Analysis Plan for non-visible pollutants.

These construction site management BMPs will be implemented during the dry season and wet season as follows:

YEAR-ROUND CONSTRUCTION PHASE BMPS

a. Wind erosion BMPs (dust control).

b. Soil roughening of graded areas (track walking, scarifying, sheepsfoot rolling, or imprinting)

c. Sediment control BMPs at the down gradient site perimeter and all operational storm drain inlets internal to the planning area.

d. Off-site tracking BMPs.

e. Appropriate waste management and materials pollution BMPs.

f. Appropriate non-storm water BMPs to prevent or reduce the contamination of stormwater by construction activities and materials.

g. An action plan to deploy standby erosion control, sediment control and other appropriate BMPs (covering stockpiles, secondary containment/covering of construction materials, etc.) to protect exposed portions of the site within 48 hours of a 40 percent chance of predicted rain.

h. Sufficient standby BMP materials to implement the above action plan.

i. Deployment of post-construction erosion control BMPs as soon as practicable.

j. BMPs for construction dewatering will include infiltration of clean groundwater; on-site treatment using suitable treatment technologies; on site or transport off site for sanitary sewer discharge with local sewer district approval; or use of a sedimentation bag for small volumes of localized dewatering.

WET SEASON CONSTRUCTION PHASE BMPS

a. Limiting the area and duration of exposure of disturbed soil areas. This may be accomplished by retention of natural vegetation in areas not scheduled for immediate grading, phasing the grading, and stabilizing disturbed areas quickly.

b. Implementation of an effective combination of erosion and sediment control measures on all disturbed areas.

c. Sufficient standby BMP materials to implement the above weather triggered action plan.

The Construction General Permit does not recognize a wet season by dates; therefore, the wet season requirements will be implemented year round if there is a 40 percent chance of predicted rain.

Thus, through the implementation of BMPs and site design PDFs, the off-site grading and improvements will not result in significant adverse water quality or hydromodification impacts.

Response 9

Because the Landmark Village project implements a part of the Newhall Ranch Specific Plan, the Landmark Village Draft EIR is tiering from the certified Newhall Ranch Revised Draft Program EIR (March 1999) and Revised Additional Analysis (May 2003) in accordance with Public Resources Code section 21093(a) and *CEQA Guidelines* Section 15168(c). Public Resources Code section 21093 encourages a lead agency to "tier" from a previously certified program EIR, whenever feasible. (*CEQA Guidelines* Sections 15168(c), 15385). Cumulative impacts on the Santa Clara River associated with development of the entire Newhall Ranch Specific Plan were fully evaluated in the certified Newhall Ranch Specific Plan Program EIR as well as the Landmark Village Draft EIR, Sections 4.2, Hydrology, and 4.5, Flood Modifications.

The comment requests further clarification of cumulative hydromodification impacts of the Landmark Village project in relationship to other projects in the Santa Clara watershed, and specifically assessment of the "total miles of hydromodification from all the projects of the Specific Plan." The term hydromodification is very broad, and can refer both to physical alterations to natural drainages and to adverse affects on natural receiving waters caused by changes in flow, which in turn result in erosion or destabilization of natural drainages. In this case, it appears that the comment is requesting a summary of the analysis of cumulative impacts associated with physical alterations to natural drainages and Section 401 certification of those alterations, rather than cumulative impacts to natural drainages resulting from flow. Therefore, this response will focus on summarizing the conclusions of the Newhall Ranch Specific Plan Program EIR and the Landmark Village Draft EIR with respect to proposed physical alterations to natural drainages. Please see Draft EIR, Section 4.3, Water Quality, and WQTR, Sections 7.9.1 and 8.3, and prior EIR sections referenced therein, for a discussion of cumulative hydromodification impacts resulting from proposed changes in flow regime associated with development of the project in the context of the Newhall Ranch Specific Plan and other projects within the watershed.

The Newhall Ranch Specific Plan Conceptual Backbone Drainage Plan provide drainage and flood control protection to developed uses, while minimizing impacts to the Santa Clara River, Castaic Creek, Chiquita Canyon, and San Martinez Grande. The Conceptual Backbone Drainage Plan requires that all Newhall Ranch Specific Plan projects, including Landmark Village, be implemented in accordance with certain criteria to assure avoidance of natural resources within these channels. For example, the following criteria guide preparation of drainage improvement plans for all Newhall Ranch Specific Plan projects:

1. Flood corridor must allow for the passage of Los Angeles County Capital Flood discharge without the permanent removal of natural River vegetation (except at bridge crossings);

2. Bank stabilization for the River will generally be established outside of the "waters of the United States" as defined by federal laws and regulations and as determined by the delineation completed by the ACOE in August 1993;
3. Where the ACOE delineation width is insufficient to contain the Capital Flood flow, the flood corridor will be widened by an amount sufficient to carry the Capital Flood flow without the necessity of permanently removing vegetation or significantly increasing velocity; and
4. Soil cement will occur only where necessary to protect against erosion adjacent to the proposed development. Where existing bluffs are determined to be stable and there is no adjacent proposed development, no bank protection will be built.

Proposed bank protection will consist primarily of buried soil cement to provide scour and freeboard flood control protection. Soil cement bank protection provides a stable riverbank protection material, in terms of both surface erosion and structural stability. Additionally, soil cement bank protection will be mostly buried. The exposed top portion of the soil cement will be aesthetically and vegetatively compatible with the natural earth and vegetated bank area.

For the Newhall Ranch Specific Plan, a total of 38,400 linear feet of bank protection along the Santa Clara River, including accessory storm drain outfalls, was analyzed in the certified Newhall Ranch Specific Plan Program EIR. In addition, the previously certified Program EIR analyzed impacts to the Santa Clara River in connection with the installation of the approved three bridges.

Of that total, the Landmark Village project would implement the following subset of those previously analyzed and approved physical alterations to the Santa Clara River:

- Approximately 18,800 linear feet (LF) of River and Creek bank stabilization (buried bank stabilization) would be constructed in conjunction with the Landmark Village project. This would include approximately 11,000 LF fronting the tract map site, 6,600 LF on the south bank downstream (west) of Long Canyon Road Bridge, and 1,200 LF downstream of the project on the north bank, east of the Newhall Ranch WRP along the utility corridor.

- Approximately 6,600 LF of turf reinforcement mats (TRMs) or similar is proposed along the utility corridor along the north bank of the River extending west from the Landmark Village tract map site. TRMs are designed to reinforce vegetation at the root and stem allowing vegetation to be used as erosion control in areas where lower, non-erosive velocities in the capital storm are present.

- The Long Canyon Road Bridge includes eleven reinforced concrete piers spaced approximately 100 feet apart combined with bridge abutments (riprap) and bank protection.

- Widening of the SR-126 Castaic Creek bridge, resulting in the addition of approximately 500 LF of reinforced concrete along the Creek bank to be incorporated into the existing bridge abutments.

- Eleven (11) storm drain outlets will be constructed downstream of treatment BMPs, with associated localized energy dissipaters, consisting of either riprap or other larger reinforced concrete standard impact-type dissipaters.

- Finally, most of the buried bank stabilization and TRMs would be located outside of the existing Santa Clara River corridor. For example, soil cement proposed on the north side of the River near the confluence with Castaic Creek would be constructed within agricultural land thereby increasing the riparian corridor after implementation of the project.

The potential cumulative affects of these physical alterations on both the stability, hydrology, and hydraulics of the Santa Clara River, as well as to the jurisdictional waters, habitat and the biological function and value of the Santa Clara River have been analyzed in the previously certified Newhall Ranch Specific Plan Program EIR, including the Revised Additional Analysis (Section 2.3.6), and the Landmark Village Draft EIR (Sections 4.4, Biota, and 4.5, Floodplain Modifications).

Furthermore, the Landmark Village Draft EIR (Sections 4.2, Hydrology, and 4.5, Floodplain Modifications) concluded that the changes in flows and reduction in floodplain area caused by bank protection would not create a significant increase in overall velocities or water surface elevation, because the volume of flow carried in these shallow, slow-moving areas along the margins of the Santa Clara River is small. Moreover, variations are localized and limited in scope, especially when viewed in the entirety of the Santa Clara River corridor within the Newhall Ranch Specific Plan site and downstream. Therefore, the overall mosaic of habitats in the river would be maintained because the key hydraulic characteristics would not be significantly different under the Newhall Ranch Specific Plan. Based on these results, the proposed bank protection and bridges associated with the Newhall Ranch Specific Plan would not cause significant adverse changes to the hydraulic characteristics of the Santa Clara River, and, therefore, would not alter or adversely affect the amount and pattern of aquatic, wetland, and riparian habitats in the river.

Please see also **Response 15**, to letter from the County of Ventura, Resource Management Agency, dated January 19, 2007.

Response 10

The comment is noted. No further response is required given that the comment does not address or question the content of the Draft EIR.

Letter No. A7

STATE OF CALIFORNIA
Governor's Office of Planning and Research
State Clearinghouse and Planning Unit

Arnold Schwarzenegger
Governor

Cynthia Bryant
Director

Memorandum

RECEIVED
JAN 29 2007

Date: January 24, 2007

To: All Reviewing Agencies

From: Scott Morgan, Senior Planner

Re: SCH # 2004021002
The Landmark Village Project, Project No. 00-196, TR 53108/ CP00-196/ROAK-OT00-196/RCUP200500112

Pursuant to the attached letter, the Lead Agency has extended the review period for the above referenced project to January 31, 2007 to accommodate the review process. All other project information remains the same.

1

cc: Daniel Fierros
Los Angeles County Department of Regional Planning
320 West Temple Street
Los Angeles, CA 90012

1400 TENTH STREET P.O. BOX 3044 SACRAMENTO, CALIFORNIA 95812-3044
TEL (916) 445-0613 FAX (916) 323-3018 www.opr.ca.gov

Los Angeles County
Department of Regional Planning

Planning for the Challenges Ahead

Bruce W. McClendon, FAICP
Director of Planning

NOTICE OF PUBLIC REVIEW PERIOD TIME CONTINUATION
TO THE
COMPLETION AND AVAILABILITY
DRAFT ENVIRONMENTAL IMPACT REPORT

LANDMARK VILLAGE
County Project No. 00-196
Tentative Tract Map No. TR53108
RCUP-CP00-196/ROAK-OT00-196
RPA-SP00-196/ RPA-LP00-196
RCUP-T200500112/RHWY-HR00-196/RPA-PA00-196
STATE CLEARINGHOUSE NO. 2004021002

The Department of Regional Planning has been receiving several requests to extend the DEIR public review period. At this time, the comment period will be continued up until the January 31, 2007 hearing date at which time the Regional Planning Commission (RPC) will be informed of these requests. The RPC will determine at the hearing to what date if the public review period will subsequently be extended. If you are unable to attend the hearing, please call the phone number below for further information.

To ensure public access to the DEIR, copies of the document will available for review at the County libraries listed below:

Newhall County Library
22704 West 9th Street
Newhall, CA 91321

Canyon County Jo Anne Darcy Library
18601 Soledad Canyon Road
Canyon Country, CA 91351-3721

Valencia County Library
223743 West Valencia Boulevard
Valencia, CA 91355

Copies of the DEIR will also be available for public review Monday through Thursday, 7:30 a.m. to 6:00 p.m. at: County of Los Angeles

Department of Regional Planning
Impact Analysis Section, Room 1348
320 West Temple Street
Los Angeles, CA 90012

RECEIVED
JAN 23 2007
STATE CLEARING HOUSE

Please submit written comments or direct any questions concerning this change or the DEIR to Mr. Daniel Fierros of the Department of Regional Planning at the above address or (213) 974-6461.

320 West Temple Street • Los Angeles, CA 90012 • 213-974-6411 • Fax: 213-626-0434 • TDD: 213-617-2292

Notice of Completion

Mail to: State Clearinghouse, P. O. Box 3044, Sacramento, CA 95812-3044 (916) 445-0613

See NOTE below
SCH # 2004021002

Project Title *The Landmark Village Project, Project No. 00-196, CR 11108; CPSO-196/ROAK-OTHO-196/RCUP200100-L2*
Lead Agency *L.A. County Department of Regional Planning* — **Contact Person:** *Daniel Fierros*
Street Address: *320 West Temple Street* — **Phone** *(213) 974-6461*
City: *Los Angeles* **Zip:** *90012* — **County:** *Los Angeles*

Project Location
County: *Los Angeles* — **City/Nearest Community:** *Santa Clarita*
Cross Streets *Chiquita Canyon Rd, Commerce Center Drive and Highway 126* — **Total Acres** *291.2 (250 Acres) off-site*
Assessor's Parcel No. *2826-001-003* — **Section** ____ **Twp.** ____ **Range** ____ **Base:** *San Bernardino*
Within 2 Miles State Hwy #: *126* — **Waterways:** *Custer Creek, Santa Clara* ____
Airports: *none* — **Railways:** *none* — **Schools:** *none*

RECEIVED
NOV 2 0 2006
STATE CLEARING HOUSE

Document Type
CEQA: ☐ NOP ☐ Early Cons ☐ Neg Dec ☒ Draft EIR ☐ Supplement/Subsequent ☐ EIR (Prior SCH No.) ☐ Other ____
NEPA: ☐ NOI ☐ EA ☐ Draft EIS ☐ FONSI ☐ Other ____ ☐ Joint Document ☐ Final Document ☐ Other ____

Local Action Type
☐ General Plan Update ☒ General Plan Amendment ☐ General Plan Element ☒ Local Plan Amendment ☒ Specific Plan Amendment ☐ Master Plan ☐ Planned Unit Development ☐ Site Plan ☐ Rezone ☐ Prezone ☐ Use Permit ☒ Land Division (Subdivision, Parcel Map, Tract Map, etc.) ☐ Annexation ☐ Redevelopment ☐ Coastal Permit ☒ Other *Oak Tree Permit*

Development Type
☒ Residential *Units 1444* *Acres 112.5*
☐ Office *Sq ft* ____ *Acres* ____ *Employees* ____
☒ Commercial *Sq ft 1.5 mil* *Acres 39.3* *Employees* ____
☐ Industrial *Sq ft* ____ *Acres* ____ *Employees* ____
☒ Educational *Elementary School - 7.0 acres*
☒ Recreational *Open Space 62.6 acres*
☒ Water Facilities *Type Water Tanks* *MGD* ____
☐ Transportation *Type* ____
☐ Mining *Mineral* ____
☐ Power *Type* ____ *Watts* ____
☐ Waste Treatment *Type* ____
☐ Hazardous Waste *Type* ____
☒ Other: *Roads - 53.5 acres*

Project Issues Discussed In Document
☒ Aesthetic/Visual ☒ Agricultural Land ☒ Air Quality ☒ Archeological/Historical ☐ Coastal Zone ☒ Drainage/Absorption ☒ Economic/Jobs ☐ Fiscal
☒ Flood Plain/Flooding ☒ Forest Land/Fire Hazard ☒ Geologic/Seismic ☒ Minerals ☒ Noise ☒ Population/Housing Balance ☒ Public Services/Facilities ☒ Recreation/Parks
☒ Schools/Universities ☒ Septic Systems ☒ Sewer Capacity ☒ Soil Erosion/Compaction/Grading ☒ Solid Waste ☒ Toxic/Hazardous ☒ Traffic/Circulation ☒ Vegetation
☒ Water Quality ☒ Water Supply/Groundwater ☒ Wetland/Riparian ☒ Wildlife ☒ Growth Inducing ☒ Land Use ☒ Cumulative Effects ☒ Other

Present Land Use/Zoning/General Plan Use
Agricultural/Specific Plan/Specific Plan

Project Description
The attached DEIR has been prepared for the above project located within the Newhall Ranch Specific Plan in western unincorporated Los Angeles County, north of the Santa Clara River, South, and north of Highway 126, east of Ventura County boundary and west of Interstate 5 (I-5). The project consists of 618 lots to include a maximum of 1,444 residential units, a maximum of 1,353,000 square feet of non-residential mixed-used space, an elementary school, a community park, three private recreational facilities, open space, and river trailheads. The site is currently used for agricultural purposes and contains miscellaneous, ancillary sheds for agricultural storage and dirt roads. There is southern willow and cottonwood riparian habitat that extends to the central portion of the site along the southern boundary of the tract map. Three oak trees exist on site. Chiquita Canyon Landfill is located to the north of the project site. Several active and abandoned oil wells are located within the tract boundary. The project also includes all on-site and off-site infrastructures necessary to support the proposed project, including a domestic water system, sanitary sewer system, and a drainage network. Some off-site infrastructure improvements will be within SEA 23, Santa Clara River, containing habitat for the endangered stickleback. To protect the development from flood hazards, a bank stabilization system will be installed along portions of Santa Clara River. This Project will require a 2 million cubic yards of removal and recompaction of existing materials, and approximately 5.8 million cubic yards of imported fill in the off-site alluvial canyon borrow site. There are two water tanks north of Highway 126 that will service the project site. The EIR analyzes the construction of the Long Canyon Road Bridge across the Santa Clarita River.

State Clearinghouse Contact: (916) 445-0613

State Review Began: 11 - 20 - 2006

SCH COMPLIANCE: 1 - 31 - 2007

Extended Review

Please note State Clearinghouse Number (SCH#) on all Comments

SCH#: **2004021002**

Please forward late comments directly to the Lead Agency

AQMD APCD: 33

(Resources: 11 - 29)

Project Sent to the following State Agencies

X Resources
____ Boating & Waterways
____ Coastal Comm
____ Colorado Riv Bd
X Conservation
X Fish & Game # 5
____ Delta Protection Comm
____ Forestry & Fire Prot
X Historic Preservation
X Parks & Rec
____ Reclamation Board
____ Bay Cons & Dev Comm
X SWR
____ OES (Emergency Svcs)

Bus Transp Hous
____ Aeronautics
X CHP
X Caltrans # 7
____ Trans Planning
____ Housing & Com Dev
____ Food & Agriculture
X Health Services

State/Consumer Svcs
____ General Services
Cal EPA
____ ARB - Airport Projects
____ ARB - Transportation Projects
____ ARB - Major Industrial Projects
X Integrated Waste Mgmt Bd
____ SWRCB: Clean Wtr Prog
____ SWRCB: Wtr Quality
____ SWRCB: Wtr Rights
X Reg. WQCB # 4
X Toxic Sub Ctrl-CTC

Yth/Adlt Corrections
____ Corrections

Independent Comm
____ Energy Commission
X NAHC
____ Public Utilities Comm
____ State Lands Comm
____ Tahoe Rgl Plan Agency
____ Conservancy

A7. Letter from Governor's Office of Planning and Research, dated January 24, 2007

Response 1

The comment provides factual background information only and does not raise an environmental issue within the meaning of CEQA. The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not raise an environmental issue regarding the content of the Draft EIR, no further response is required.

Letter No. A8

STATE OF CALIFORNIA—BUSINESS, TRANSPORTATION AND HOUSING AGENCY ARNOLD SCHWARZENEGGER, Governor

DEPARTMENT OF TRANSPORTATION
DISTRICT 7, OFFICE OF PUBLIC
TRANSPORTATION AND REGIONAL PLANNING
IGR/CEQA BRANCH, MS 16
100 SOUTH MAIN STREET
LOS ANGELES, CA 90012
PHONE (213) 897-3747
FAX (213) 897-1337

Flex your power!
Be energy efficient!

January 30, 2007

Mr. Daniel Fierros
County of Los Angeles,
Department of Regional Planning
320 West Temple Street
Los Angeles, CA 90012

Re: ***Landmark Village (formerly River Village)***
Vesting Tentative Tract Map No. 53108
Draft Environmental Impact Report
IGR/CEQA No. 061131/EA, SCH#2004021002
Vic. LA/126/0.0-5.00, LA-005-PM R53.9

Dear Mr. Fierros:

Thank you for including the California Department of Transportation (Caltrans) in the environmental review process for the Draft Environmental Impact Report prepared for the Landmark Village development project. Landmark Village is the first subdivision tract map development of the Newhall Ranch Specific Plan. The Landmark Village Tract Map proposes construction of 1,444 residential dwelling units, 1.033 million square feet of mixed-use/commercial uses, an elementary school, and recreational facilities. This comment letter dated January 30, 2007, containing minor revisions, supersedes our previous letter, which was transmitted by FAX on January 22, 2007. We have reviewed document and have the following comments: 1 2

State Route 126
The traffic analysis determined the proposed development would result in significant transportation impacts to the following intersections at State highway 126 (SR-126): Long Canyon Road-Chiquito Canyon Road, Walcott Way, and Commerce Center Drive. We note that mitigation measures are recommended to reduce the impacts at all of these intersections to a level less than significant. Project related transportation impacts to the SR-126/I-5 Interchange have been mitigated to a less than significant level by the recently completed widening reconstruction of the SR-126 bridge over-crossing. Planned improvements to the Commerce Center Drive interchange and widening of SR-126 from I-5 to Commerce Center Drive are projected to be completed by 2008. **To avoid significant transportation impacts, we request completion of planned improvements prior to or concurrently with build-out of Landmark Village.** If not, significant transportation impacts would be expected at these locations, and they would need to be addressed in this environmental impact report. 3

"Caltrans improves mobility across California"

Project Initiation Document (PID)

Typically, the Department (Caltrans) designs transportation improvements to a 20-year horizon, not to 2010 as the study has done. To implement the proposed mitigation measures, a Project Initiation Document (PID) that includes an alternative analysis will be needed and further analysis will be necessary. 4

Feasibility Study Report

A Feasibility Study Report was prepared by the project's consultant with Caltrans oversight to determine future roadway improvements on State Route 126. The Feasibility Study includes the following recommendations for improvements to SR-126:

- Widening of SR-126 to four-lanes in each direction from Commerce Center Drive to Long Canyon Road. 5
- New at-grade, signalized intersection at Walcott Way
- New at-grade, signalized intersection at Long Canyon Road/Chiquito Canyon Road

We note that at buildout of Phase Three (3) of Landmark Village (2010), a third through lane would be required at the Walcott Way and Long Canyon Road intersections. Although the Feasibility Study Report references the widening of SR-126, the Draft EIR does not mention the SR-126 widening. The EIR needs to explicitly state that the project (Newhall Ranch Specific Plan) applicant will fund widening of SR-126 from I-5 to Long Canyon Road.

Transportation/Traffic Mitigation Plan

We recommend that Transportation/Traffic Mitigation Plan be prepared detailing all project related mitigation measures for all phases of the project, including improvements to SR-126 and to Interstate 5. It needs to state that the applicant (Newhall Land and Farm) will be responsible for fully funding traffic mitigation to SR-126 including the widening of mainline through lanes, timely with development. We acknowledge that the applicant may seek other sources of funding. Section SP 4.8-7 of the document states: " Construction or funding of any required facilities shall not preclude the applicant's ability to seek state, federal, or local funding for these facilities." However, if the project's efforts to secure state, federal or local funding are unsuccessful, the developer is still responsible to fund the improvements. The mitigation plan needs to be **consistent** with the feasibility study report, and link improvements identified in the feasibility study report with future subdivision maps or phases of Newhall Ranch Specific Plan. 6
The Transportation/Mitigation Plan needs to describe the "triggers" for initiation of specific mitigation measures, tied to both the project phases, the number of units built, and/or other parameters. We recommend that the Transportation/Traffic Mitigation Plan be included as part of the Final Environmental Impact Report.

Reserving Right-of-Way

We acknowledge the statement on page 4.7-22, that the development project would construct temporary intersections with SR-126, which would be consistent with the project's planned potential future grade-separated crossings for Long Canyon Road and Walcott Way. We 7
recommend that enough right-of-way be reserved for potential future grade-separated interchanges. The final design for both new access intersections will be determined by a Project Initiation Report that includes an alternative analysis. The pending decision to change highway 8
designation from conventional highway to expressway may also influence the final intersection design and the number of access points as well.

"Caltrans improves mobility across California"

Captured Vehicle Trips

As stated in our previous comment letter, we request for further clarification as to the assumption of unusually high percentage of captured vehicle trips, 30%. It is conceivable that higher captured trips could be achieved in multi-use development, when it includes affordable housing and retail uses. We remind you that school and office uses will also attract vehicle trips from outside the development as well. 9

Interstate 5

Regarding transportation impacts to Interstate-5, the traffic/access report does not indicate significant impacts as a result of the buildout of Landmark Village. However, through mitigation measures LV-4.7-21 (as shown in the document), the project applicant has committed to participate in capacity augmentation improvements on a fair-share basis for Interstate 5. 10

Contingency Mitigation Plan

The 2030 cumulative impact analysis for Interstate5 shown on Table 4.7-30 assumes the addition of a High Occupancy Lane (HOV) in the area. It is true that over the years various studies have recommended the addition of HOV lanes, and truck lanes in the area; however, its construction and completion prior to the buildout of Newhall Ranch is not certain. If capacity augmentation improvements such as HOV lanes, truck lanes, or mixed-flow lanes are not built prior to buildout of Newhall Ranch, significant transportation impacts would occur as a result. We request that alternate traffic mitigation measures and/or a contingency plan based on a no-HOV/truck lanes scenario by 2030 be prepared. 11

Enhanced Transit Usage & Other Smart-Growth Strategies

We encourage the implementation of Smart-Growth Strategies such as: bikeways, pedestrian walkways, enhanced transit usage, and increased Jobs/Housing Balance.

The document describes the following transit related mitigation measures: 12

- Landmark Village reserves 8 acres of land in a 35-foot wide strip along the south side of State Route-126 as a future rail corridor right of way.
- Construction of Park-and-Ride lot.
- Community design will include bus stop areas for future public bus services.

In the spirit of partnership, we look forward to continuing to work closely with the County and the project applicant regarding the transportation-related aspects of the project. If you have any questions regarding our comments and recommendations, you may call me at (213) 897-3747 or Elmer Alvarez, the IGR Coordinator, at (213) 897-6696, and refer to record number 060133/EA. 13

Sincerely,

CHERYL J. POWELL
IGR/CEQA Program Manager
Caltrans, District 7

cc: Scott Morgan, State Clearinghouse
Barry Witler, County of Los Angeles Department of Public Works

"Caltrans improves mobility across California"

A8. Letter from State of California, Department of Transportation, dated January 30, 2007

Response 1

The comment restates information contained in the Draft EIR, but does not raise an environmental issue within the meaning of CEQA. The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not raise an environmental issue regarding the content of the Draft EIR, no further response is required.

Response 2

This comment is an introduction to comments that follow. No further response is required.

Response 3

The project applicant agrees with this comment and has committed to the completion of the SR-126 mitigation measures identified in the project's Draft EIR prior to or concurrently with build-out of the project.

Response 4

The Commerce Center Drive/SR-126 interchange improvement project has completed the Caltrans project planning process using 20 year horizon forecasts as requested. The remaining SR-126 mitigation measures are within a PID (in the form of a Project Study Report (PSR)), which is based on 20-year forecasts as requested.

Response 5

The project applicant has committed to funding and building the indicated SR-126 improvements, including the resulting widening of SR-126 from I-5 to Long Canyon Bridge Road.

Response 6

The project applicant agrees that a Transportation/Traffic Mitigation Plan that details all Newhall Ranch project-related impacts and mitigation measures on SR-126 and I-5 would be beneficial and has prepared such a document in response to this comment. The Draft Newhall Ranch and Westside Communities State Highway Mitigation Summary has been submitted to Caltrans for its review and approval. This

report outlines and summarizes in a single comprehensive document the proposed mitigation measures to the State Highway System (I-5 and SR-126) associated with Newhall Land's projects

Response 7

The comment restates information contained in the Draft EIR, but does not raise an environmental issue within the meaning of CEQA. The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not raise an environmental issue regarding the content of the Draft EIR, no further response is required.

Response 8

The project applicant has reserved enough right-of-way for the potential future construction of a grade-separated interchange at SR-126 at Long Canyon Road. The project applicant acknowledges Caltrans decision to change the highway designation from conventional highway to expressway and will accommodate this decision in the final design of the project.

Response 9

A detailed listing of the forecast on-site trip interaction between the various residential and non-residential components of the Landmark Village project is provided in Appendix F (Tables 1, 3, and 5) of the project's traffic study (Draft EIR, Appendix 4.7). It is worth noting that the project will include a complete range of retail services for the residents, as well as a neighborhood school, transit improvements, trail improvements and employment opportunities, all of which reduce the amount of vehicle trips off site.

In addition, in connection with the Newhall Ranch Specific Plan environmental documentation, it was previously asserted that the internal capture rate of the Newhall Ranch Specific Plan appeared to be "overstated." The final environmental documentation (Final Newhall Ranch Specific Plan Program EIR, Volume III, November 24, 1997, pp. TR-34–36) included "Topical Response 7." In that response, the County provided supporting data for the EIR's forecast of the Specific Plan's internal capture of project-generated traffic. All such issues were considered and debated, and the County's Board of Supervisors elected to approve the Specific Plan and related project-approvals and to certify the Newhall Ranch Specific Plan Program EIR. Based upon that prior analysis, the County believes that the internal capture of project-generated traffic is supported by the Landmark Village Draft EIR and the previously certified Newhall Ranch environmental documentation.

Response 10

The project applicant agrees with this comment.

Response 11

The cumulative analysis contained within the Landmark Village Draft EIR (Section 4.7 – Traffic) is consistent with the analysis required by CEQA. The future expansion to I-5 with High Occupancy Vehicle (HOV) and Truck lanes is a programmed improvement and has been identified in various regional infrastructure studies. Additionally, contracts have been issued for the design and environmental review of this expansion and this work is presently underway. Therefore, it is reasonable to anticipate that this expansion will be in place by 2030.

Furthermore, and as indicated in the Draft EIR, Newhall Land has committed to fund Landmark's fair share to I-5 mainline improvements. This commitment will also apply to subsequent Newhall Ranch projects as well as the Entrada, Legacy, and Valencia Commerce Center projects. In summary, Newhall Land will be providing its fair share funding to mitigate its impacts to the I-5 mainline.

Response 12

The Landmark Village project incorporates all of the "smart growth" principles referenced in the comment. There are many different components that make a community sustainable or qualify it as a smart growth project. These include a proper mix of land use, provision of jobs, design for future transit uses in the plan, provision of open space and recreation, connectivity (trails), preservation of natural areas, the reduction of impermeable surfaces, water conservation and re-use, energy conservation, potentially including the use of alternative energies (wind, cogeneration, etc.), and the incorporation of green building techniques.

As is evidenced below, Landmark Village, as with all of Newhall Ranch, incorporates the components of a sustainable or smart growth community.

- **Mix of Land Uses.** Landmark Village, along with the other villages in Newhall Ranch, will include a broad range of housing types, including affordable housing, along with commercial, office, and public facilities. As to Landmark Village, a diverse range of 1,444 homes (308 single-family and 1,136 multi-family units) would be provided. To minimize and shorten vehicle trips, most homes will be within walking distances to the Landmark Village community's commercial and mixed-use areas, elementary school site, community park, and trail system. Finally, Landmark Village is located adjacent to the Valencia Commerce Center, one of the largest employment centers in the Santa Clarita Valley. Bike and pedestrian trails within Newhall Ranch and Landmark Village will connect to trails within the Valencia Commerce Center.

- **Provision of Jobs.** A portion of Newhall Ranch's projected 19,000 new jobs would be offered through Landmark Village's mixed-use and commercial areas. Newhall Ranch is adjacent to the existing Valencia Gateway (which includes the Valencia Commerce Center), which presently provides 50,000 jobs. Other development within Valencia Gateway will create an additional 30,000 jobs. When completed, the job centers in Newhall Ranch and Valencia will have resulted in the creation of approximately 100,000 jobs in the Santa Clarita Valley. A balanced jobs-housing base is a critical component to a sustainable community because it allows people to work close to home and minimizes vehicle miles traveled.

- **Locating of Residential Uses in Close Proximity to Commercial Services/Public Spaces.** Nearly 60 percent of the residential units in Newhall Ranch will be located within walking distance of village or commercial centers. This is clearly documented by the Landmark Village land plan. Residents within Landmark Village will be able to utilize paseos/trails and/or the Santa Clara River Regional Trail to walk to commercial centers, private recreational facilities, the elementary school and a community park. As stated above, this traditional neighborhood design minimizes vehicle trips.

- **Provision of Transit and Light Rail Right-of-Way.** Newhall Ranch, including Landmark Village, will be part of the Santa Clarita Transit system and will pay its fair share for transit service to the community. Transit improvements within Newhall Ranch will include a park-and-ride lot, a future transit station, transfer station, bus stops, and preservation of light rail right-of-way. Landmark Village will include a total of five bus stops, a park-and-ride lot, and the preservation of light rail right-of-way along SR-126. The provision of transit and the accommodation of light rail encourage residents to rely less on vehicular travel.

- **Open Space, Recreation, and Preservation of Sensitive Resource Areas.** Newhall Ranch, of which Landmark Village is a part, includes the preservation of the High Country, Salt Creek Corridor and the Santa Clara River and internal open areas – a total of nearly 7,800 acres. A total of three community parks (Landmark includes the first) and up to ten neighborhood parks will be provided as part of Newhall Ranch. Finally, private recreation facilities will be provided throughout the entire Ranch providing additional recreational opportunities to residents. In short, Landmark Village's design connects jobs, retail, schools, parks, and recreation facilities with the community's trail system to promote walking and biking while minimizing vehicle trips.

- **Hierarchy of Trails.** Newhall Ranch will include over 50 miles of trails to encourage pedestrian mobility. Landmark Village includes a two-mile extension of the Santa Clara River trail, with direct connections to residential, commercial, and park uses, and various paseos including the paseo running along "A" Street or the Landmark Village Spine Road. This design also is intended to minimize vehicle trips.

- **Reducing Impermeable Surfaces.** To curtail urban runoff and maximize groundwater recharge, Newhall Ranch, including Landmark Village, will utilize open/soft bottom channels, smaller street sections, where possible, increased native landscape areas, and non-structural water quality treatment improvements.

- **Water Conservation and Re-Use.** Newhall Ranch, including Landmark Village, will utilize native, drought-tolerant plants in the community's landscaping, use recycled water for irrigation, and evapotranspiration controllers (i.e., weather-sensitive sprinklers) to reduce potable water demand and runoff.

- **Traffic/Transportation Improvements.** Landmark Village's traffic circulation plan, which is consistent with all of Newhall Ranch, minimizes vehicle trips and reduces GHG emissions through the design of internal roads in conjunction with homes, school site, commercial areas, and trail system. Transit is included in the traditional neighborhood design, and it includes a park-and-ride lot and bus stops. Additionally, a five-mile right-of-way for a potential Metrolink light rail extension is accommodated along SR-126. Trails and bike paths leading to close-to-home jobs, neighborhood-serving retail, and the school encourage residents to reduce vehicle miles traveled. Finally, Newhall Land has committed to funding significant regional roadway improvements including improvements to SR-126 and I-5.

Response 13

The comment is noted. No further response is required given that the comment does not address or question the content of the Draft EIR.

Letter No. A9

CNV-3

State of California - The Resources Agency

ARNOLD SCHWARZENEGGER, *Governor*

DEPARTMENT OF FISH AND GAME

South Coast Region
4949 Viewridge Avenue
San Diego, CA 92123
(858) 467-4201

January 29, 2007

Mr. Daniel Fierros
Los Angeles Department of Regional Planning
Impact Analysis Section, Room 1348
320 West Temple Street
Los Angeles, CA 90012

Notice of Public Review Period Time Continuation to the
Draft Environmental Impact Report for
LANDMARK VILLAGE, County Project Number 00-196
State Clearinghouse Number 2004021002, Los Angeles County

Dear Mr. Fierros:

The Department of Fish and Game (Department) has received the Notice of Public Review Period Time Continuation for the Draft Environmental Impact Report for Landmark Village. The notice states " At this time the comment period will be extended up until the January 31, 2007 hearing date at which time the Regional Planning Commission (RPC) will be informed of these requests. The RPC will determine at the hearing to what date if the public review period will subsequently be extended." On January 8, 2007 the Department was granted, via e-mail, an extension of up to 30 days from the original comment period closing date of January 22, 2007 by the Los Angeles County Department of Regional Planning. In light of the above referenced notice, the Department is now requesting a 30-day extension beyond the January 31, 2007 comment period to allow staff to adequately review all pertinent materials on the project and compile comments. 1

The Department understands the applicant supports this requested time extension, and we will submit our comments on March 2, 2007. Questions regarding this letter and further coordination on these issues should be directed to Mr. Scott Harris, Associate Wildlife Biologist, at (626) 797-3170.

Thank you for your consideration in this matter.

Sincerely,

Larry L. Eng, Ph.D.
Regional Manager

cc: Department of Fish and Game:
Mr. Michael Mulligan, San Diego
Ms. Terri Dickerson, Laguna Niguel
Mr. John Mattox, Sacramento

A9. Letter from California Department of Fish and Game, dated January 29, 2007

Response 1

The comment requests a 30-day extension of time in which to submit comments on the Draft EIR. The additional time was provided. For additional information responsive to the comment, please refer to **Topical Response 3**: Public Review Opportunities. The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not raise an environmental issue, no further response is required.

Letter No. A10

STATE OF CALIFORNIA

Governor's Office of Planning and Research

State Clearinghouse and Planning Unit

Arnold Schwarzenegger
Governor

Cynthia Bryant
Director

February 1, 2007

Daniel Fierros
Los Angeles County Department of Regional Planning
320 West Temple Street
Los Angeles, CA 90012

ENV-25

Subject: The Landmark Village Project, Project No. 00-196, TR 53108/ CP00-196/ROAK-OT00-196/RCUP200500112
SCH#: 2004021002

Dear Daniel Fierros:

The State Clearinghouse submitted the above named Draft EIR to selected state agencies for review. The review period closed on January 31, 2007, and no state agencies submitted comments by that date. This letter acknowledges that you have complied with the State Clearinghouse review requirements for draft environmental documents, pursuant to the California Environmental Quality Act. 1

Please call the State Clearinghouse at (916) 445-0613 if you have any questions regarding the environmental review process. If you have a question about the above-named project, please refer to the ten-digit State Clearinghouse number when contacting this office. 2

Sincerely,

Terry Roberts

Terry Roberts
Director, State Clearinghouse

1400 TENTH STREET P.O. BOX 3044 SACRAMENTO, CALIFORNIA 95812-3044
TEL (916) 445-0613 FAX (916) 323-3018 www.opr.ca.gov

Document Details Report
State Clearinghouse Data Base

SCH# 2004021002
Project Title The Landmark Village Project, Project No. 00-196, TR 53108/
Lead Agency CP00-196/ROAK-OT00-196/RCUP200500112
Los Angeles County Department of Regional Planning

Type EIR Draft EIR

Description The project consists of 418 lots to include a maximum of 1,444 residential units, a maximum of 1,353,000 square feet of non-residential mixed-use, an elementary school, a community park, three private recreational facilities, open space, and river trail uses. The site is currently used for agricultural purposes and contains miscellaneous, ancillary sheds for agricultural storage and dirt roads. There is southern willow and cottonwood riparian habitat that extends to the central portion of the site along the southern boundary of the tract map. Three oak trees exist on site. Chiquita Canyon Landfill is located to the north of the project site. Several active and abandoned oil wells are located within the tract boundary. The project also includes all on-site and off-site infrastructures necessary to support the proposed project, including a domestic water system, sanitary sewer system, and a drainage network. Some off-site infrastructure improvements will be within SEA 23, Santa Clara River, containing habitat for the endangered stickleback. To protect the development from flood hazards, a bank stabilization system will be installed along portions of Santa Clara River. This project will require 4.2 million cubic yards of removal and recompaction of existing materials, and approximately 5.8 million cubic yards of import from the offsite adobe canyon barrow site. There are two water tanks north of Highway 126 that will service the project site. The EIR analyzes the construction of the Long Canyon Road Bridge across the Santa Clarita River.

Lead Agency Contact

Name Daniel Fierros
Agency Los Angeles County Department of Regional Planning
Phone (213) 974-6461 **Fax**
email
Address 320 West Temple Street
City Los Angeles **State** CA **Zip** 90012

Project Location

County Los Angeles
City Santa Clarita
Region
Cross Streets Chiquita Canyon Road, Commerce Center Drive, and Highway 126
Parcel No. 2826-001-003
Township **Range** **Section** **Base** SB

Proximity to:

Highways 126
Airports
Railways
Waterways Castaic Creek, Santa Clara
Schools
Land Use Agricultural / Specific Plan / Specific Plan

Project Issues Aesthetic/Visual; Agricultural Land; Air Quality; Archaeologic-Historic; Cumulative Effects; Drainage/Absorption; Flood Plain/Flooding; Forest Land/Fire Hazard; Geologic/Seismic; Growth Inducing; Landuse; Minerals; Noise; Other Issues; Population/Housing Balance; Public Services; Recreation/Parks; Schools/Universities; Sewer Capacity; Soil Erosion/Compaction/Grading; Solid Waste; Toxic/Hazardous; Traffic/Circulation; Vegetation; Water Quality; Water Supply; Wetland/Riparian; Wildlife; Economics/Jobs

Note: Blanks in data fields result from insufficient information provided by lead agency.

Document Details Report
State Clearinghouse Data Base

Reviewing Agencies	Resources Agency; Regional Water Quality Control Board, Region 4; Department of Parks and Recreation; Native American Heritage Commission; Integrated Waste Management Board; Office of Historic Preservation; Department of Health Services; Department of Fish and Game, Region 5; Department of Water Resources; Department of Conservation; California Highway Patrol; Caltrans, District 7; Department of Toxic Substances Control

Date Received 11/20/2006 ***Start of Review*** 11/20/2006 ***End of Review*** 01/31/2007

Note: Blanks in data fields result from insufficient information provided by lead agency.

A10. Letter from Governor's Office of Planning and Research, dated February 1, 2007

Response 1

The comment provides factual background information only and does not raise an environmental issue within the meaning of CEQA. The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not raise an environmental issue regarding the content of the Draft EIR, no further response is required.

Response 2

The comment is noted. No further response is required given that the comment does not address or question the content of the Draft EIR.

Letter No. A11

STATE OF CALIFORNIA

Governor's Office of Planning and Research

State Clearinghouse and Planning Unit

Arnold Schwarzenegger
Governor

Cynthia Bryant
Director

RECEIVED
FEB 12 2007

February 6, 2007

ENV-5

Daniel Fierros
Los Angeles County Department of Regional Planning
320 West Temple Street
Los Angeles, CA 90012

Subject: The Landmark Village Project, Project No. 00-196, TR 53108/ CP00-196/ROAK-OT00-196/RCUP200500112
SCH#: 2004021002

Dear Daniel Fierros:

The enclosed comment (s) on your Draft EIR was (were) received by the State Clearinghouse after the end of the state review period, which closed on January 31, 2007. We are forwarding these comments to you because they provide information or raise issues that should be addressed in your final environmental document.

The California Environmental Quality Act does not require Lead Agencies to respond to late comments. However, we encourage you to incorporate these additional comments into your final environmental document and to consider them prior to taking final action on the proposed project. 1

Please contact the State Clearinghouse at (916) 445-0613 if you have any questions concerning the environmental review process. If you have a question regarding the above-named project, please refer to the ten-digit State Clearinghouse number (2004021002) when contacting this office.

Sincerely,

Terry Roberts

Terry Roberts
Director, State Clearinghouse

Enclosures
cc: Resources Agency

1400 TENTH STREET P.O. BOX 3044 SACRAMENTO, CALIFORNIA 95812-3044
TEL (916) 445-0613 FAX (916) 323-3018 www.opr.ca.gov

A11. Letter from Governor's Office of Planning and Research, dated February 6, 2007

Response 1

The comment provides comment letters received by the State Clearinghouse. The comment also correctly points out that CEQA does not require lead agencies to respond to late comments; however, the State Clearinghouse encourages lead agencies to incorporate these additional comments into the final environmental documentation and to consider them prior to taking final action on the proposed project. The County concurs with the State Clearinghouse. Any comment letters received after the close of the public comment period will be incorporated into the Landmark Village Final EIR, and the comments will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not raise an environmental issue regarding the content of the Draft EIR, no further response is required.

Letter No. A12

STATE OF CALIFORNIA
Governor's Office of Planning and Research
State Clearinghouse and Planning Unit

Arnold Schwarzenegger
Governor

Cynthia Bryant
Director

Memorandum

ENV-24

Date: February 7, 2007
To: All Reviewing Agencies
From: Scott Morgan, Senior Planner
Re: SCH # 2004021002
The Landmark Village Project, Project No. 00-196, TR 53108/ CP00-196/ROAK-OT00-196/RCUP200500112

Pursuant to the attached letter, the Lead Agency has extended the review period for the above referenced project to February 20, 2007 to accommodate the review process. All other project information remains the same. 1

cc: Daniel Fierros
Los Angeles County Department of Regional Planning
320 West Temple Street
Los Angeles, CA 90012

1400 TENTH STREET P.O. BOX 3044 SACRAMENTO, CALIFORNIA 95812-3044
TEL (916) 445-0613 FAX (916) 323-3018 www.opr.ca.gov

Los Angeles County
Department of Regional Planning

Planning for the Challenges Ahead

Bruce W. McClendon, FAICP
Director of Planning

NOTICE OF PUBLIC REVIEW PERIOD TIME CONTINUATION
TO THE
COMPLETION AND AVAILABILITY
DRAFT ENVIRONMENTAL IMPACT REPORT

LANDMARK VILLAGE
County Project No. 00-196
Tentative Tract Map No. TR53108
RCUP-CP00-196/ROAK-OT00-196
RPA-SP00-196/ RPA-LP00-196
RCUP-T200500112/RHWY-HR00-196/RPA-PA00-196
STATE CLEARINGHOUSE NO. 2004021002

The Department of Regional Planning has been receiving several requests to extend the DEIR public review period. After opening the public hearing and taking testimony from the applicant and the public, the Regional Planning Commission continued the Landmark Village project (TR 53108) to February 28, 2007. The public comment period will be continued to February 20, 2007, to provide a full 90-day comment period on the Draft EIR. If you are unable to attend the February 28, 2007 hearing, please call the phone number below for further information.

To ensure public access to the DEIR, copies of the document will available for review at the County libraries listed below:

Newhall County Library
22704 West 9th Street
Newhall, CA 91321

Canyon County Jo Anne Darcy Library
18601 Soledad Canyon Road
Canyon Country, CA 91351-3721

Valencia County Library
223743 West Valencia Boulevard
Valencia, CA 91355

Copies of the DEIR will also be available for public review Monday through Thursday, 7:30 a.m. to 6:00 p.m. at: County of Los Angeles

Department of Regional Planning
Impact Analysis Section, Room 1348
320 West Temple Street
Los Angeles, CA 90012

Please submit written comments or direct any questions concerning this change or the DEIR to Mr. Daniel Fierros of the Department of Regional Planning at the above address or (213) 974-6461.

320 West Temple Street • Los Angeles, CA 90012 • 213-974-6411 • Fax: 213-626-0434 • TDD: 213-617-2292

Notice of Completion

Mail to: State Clearinghouse, P. O. Box 3044, Sacramento, CA 95812-3044 (916) 445-0613

Project Title *The Landmark Village Project (Project No. [illegible]) (R [illegible] CUP [illegible] OAK [illegible])*
Lead Agency: *L.A. County Department of Regional Planning* — Contact Person: *Doug Freier*
Street Address: *320 West Temple Street* — Phone: *(213) 974-6461*
City: *Los Angeles* CA Zip: *90012* — County: *Los Angeles*

Project Location
County: *Los Angeles* — City/Nearest Community: *Santa Clarita*
Cross Streets: *Chiquita Canyon Rd. Commerce Center Drive and Highway 126* — Total Acres: *291.2/250.9 Agency office*
Assessors Parcel No.: *2826-001-005* — Section: — Twp.: — Range: — Base: *San Bernardino*
Within 2 Miles: State Hwy #: *126* — Waterways: *Santa Clara River, Santa Clara*
Airports: *none* — Railways: *none* — Schools: *none*

RECEIVED
NOV 20 2006
STATE CLEARINGHOUSE

Document Type
CEQA: ☐ NOP ☐ Early Cons ☐ Neg Dec ☒ Draft EIR ☐ Supplement/Subsequent ☐ EIR (Prior SCH No.) ☐ Other
NEPA: ☐ NOI ☐ EA ☐ Draft EIS ☐ FONSI ☐ Other ☐ Joint Document ☐ Final Document ☐ Other

Local Action Type
☐ General Plan Update ☒ General Plan Amendment ☐ General Plan Element ☒ Local Plan Amendment
☒ Specific Plan Amendment ☐ Master Plan ☐ Planned Unit Development ☐ Site Plan
☐ Rezone ☐ Prezone ☒ Use Permit ☒ Land Division (Subdivision, Parcel Map, Tract Map, etc.)
☐ Annexation ☐ Redevelopment ☐ Coastal Permit ☒ Other *Oak Tree Permit*

Development Type
☒ Residential: Units *1444* Acres *[illegible]*
☐ Office: Sq.ft. — Acres — Employees
☒ Commercial: Sq.ft. *1.5 mil* Acres *39.5* Employees
☐ Industrial: Sq.ft. — Acres — Employees
☒ Educational: *Elementary School - 7.0 acres*
☒ Recreational: *Open Space 62.6 acres*
☒ Water Facilities: Type *Water Tanks* MGD
☐ Transportation: Type
☐ Mining: Mineral
☐ Power: Type — Watts
☐ Waste Treatment: Type
☐ Hazardous Waste: Type
☒ Other: *Ranch - 55.6 acres*

Project Issues Discussed In Document
☒ Aesthetic/Visual ☒ Agricultural Land ☒ Air Quality ☒ Archeological/Historical ☒ Coastal Zone ☒ Drainage/Absorption ☒ Economic/Jobs ☐ Fiscal
☒ Flood Plain/Flooding ☒ Forest Land/Fire Hazard ☒ Geologic/Seismic ☒ Minerals ☒ Noise ☒ Population/Housing Balance ☒ Public Services/Facilities ☒ Recreation/Parks
☒ Schools/Universities ☐ Septic Systems ☒ Sewer Capacity ☒ Soil Erosion/Compaction/Grading ☒ Solid Waste ☒ Toxic/Hazardous ☒ Traffic/Circulation ☒ Vegetation
☒ Water Quality ☒ Water Supply/Groundwater ☒ Wetland/Riparian ☒ Wildlife ☒ Growth Inducing ☒ Land Use ☒ Cumulative Effects ☒ Other

Present Land Use/Zoning/General Plan Use
Agricultural/Specific Plan/Specific Plan

Project Description
The attached DEIR has been prepared for the above project located within the Newhall Ranch Specific Plan in western unincorporated Los Angeles County, north of the Santa Clara River, south and north of Highway 126, east of Ventura County boundary, and west of Interstate 5 (I-5). The project consists of 418 lots to include a maximum of 1,444 residential units, a maximum of 1,385,000 square feet of non-residential mixed-used space, an elementary school, a community park, three private recreational facilities, open space and river trail uses. The site is currently used for agricultural purposes and contains miscellaneous ancillary sheds for agricultural storage and dirt roads. There is southern willow and cottonwood riparian habitat that extends to the central portion of the site along the southern boundary of the tract map. Three oak trees exist on site. Chiquita Canyon Landfill is located to the north of the project site. Several active and abandoned oil wells are located within the tract boundary. The project also includes all on-site and off-site infrastructures necessary to support the proposed project, including a domestic water system, sanitary sewer system, and a drainage network. Some off-site infrastructure improvements will be within SEA 23, Santa Clara River, containing habitat for the endangered steelhead. To protect the development from flood hazards, a bank stabilization system will be installed along portions of Santa Clara River. This Project will require 4.2 million cubic yards of removal and recompaction of existing materials, and approximately 8 million cubic yards of import from the offsite adobe canyon borrow site. There are two water tanks north of Highway 126 that will service the project site. The EIR analyzes the construction of the Long Canyon Road Bridge across the Santa Clarita River.

State Clearinghouse Contact: (916) 445-0613

State Review Began: 11-7-06

SCH COMPLIANCE: 2-1-07 / 1-31-2007

Please note State Clearinghouse Number (SCH#) on all Comments

SCH#: 2004021002

Please forward late comments directly to the Lead Agency

AQMD APCD: 33

(Resources: 11 29)

Project Sent to the following State Agencies

X Resources
Boating & Waterways
Coastal Comm.
Colorado Riv. Bd
X Conservation
X Fish & Game # 5
Delta Protection Comm
Forestry & Fire Prot
X Historic Preservation
X Parks & Rec
Reclamation Board
Bay Cons & Dev Comm
X DWR
OES (Emergency Serv)

Bus Transp Hous
Aeronautics
X CHP
Cultural
Urban Planning
Housing & Cmty Dev
Food & Agriculture
X Health Services

State/Consumer Svcs
General Services

Cal EPA
ARB - Airport Projects
ARB - Transportation Projects
ARB - Major Industrial Projects
X Integrated Waste Mgmt Bd
SWRCB: Clean Wtr Prog
SWRCB: Wtr Quality
SWRCB: Wtr Rights
X Reg. WQCB # 4
X Toxic Sub Ctrl-CTC

Yth/Adlt Corrections
Corrections

Independent Comm
Energy Commission
X NAHC
Public Utilities Comm
State Lands Comm
Tahoe Reg Plan Agency

Conservancy

Other

A12. Letter from Governor's Office of Planning and Research, dated February 7, 2007

Response 1

The comment provides factual background information only and does not raise an environmental issue within the meaning of CEQA. The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not raise an environmental issue regarding the content of the Draft EIR, no further response is required.

For additional information regarding the length of the public comment period, please refer to **Topical Response 3**: Public Review Opportunities.

Letter No. A13

State of California - The Resources Agency

ARNOLD SCHWARZENEGGER, *Governor*

DEPARTMENT OF FISH AND GAME
http://www.dfg.ca.gov
South Coast Region
4949 Viewridge Avenue
San Diego, CA 92123
(858) 467-4201

February 20, 2007

Mr. Daniel Fierros
Los Angeles Department of Regional Planning
Impact Analysis Section, Room 1348
320 West Temple Street
Los Angeles, CA 90012

Draft Environmental Impact Report for
LANDMARK VILLAGE, County Project Number 00-196
State Clearinghouse Number 2004021002, Los Angeles County

Dear Mr. Fierros:

The Department of Fish and Game (Department) has not yet completed its review of the Draft Environmental Impact Report (DEIR) for the Landmark Village project relative to impacts on biological resources. You may recall the Department previously requested an extension from the County to submit comments by March 2, 2007. Despite our best efforts, however, Department review of the DEIR is not yet complete and we are not in a position to forward comments today. 1

Consistent with our prior request, the Department will submit written comments to the County regarding the DEIR by no later than the close of business on March 2, 2007. We are sympathetic the delay may be an inconvenience to the County. Yet, we hope more comprehensive review of the DEIR will ultimately benefit the County, the public-at-large, and the fish and wildlife resources the Department holds in trust for the people of California.

Thank you again for the opportunity to provide comments regarding Landmark Village. Questions regarding this letter and further coordination on these issues should be directed to Ms. Betty Courtney in our Regional Office at (661) 263-8306. 2

Sincerely,

Larry L. Eng, Ph.D.
Regional Manager

cc: Mr. Larry Eng, San Diego
Mr. Michael Mulligan, San Diego
Ms. Terri Dickerson, Laguna Niguel
Ms. Betty Courtney, Newhall

bcc: Ms. Mary Meyer, Ojai

Mr. Scott Harris, Pasadena
Mr. Maurice Cardenas, Ojai

RM-Chron; HCP-Chron
Department of Fish and Game

Mr. Scott Morgan, Sacramento
State Clearinghouse

SPH:sph

sphernis\Landmark Village DEIR_02-07 doc

A13. Letter from California Department of Fish and Game, dated February 20, 2007

Response 1

The comment reiterates a prior request for an extension of time in which to comment on the adequacy of the Draft EIR. The additional time requested was provided. For additional information responsive to the comment, please refer to **Topical Response 3**: Public Review Opportunities.

Response 2

The comment is noted. No further response is required given that the comment does not address or question the content of the Draft EIR.

Letter No. A14

STATE OF CALIFORNIA
Governor's Office of Planning and Research
State Clearinghouse and Planning Unit

Arnold Schwarzenegger
Governor

Cynthia Bryant
Director

RECEIVED
MAR 05 2007
AH-12

February 21, 2007

Daniel Fierros
Los Angeles County Department of Regional Planning
320 West Temple Street
Los Angeles, CA 90012

Subject: The Landmark Village Project, Project No. 00-196, TR 53108/ CP00-196/ROAK-OT00-196/RCUP200500112
SCH#: 2004021002

Dear Daniel Fierros:

The State Clearinghouse submitted the above named Draft EIR to selected state agencies for review. The review period closed on February 20, 2007, and no state agencies submitted comments by that date. This letter acknowledges that you have complied with the State Clearinghouse review requirements for draft environmental documents, pursuant to the California Environmental Quality Act. 1

Please call the State Clearinghouse at (916) 445-0613 if you have any questions regarding the environmental review process. If you have a question about the above-named project, please refer to the ten-digit State Clearinghouse number when contacting this office.

Sincerely,

Terry Roberts

Terry Roberts
Director, State Clearinghouse

1400 TENTH STREET P.O. BOX 3044 SACRAMENTO, CALIFORNIA 95812-3044
TEL (916) 445-0613 FAX (916) 323-3018 www.opr.ca.gov

Document Details Report
State Clearinghouse Data Base

SCH# 2004021002
Project Title The Landmark Village Project, Project No. 00-196, TR 53108/
Lead Agency CP00-196/ROAK-OT00-196/RCUP200500112
Los Angeles County Department of Regional Planning

Type EIR Draft EIR

Description The project consists of 418 lots to include a maximum of 1,444 residential units, a maximum of 1,353,000 square feet of non-residential mixed-use, an elementary school, a community park, three private recreational facilities, open space, and river trail uses. The site is currently used for agricultural purposes and contains miscellaneous, ancillary sheds for agricultural storage and dirt roads. There is southern willow and cottonwood riparian habitat that extends to the central portion of the site along the southern boundary of the tract map. Three oak trees exist on site. Chiquita Canyon Landfill is located to the north of the project site. Several active and abandoned oil wells are located within the tract boundary. The project also includes all on-site and off-site infrastructures necessary to support the proposed project, including a domestic water system, sanitary sewer system, and a drainage network. Some off-site infrastructure improvements will be within SEA 23, Santa Clara River, containing habitat for the endangered stickleback. To protect the development from flood hazards, a bank stabilization system will be installed along portions of Santa Clara River. This project will require 4.2 million cubic yards of removal and recompaction of existing materials, and approximately 5.8 million cubic yards of import from the offsite adobe canyon barrow site. There are two water tanks north of Highway 126 that will service the project site. The EIR analyzes the construction of the Long Canyon Road Bridge across the Santa Clarita River.

Lead Agency Contact

Name Daniel Fierros
Agency Los Angeles County Department of Regional Planning
Phone (213) 974-6461 **Fax**
email
Address 320 West Temple Street
City Los Angeles **State** CA **Zip** 90012

Project Location

County Los Angeles
City Santa Clarita
Region
Cross Streets Chiquita Canyon Road, Commerce Center Drive, and Highway 126
Parcel No. 2826-001-003
Township **Range** **Section** **Base** SB

Proximity to:

Highways 126
Airports
Railways
Waterways Castaic Creek, Santa Clara
Schools
Land Use Agricultural / Specific Plan / Specific Plan

Project Issues Aesthetic/Visual; Agricultural Land; Air Quality; Archaeologic-Historic; Cumulative Effects; Drainage/Absorption; Flood Plain/Flooding; Forest Land/Fire Hazard; Geologic/Seismic; Growth Inducing; Landuse; Minerals; Noise; Other Issues; Population/Housing Balance; Public Services; Recreation/Parks; Schools/Universities; Sewer Capacity; Soil Erosion/Compaction/Grading; Solid Waste; Toxic/Hazardous; Traffic/Circulation; Vegetation; Water Quality; Water Supply; Wetland/Riparian; Wildlife; Economics/Jobs

Note: Blanks in data fields result from insufficient information provided by lead agency.

Document Details Report
State Clearinghouse Data Base

Reviewing Agencies	Resources Agency; Regional Water Quality Control Board, Region 4; Department of Parks and Recreation; Native American Heritage Commission; Integrated Waste Management Board; Office of Historic Preservation; Department of Health Services; Department of Fish and Game, Region 5; Department of Water Resources; Department of Conservation; California Highway Patrol; Caltrans, District 7; Department of Toxic Substances Control

Date Received 11/20/2006 ***Start of Review*** 11/20/2006 ***End of Review*** 02/20/2007

Note: Blanks in data fields result from insufficient information provided by lead agency.

A14. Letter from Governor's Office of Planning and Research, dated February 21, 2007

Response 1

The comment provides factual background information only and does not raise an environmental issue within the meaning of CEQA. The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not raise an environmental issue regarding the content of the Draft EIR, no further response is required.

Letter No. A15

STATE OF CALIFORNIA

Governor's Office of Planning and Research

State Clearinghouse and Planning Unit

Arnold Schwarzenegger
Governor

Cynthia Bryant
Director

February 26, 2007

Daniel Fierros
Los Angeles County Department of Regional Planning
320 West Temple Street
Los Angeles, CA 90012

Subject: The Landmark Village Project, Project No. 00-196, TR 53108/ CP00-196/ROAK-OT00-196/RCUP200500112
SCH#: 2004021002

Dear Daniel Fierros:

The enclosed comment (s) on your Draft EIR was (were) received by the State Clearinghouse after the end of the state review period, which closed on February 20, 2007. We are forwarding these comments to you because they provide information or raise issues that should be addressed in your final environmental document.

The California Environmental Quality Act does not require Lead Agencies to respond to late comments. However, we encourage you to incorporate these additional comments into your final environmental document and to consider them prior to taking final action on the proposed project. 1

Please contact the State Clearinghouse at (916) 445-0613 if you have any questions concerning the environmental review process. If you have a question regarding the above-named project, please refer to the ten-digit State Clearinghouse number (2004021002) when contacting this office.

Sincerely,

Terry Roberts
Director, State Clearinghouse

Enclosures
cc: Resources Agency

1400 TENTH STREET P.O. BOX 3044 SACRAMENTO, CALIFORNIA 95812-3044
TEL (916) 445-0613 FAX (916) 323-3018 www.opr.ca.gov

State of California - The Resources Agency

ARNOLD SCHWARZENEGGER, *Governor*

DEPARTMENT OF FISH AND GAME
http://www.dfg.ca.gov
South Coast Region
4949 Viewridge Avenue
San Diego, CA 92123
(858) 467-4201

February 20, 2007

RECEIVED
FEB 26 2007
STATE CLEARING HOUSE

Mr. Daniel Fierros
Los Angeles Department of Regional Planning
Impact Analysis Section, Room 1348
320 West Temple Street
Los Angeles, CA 90012

Clear 2-20-07 letter

Draft Environmental Impact Report for
LANDMARK VILLAGE, County Project Number 00-196
State Clearinghouse Number 2004021002, Los Angeles County

Dear Mr. Fierros:

The Department of Fish and Game (Department) has not yet completed its review of the Draft Environmental Impact Report (DEIR) for the Landmark Village project relative to impacts on biological resources. You may recall the Department previously requested an extension from the County to submit comments by March 2, 2007. Despite our best efforts, however, Department review of the DEIR is not yet complete and we are not in a position to forward comments today.

Consistent with our prior request, the Department will submit written comments to the County regarding the DEIR by no later than the close of business on March 2, 2007. We are sympathetic the delay may be an inconvenience to the County. Yet, we hope more comprehensive review of the DEIR will ultimately benefit the County, the public-at-large, and the fish and wildlife resources the Department holds in trust for the people of California.

Thank you again for the opportunity to provide comments regarding Landmark Village. Questions regarding this letter and further coordination on these issues should be directed to Ms. Betty Courtney in our Regional Office at (661) 263-8306.

Sincerely,

Larry L. Eng, Ph.D.
Regional Manager

cc: Mr. Larry Eng, San Diego
Mr. Michael Mulligan, San Diego
Ms. Terri Dickerson, Laguna Niguel
Ms. Betty Courtney, Newhall

bcc: Ms. Mary Meyer, Ojai

Mr. Scott Harris, Pasadena
Mr. Maurice Cardenas, Ojai

RM-Chron; HCP-Chron
Department of Fish and Game

Mr. Scott Morgan, Sacramento
State Clearinghouse

SPH:sph

spharris\Landmark Village DEIR_02-07.doc

A15. Letter from Governor's Office of Planning and Research, dated February 26, 2007

Response 1

The comment provides factual background information only and does not raise an environmental issue within the meaning of CEQA. The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not raise an environmental issue regarding the content of the Draft EIR, no further response is required.

Letter No. B1

RESOURCE MANAGEMENT AGENCY

county of ventura

Planning Division

Kim Rodriguez
Director

January 19, 2007

Daniel Fierros
Department of Regional Planning
Los Angeles County
320 W. Temple St.
Los Angeles, CA 90012

FAX #: 213.626.0434

Subject: Newhall Ranch Landmark Village Project (phase of total specific plan), County Project No. 00-196

Thank you for the opportunity to review and comment on the subject document. Attached are the comments that we have received resulting from intra-county review of the subject document.

Your proposed responses to these comments should be sent directly to the commenter, with a copy to Chuck Anthony, Ventura County Planning Division, L#1740, 800 S. Victoria Avenue, Ventura, CA 93009.

If you have any questions regarding any of the comments, please contact the appropriate respondent. Overall questions may be directed to Chuck Anthony at (805) 654-3683.

1

Sincerely,

Kim Rodriguez
County Planning Director

G:\Planning Division\Outside Environmental Documents\Response Letters\06-060 LA County Response Cover Letter

Attachment

County RMA Reference Number 06-060

800 South Victoria Avenue, L #1740, Ventura, CA 93009-1740 (805) 654-2481 FAX (805) 654-2509

PUBLIC WORKS AGENCY
TRANSPORTATION DEPARTMENT
Traffic, Advance Planning & Permits Division
MEMORANDUM

DATE: December 13, 2006

TO: Resource Management Agency, Planning Division
Attention: Carl Morehouse

FROM: Nazir Lalani, Deputy Director

SUBJECT: Review of Document 06-060
Newhall Ranch Landmark Village Project (Phase of Total Specific Plan).
The project is located in the northwest portion of the unincorporated area of the Los Angeles County within the Santa Clarita Valley Planning Corridor south of SR 126 near the intersection of Chiquito Canyon Road, north of Santa Clara River and west of I-5
Applicant: The Newhall Ranch and Farming Company
Lead Agency: **County of Los Angeles**

The Public Works Agency – Transportation Department has reviewed the DEIR for Newhall Ranch Landmark Village Project located in the unincorporated area of Los Angeles County within the Santa Clarita Valley Planning Corridor. The project proposes to construct 1,444 residential dwelling units, over 1,000,000 SF of mixed use/commercial uses, a nine-acre elementary School and a six-acre park/recreational facility.

2

The trip generation from this project is estimated to be 41,900 ADT. This project is only the first Phase of the Newhall Ranch Specific Plan. Page ES-96 of the DEIR states that the 2020 buildout of the entire Newhall Ranch Specific Plan would contribute to a potential significant impact at the intersection of Center Street and SR 126. The following measures are listed to mitigate the impacts on County Roadways and intersections:

Mitigation LV 4.7-23 listed on Page ES-111 of the DEIR identified no improvements at Main Street. The following improvements were identified at the intersection of SR 126 and Center Street.

1. Restripe Center Street Southbound approach resulting in right and left turn lanes.
2. Add a westbound right turn deceleration lane to SR 126 (Telegraph Road).
3. Install Traffic Signal when warranted.

3

Restriping Center Street resulting in right and left turn lanes appears to be in conflict with the improvements identified in the Piru Area Plan DEIR. The mitigation measure listed in the Piru Area Plan EIR is to construct a raised channeliser island to prohibit left turn movements from Center Street to SR 126.

The Transportation Department will require the applicant for the Newhall Ranch Project to contribute a pro rate share towards the cost of the improvement identified in the Piru Area Plan in addition to the mitigation measure measures identified in the DEIR for the Project.

4

The applicant shall contribute a project pro rata share for the following improvements at the intersection of SR 126 with Center Street and Main Street.

1. Improvements at SR 126 and Main Street as identified in the Piru Area Plan EIR for signal modifications with new signal phasing, mast arms, signal heads, westbound right-turn lane, eastbound left-turn lane, and lengthening the southbound left-turn lane at an estimated cost of $395,000. The project share at 9% (Page 4.7-92 reference 13) will amount to $35,550.

2. Improvements at SR 126 and Main Street as identified in the Piru Area Plan EIR for pedestrian crosswalk, pedestrian signal heads and pushbuttons, and wheelchair ramps at an estimated cost of $150,000. The project share at 9% will amount to $13,500. 5

3. Improvements at SR 126 and Center Street as identified in the subject EIR and the Piru Area Plan EIR for the construction of westbound right-turn deceleration lane on SR 126 is estimated at $100,000. The project share at 9% will amount to $9,000

4. Improvements at SR 126 and Center Street as identified in the Piru Area Plan EIR to construct a raised channelizer island at an estimated cost of $50,000. The project share at 9% will amount to $4,500.

The project pro rata shares to mitigate the impacts on SR 126 corridor will amount to $62,550. **Prior to the issuance of the first building permit** within the Newhall Ranch Specific Plan, the applicant shall enter into an agreement with the County of Ventura to deposit $62,550 in a Trust Fund towards these improvements. 6

In addition, **prior to the issuance of the first building permit** within the Newhall Ranch Specific Plan, the applicant shall post bond their pro rata share towards the cost of design and construction of a Traffic Signal at the intersection of SR 126 and Center Street. The estimated cost of construction of a Traffic Signal projected to 15 years is estimated to be $600,000. The Traffic Signal will be constructed when the intersection meets warrant. If the Traffic Signal does not meet warrant at the end buildout of the Newhall Ranch Specific Plan, the deposit will be returned to the applicant. 7

The cumulative impacts that result from the incremental impact of traffic generated by this project, when added to other closely related past, present, and reasonably foreseeable probable future projects, may be individually minor, but collectively significant over a period of time. The EIR should be revised to address the cumulative impact of this project on County local roads and the Regional Road Network. To mitigate the cumulative impact of traffic, the EIR should include a condition for payment of the Traffic Impact Mitigation Fee (TIMF). The fee is due **prior to the issuance of the first building permit for the project.** 8

Based on the fee schedule established in accordance with County Ordinance Code 8601-0 et seq. for the Piru area and the information provided in the DEIR, the TIMF due to the County is:

1000 ADT* x $14.99/ADT = **$14, 990** 9

* Newhall Ranch Traffic Analysis estimated that the Specific Plan would contribute 1000 ADT in the Piru area.

The above estimated fee may be subject to adjustment at the time of deposit, due to provisions in the Traffic Impact Mitigation Ordinance allowing the fee to be adjusted for inflation based on the Engineering News Record (ENR) construction cost index. The above is an estimate only based on information provided in the draft environmental document. If the project cumulative impacts are not mitigated by payment of a traffic mitigation fee, current General Plan policy will require County opposition to this project. 9

Our review is limited to the impacts this project may have on Ventura County's Regional Road Network. 10

Please call me at 654-2080 if you have questions.

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Ventura County
Watershed Protection District
Groundwater Section

MEMORANDUM

DATE: January 18, 2007

TO: Carl Morehouse, RMA - Planning Division

FROM: Theresa Stevens, WPD – Water & Environmental Resources Division

CC: Paul Callaway, WPD – Planning & Regulatory Division

SUBJECT: RMA 06-060, Draft EIR - Newhall Ranch Landmark Village

Project Description

The project consists of 418 lots to include a maximum of 1,444 residential units, a maximum of 1,353,000 square feet of non-residential mixed-used space, an elementary school, a community park, a fire station, three private recreational facilities, open space and river trail uses. The project proposes to develop the 292.6-acre Landmark Village tract map site located within the boundary of the Newhall Ranch Specific Plan in western Los Angeles County, north of the Santa Clara River, South and north of Highway 126, east of the Ventura County line and west of Interstate 5. The current land uses of the site are agricultural operations.

Additional off-site project-related components on 750.9-acres of land include the following.

A cut and fill grading operation, which includes fill imported to the tract map site from a 215-acre borrow site (Adobe Canyon borrow site), grading to accommodate roadway improvements to SR-126, and debris basins for stormwater flows collected by the tract map's storm drainage system on approximately 120-acres of land, located directly north of SR-126 within Chiquito Canyon (Chiquito Canyon grading site); 11

A 225.5-acre utility corridor, which would run parallel to SR-126, from the western boundary of the tract map site to the approved Newhall Ranch Wastewater Reclamation Plant (WRP) near the Los Angeles County/Ventura County line, from the eastern boundary of the tract map site to the Old Road/Interstate 5 (I-5), and then south to the existing Valencia WRP, which would extend municipal services to and from the tract map site.

Several portable water tanks, reclaimed water tanks, construction of the Long Canyon Road Bridge, bank stabilization and storm drainage improvements.

Comments

Section 4.3 Water Quality
Page 4.3-19 indicates "...Compliance with SUSMP requirements is used as one method to evaluate the significance of project development impacts". This statement is followed by a series of Best Management Practices (BMPs). The BMPs appear to be suggested options rather than requirements in the way they are written. For example, several of the BMPs indicate the applicant "must" or "needs" to implement a particular BMP rather than stating the applicant "shall" implement a BMP. Please revise the EIR to reflect that BMPs are required mitigation measures for water quality impacts. 12

Page 4.3-20 indicates that the 0.2 inch per hour intensity rainfall was used to calculate runoff and therefore designs for flow-based BMPs. Please clarify in the EIR the duration of this intensity of rainfall. 13

The hourly rainfall intensity for LA County was also used as the standard for calculating runoff. We recommend recalculation using the hourly rainfall intensity for the Santa Clara River watershed, and not just LA County or the LA County portion of this watershed. 14

Page 4.3-20 discusses hydro-modification. The EIR discusses protection of the Santa Clara River. Please revise the EIR and mitigation measures to require the applicant to detain all runoff generated by the development on site to pre-project conditions in order to protect the Santa Clara River and all tributaries thereto. 15

Page 4.3-29. Why does the flow date included in the analysis stop with 1969? Please revise the EIR to address this question. 16

Page 4.3-30(b) indicates there will be no discharge to tributaries in the post-development condition. If there will be no future discharge to these tributaries, this is permanent and potentially adverse change in their hydrologic condition and aquatic habitats Please revise the EIR to address these impacts and include additional mitigation measures if impacts are determined to be potentially significant. 17

Page 4.-3-50. The EIR indicates that "...Project related improvements to borrow sites would not result in introduction of impervious surfaces or any changes in drainage or hydrology characteristics. ." and that "...all water quality impacts will be limited to the construction phase". The mass grading associated with this project will result in sedimentation downstream of the graded area. While the EIR concludes that impacts would be limited to the construction phase, this conclusion is not supported in the EIR. Please revise the EIR and explain how graded areas will be stabilized and the timing of such stabilization work. Additional measures to stabilize the site should be added to the EIR as required mitigation measures. 18

Pages 4.3-56 and 4.3-57 describe several previously adopted hydro-modification control measures. The document also indicates that bank stabilization in the form of buried soil cement is proposed. This is hydro-modification and appears to be inconsistent with the adopted hydro-modification adopted measures described in the EIR and existing policy. Please revise the EIR and explain how a buried soil cement levee is consistent with adopted measures and the Los Angeles Regional Board's Hydro-modification policy (adopted on January 27, 2005). 19

The references to the length of the buried soil cement are not clear. The EIR identifies variously 18,600 linear feet and 17,400 linear feet "...plus additional...". Please revise the EIR to clearly explain the entire extent (length) of buried soil cement. 20

Please revise the EIR and explain the hydraulic effects of the Turf Reinforcement Mat. Is it hydraulically equivalent to rock slope protection of buried soil cement? 21

Table 4.3-12. Please revise the EIR so that "will" statements should be revised to "shall" to make these conditions required and enforceable. 22

23

Page 4.3-102. Will the buried soil cement be covered with soil and planted? 24 What is the temporary impact footprint for constructing this bank stabilization? 25 Will the temporary impacts extend into the river beyond the permanent impact footprint? If so, how far? 26 Please revise the EIR to answer these questions. Further, if the buried soil cement will be maintained by the Los Angeles County Public Works Department and/or re-planted by the applicant after high flows erode the soil and plants away, please revise the EIR and describe how cumulative impacts on the river as a result of such maintenance and/or re-planting will be avoided, minimized, and mitigated over the long term.

What other phases of the project and the larger Newhall land development include hydro-modification in the form of bank stabilization? Please revise the EIR and explain potential future hydro-modification in the cumulative impact analysis. Please add additional mitigation measures to address potentially significant future impacts associated with additional bank stabilization. 27

The statement that "...reset events buffer imperviousness..." oversimplifies the broader issue of the impact of urban development and increased impervious surfaces on water quality, biological resources, aesthetics, and sediment transport processes. What evidence is there to support this conclusion? Please revise the EIR to provide an example and a meaningful discussion of the cumulative impact of this development on the Santa Clara River and its tributaries so that the public and decisionmakers can make an informed decision on the project. 28

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VENTURA COUNTY
AIR POLLUTION CONTROL DISTRICT
Memorandum

TO: Chuck Anthony, Planning DATE: January 17, 2007

FROM: Alicia Stratton AS

SUBJECT: Request for Review of Draft Environmental Impact Report for Newhall Ranch Landmark Village Project (Phase of Total Specific Plan), County of Los Angeles (Reference No. 06-060)

Air Pollution Control District staff has reviewed the subject project, which is a proposal to develop the 292.6-acre Landmark Village tract map site, located in the first phase of the Riverwood Village within the boundary of the approved Newhall Ranch Specific Plan. The land uses proposed as part of the Landmark Village tract map site are consistent with the approved Specific Plan. Proposed development is for construction of 1,444 residential dwelling units (308 single family units, 1,136 multi-family units), 1,033,000 sq. ft. of mixed use/commercial uses, a nine-acre elementary school, a 16-acre community park, public and private recreational facilities, trails and road improvements. 29

Section 4.9 of the draft environmental impact report addresses air quality issues related to the project. We concur with the findings of the air quality discussion and recommend that all air quality mitigation measures described on Pages 4.9-68 through 4.9-82 be implemented as described. 30

If you have any questions, please call me at 645-1426. 31

Ventura County
Watershed Protection District
Groundwater Section

MEMORANDUM

DATE: January 17, 2007

TO: Chuck Anthony, RMA - Planning Division

FROM: David Panaro, WPD – Groundwater Section

SUBJECT: RMA 06-060, Draft EIR - Newhall Ranch Landmark Village

Project Description

The project consists of 418 lots to include a maximum of 1,444 residential units, a maximum of 1,353,000 square feet of non-residential mixed-used space, an elementary school, a community park, a fire station, three private recreational facilities, open space and river trail uses. The project proposes to develop the 292.6-acre Landmark Village tract map site located within the boundary of the Newhall Ranch Specific Plan in western Los Angeles County, north of the Santa Clara River, South and north of Highway 126, east of the Ventura County line and west of Interstate 5. The current land uses of the site are agricultural operations.

Additional off-site project-related components on 750.9-acres of land include the following:

A cut and fill grading operation, which includes fill imported to the tract map site from a 215-acre borrow site (Adobe Canyon borrow site), grading to accommodate roadway improvements to SR-126, and debris basins for stormwater flows collected by the tract map's storm drainage system on approximately 120-acres of land, located directly north of SR-126 within Chiquito Canyon (Chiquito Canyon grading site); 32

225.5-acre utility corridor, which would run parallel to SR-126, from the western boundary of the tract map site to the approved Newhall Ranch Wastewater Reclamation Plant (WRP) near the Los Angeles County/Ventura County line, from the eastern boundary of the tract map site to the Old Road/Interstate 5 (I-5), and then south to the existing Valencia WRP, which would extend municipal services to and from the tract map site;

Water tanks or storage reservoirs for potable and reclaimed water, construction of the Long Canyon Road Bridge, bank stabilization and storm drainage improvements are included in proposed plans.

Comments

The Landmark Village Draft EIR Section 4.3 – Water Quality states that cumulative impacts on groundwater quality from the proposed project and future urban development in the Santa Clara Watershed are addressed through compliance with the Municipal Separate Storm Sewer System Permit and Standard Urban Stormwater Mitigation Plan requirements, Construction General Permit requirements, General Dewatering Permit requirements, and benchmark Basin Plan groundwater quality objectives, which are intended to be protective of beneficial uses of the groundwater. Project compliance with the requirements designed to protect beneficial uses, cumulative groundwater quality impacts are mitigated to a level that is less than significant. 33

The groundwater recharge discussion contained within the water quality section of the DEIR summarizes that urbanization has been accompanied by long-tem stability in pumping and groundwater levels, plus the addition of State Water Project water to the Santa Clara River Valley. Together these factors have not reduced recharge to groundwater and not depleted the amount of groundwater that is in storage within the valley. Based on additional information provided within the groundwater recharge discussion, the cumulative impact on groundwater recharge is considered less than significant.

The Landmark Village Draft EIR Section 4.10 – Water Service reports no additional mitigation measures beyond those identified in the Newhall Ranch Specific Plan Program EIR are required or necessary, because the Landmark Village project does not result in any significant water-related impacts after implementation of the mitigation measures. The Landmark Village Draft EIR volumes on water supply assessment regarding groundwater management plans, state water project deliverability reports, etc. is an adequate review and a through account of water service for the proposed project. 33

The Landmark Village Draft EIR Section 4.11 – Wastewater Disposal mitigation measures requires that the project applicant implement the applicable mitigation measures from the Adopted Newhall Ranch Specific Plan as they relate to the Landmark Village project. Mitigation Measure Nos. 4.12-1 through 4.12.7 were adopted by Los Angeles County in connection with its approval of the Newhall Ranch Specific Plan. These applicable mitigation measures will be implemented, or have been implemented already, to mitigate the potentially significant wastewater disposal impacts associated with the proposed project.

Additional phases of this project will be examined at appropriate intervals. 34

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Office of
AGRICULTURAL COMMISSIONER
P.O. Box 889, Santa Paula, CA 93061
815 East Santa Barbara Street
Telephone: (805) 933-3165
(805) 647-5931
FAX: (805) 525-8922

Agricultural Commissioner
W. Earl McPhail

Chief Deputy
David Buettner

January 12, 2007

Daniel Fierros
Los Angeles County
Department of Regional Planning
320 West Temple Street
Los Angeles, CA 90012

Subject: Newhall Ranch, Landmark Village Project (RMA Ref # 06-060)

Dear Mr. Fierros:

Thank you for the opportunity to comment on the Initial Study and Draft EIR for the above project. The comment deadline is January 18, 2007.

The project description (abbreviated) is: Develop the 292.6-acre Landmark Village track map site, located in the first phase of the Riverwood Village within the boundary of the approved Newhall Ranch Specific Plan. Construction includes 1,444 residential dwellings, up to 1,033,000 sq ft of mixed-use/commercial uses, a 9-acre elementary school, a 16-acre Community park, a fire statement, public and private recreational facilities, trails, and road improvements, as well as related off-site support activities and construction, including construction of the Long Canyon Road Bridge, bank stabilization and storm drainage improvements. 35

With respect to the conversion of farmland, no part of the project is within Ventura County; and therefore, the Ventura County Agricultural Commissioner's Office has no comment on this topic. 36

With respect to conflicts with existing zoning for agriculture within Ventura County, the Newhall Ranch Specific Plan abuts farmland within Ventura County. However, no part of the Landmark Village tract map site (residential, school, or commercial uses) is within the development setback from the Los Angeles County/Ventura County line that was approved in the specific plan EIR. Storm drainage improvements for Landmark Village (debris basins) along the Santa Clara River appear to be within close proximity to Ventura County, but as they are considered non-human-intensive uses, they do not require extended setbacks from Ventura County farmland. 37

With respect to other changes in the existing environment which, due to their location or 38

nature, could result in the conversion of farmland downstream or downwind in Ventura County, the Ventura County Initial Study Assessment Guidelines (2000 Ed.), ("Initial Study Guidelines") state that any use that will decrease the quality of ground water available for agriculture to a level greater than 1200 mg/L total dissolved solids (TDS) is considered to have a significant impact. Any use that will cause a net decrease in the availability of water for agriculture is considered to have a significant project and cumulative impact. This includes uses that may increase the net utilization of ground water in an over drafted basin or in a basin in hydrologic continuity with a basin in over draft. 38 39

Further, the Initial Study Guidelines also provide that any project that will cause a 10 percent or greater increase in dust on agricultural parcels in Ventura County is considered to have a significant impact. The temporary construction of drainage improvements within one-half mile of farmland in Ventura County is likely to cause an increase in dust of over 10 percent, unless disturbed areas are watered and construction is halted during periods of high winds. 40

If you have any questions about these comments, please contact me at the telephone number or email address below. 41

Thank you.

Rita Graham
Agricultural Land Use Planner
(805) 933-8415
rita.graham@ventura.org

cc: Chuck Anthony, Ventura County Planning Division

— Serving Ventura County since 1895 —

B1. Letter from County of Ventura, Resource Management Agency, dated January 19, 2007

Response 1

This comment is an introduction to comments that follow. No further response is required.

Response 2

The comment restates information contained in the Draft EIR, but does not raise an environmental issue within the meaning of CEQA. The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not raise an environmental issue regarding the content of the Draft EIR, no further response is required.

Response 3

As noted in the comment, the project's Draft EIR has identified mitigation measure improvements at the SR-126/Center Street intersection. Similarly, the Final EIR for the Focused Piru Area Plan Update (FEIR) also has identified improvements for this intersection. While the specific improvements differ in some respects, the purpose and goal of the intersection improvements are consistent between the two documents. In other words, each document has identified the need for improvements at this intersection and each has identified a slightly different approach to providing for improvements. Since the Piru FEIR was a locally prepared document, the improvements identified there should take precedence. The project will commit to funding its fair share of the improvements for the SR-126/Center Street intersection, with the Piru FEIR improvements taking precedent when different from the improvements identified in the Draft EIR. Please note, however, that the Piru FEIR removed the reference to a raised island from the mitigation measure. The SR-126/Center Street intersection improvements, as stated in the FEIR, are currently as follows:

> **PIRU FEIR T-2**: To improve conditions at the intersection of SR-126 at Center Street, channelizers and extension striping shall be installed to prevent left-turns from Center Street to eastbound SR-126. This measure shall also include installation of additional signage directing eastbound traffic to use Main Street. This measure shall not be implemented until the intersection improvements at Main Street and Highway 126 (Measures T-3 and CC-2) have been completed.
>
> **PIRU FEIR T-8**: Provide a westbound right-turn deceleration lane from SR-126 to Center Street.

The Piru FEIR also states that traffic from the proposed Rancho Temescal project may require installation of a traffic signal at the Center Street/SR-126 intersection, and that the installation of that signal would be

the responsibility of the Rancho Temescal project, and that if the Rancho Temescal development is approved, the above FEIR T-2 mitigation measures may be unnecessary. The referenced FEIR T-3 mitigation measure consists of improvements at the Main Street/SR-126 intersection that include traffic signal modifications, left-turn storage capacity improvements, and the installation of a westbound right-turn deceleration lane. The referenced FEIR CC-2 mitigation measure consists of the funding of a detailed enhanced Main Street plan entryway to the community and a full funding commitment for construction and long-term maintenance of landscaped parkways and medians, the fair share cost of which shall be allocated based upon the percentage of linear street frontage along Main Street.

Response 4

As noted in **Response 3**, above, the project applicant will commit to funding the project's fair share of SR-126 improvements identified in the Piru FEIR as well as the non-conflicting SR-126 improvements identified in the project's Draft EIR. A complete listing of SR-126 improvements are summarized in **Response 5**, below, and the Newhall Ranch Specific Plan's share is 9 percent as noted on p. 4.7-92 of the Draft EIR. Because there is no nexus between the project and traffic conditions within the Piru community itself (i.e., roadways other than SR-126), the project will not be contributing to non-SR-126 improvements.

Response 5

Consistent with the mitigation measures described in the Newhall Ranch Specific Plan EIR, the project applicant agrees to contribute its fair share toward the indicated SR-126 improvements at Center Street and at Main Street. As footnoted on p. 4.7-92 of the Draft EIR, the indicated share amount of 9 percent represents the fair share of the entire Newhall Ranch Specific Plan area, of which the proposed project represents a portion. Payment of the amounts noted in the comment will fulfill the fair share obligation of the proposed project as well as the future individual projects that collectively comprise the entire Newhall Ranch Specific Plan area.

Regarding Item 4 (Improvements at SR-126 and Center Street as identified in the Piru Area Plan EIR), the Piru FEIR removed the reference to a "raised channelizer island" and instead states that "channelizers and extension striping" shall be installed to prevent left-turns. Therefore, Item 4 and the associated cost estimate should be changed as follows:

4. Improvements at SR-126 and Center Street as identified in the Piru Area Plan EIR to ~~construct a raised~~ channelizers and extension striping island at an estimated cost of ~~$50,000~~ $7,500. The project share at 9 percent will amount to ~~$4,500~~ $675.

Response 6

As noted in **Response 5**, above, payment based on a 9 percent fair-share amount will fulfill the fair-share obligation of the proposed project as well as the future individual projects that collectively comprise the entire Newhall Ranch Specific Plan area. Also, due to the FEIR mitigation measure that eliminated the construction of raised islands at the Center Street/SR-126 intersection, the amount of funds deposited into a Trust Fund for the County of Ventura should be adjusted downward to $58,725 to reflect the lower cost of channelizers and striping v. the construction of raised medians.

Response 7

The fair-share of the indicated amount that is attributable to the Newhall Ranch Specific Plan area is $54,000 (i.e., 9% of $600,000). As noted in **Response 5**, above, payment will fulfill the fair-share obligation of the proposed project as well as the future individual projects that collectively comprise the entire Newhall Ranch Specific Plan area.

Response 8

The traffic study prepared for the project's Draft EIR is based on forecasts of long-range cumulative conditions as requested in the comment. Furthermore, the traffic study prepared for the Newhall Ranch Specific Plan included the requested evaluation of cumulative impacts on County local roads and the Regional Road Network. This requested evaluation demonstrates that the Newhall Ranch Specific Plan does not result in cumulative significant impacts to roadways in Ventura County except where already addressed in the community of Piru and the City of Fillmore. Therefore, the Newhall Ranch Specific Plan is not required to participate in Ventura County's Traffic Impact Mitigation Fee (TIMF).

Response 9

As noted in **Response 8**, above, the Newhall Ranch Specific Plan does not result in cumulative impacts to roadways in Ventura County except where addressed in the community of Piru and the City of Fillmore. Therefore, the Newhall Ranch Specific Plan is not required to participate in Ventura County's TIMF.

Response 10

The comment is noted. No further response is required given that the comment does not address or question the content of the Draft EIR.

Response 11

The comment restates information contained in the Draft EIR, but does not raise an environmental issue within the meaning of CEQA. The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not raise an environmental issue regarding the content of the Draft EIR, no further response is required.

Response 12

Page 4.3-19 is within the Existing Conditions, Regulatory Setting subsection of the Landmark Village Draft EIR. This subsection describes the requirements of the MS4 Permit and Los Angeles County SUSMP Manual, not the BMPs being implemented by the project. The BMPs that will be implemented as Project Design Features (PDFs) in compliance with SUSMP requirements are described within Section 4.3 beginning on p. 4.3-49.

In summary, PDFs incorporated into the Landmark Village tract map project and off-site improvements to address surface water quality and hydromodification impacts include site design, source control, treatment control BMPs consistent with MS4 Permit and SUSMP requirements, as well as hydromodification control BMPs. Site design and source control BMPs are practices designed to minimize runoff and the introduction of pollutants into runoff. Treatment control BMPs are designed to remove pollutants once they have been mobilized by rainfall and runoff. Hydromodification control BMPs are designed to control increases in post-development runoff flows, volumes, and/or durations.

As currently planned, stormwater runoff from all urban areas within the project will be routed to bioretention areas, vegetated swales, and/or extended detention basin treatment control BMPs (see Figure 4.3-2, Project Design Features). Catch basin inserts will also be used in high-use parking lots. Collectively, the water quality treatment control PDFs will treat the pollutants of concern in runoff from the entire Landmark Village development area.

In addition, off-site areas will also drain to areas within the tract map site for treatment via swales, filter strips, and/or bioretention or will be treated locally. Long Canyon Bridge will drain to a water quality extended detention basin located within the tract map site. The off-site SR-126 expansion project will provide vegetated swale treatment for both the new and existing untreated roadway area. The utility corridor maintenance access road and potential future trail, as well as the water tanks and access roads, will drain to biofiltration treatment (vegetated swale or filter strip) or bioretention treatment. The extended detention basin, vegetated swales, and bioretention areas will be designed to operate off-line, receiving dry weather flows, small storm flows and the initial portion of large storm flows from a low-

flow diversion structure in the storm drain. Project-related improvements at the borrow sites would not result in the introduction of impervious surfaces or any changes in drainage or hydrology characteristics. Therefore, all water quality potential impacts of runoff discharges from the off-site areas are limited to the construction phase, and General Construction Permit requirements rather than SUSMP requirements will primarily govern implementation of construction phase BMPs to address those impacts. Finally, all of the above listed BMPs are project requirements.

Response 13

A rainfall intensity was not used to calculate runoff. The discussion on p. 4.3-20 relates to the sizing criteria options for BMPs provided in the 2002 Los Angeles County SUSMP as well as the 2001 Los Angeles County MS4 permit. These requirements state that flow-based BMPs, such as vegetated swales, must be designed to infiltrate or treat the maximum flow rate generated from one of the following scenarios:

1. The flow of runoff produced from a rain event equal to at least 0.2 inches per hour intensity, or
2. The flow of runoff produced from a rain event equal to at least two times the 85th percentile hourly rainfall intensity for Los Angeles County, or
3. The flow of runoff produced from a rain event that will result in treatment of the same portion of runoff as treated using volumetric standards above.

See **Response 14** below regarding method used to design and calculate proposed Landmark Village post-development BMPs.

Response 14

As stated in Appendix 4.3 of the *Landmark Village Water Quality Technical Report*, flow-based BMPs for the Landmark Village project will be sized using a rainfall intensity of 0.3 inches per hour, which will result in treatment of the same portion of runoff as treated using volumetric standards contained in the MS4 Permit. Use of this design rainfall intensity accounts for the higher rainfall intensities that occur in the project area in relation to other areas within Los Angeles County and allows for the collection and treatment of 80 percent of the average annual runoff volume, pursuant to guidance received from the Regional Water Quality Control Board.

Response 15

This comment focuses on hydromodification impacts resulting from increases in volume and duration of flow associated with development of impervious surface in connection with the project. A series of progressive hydromodification control measures will be used that are sufficient to prevent and control

hydromodification impacts to the Santa Clara River. As discussed in the Draft EIR Section 4.3 (Water Quality), volume reduction and hydromodification control measures will be incorporated into the project in accordance with the following design principles:

- Avoid, to the extent possible, the need to mitigate for hydromodification impacts in natural channels by preserving natural hydrologic conditions and protecting sensitive hydrologic features, sediment sources, and sensitive habitats.

- Minimize the hydromodification effects of development through site design practices (e.g., reducing connected impervious surfaces), implementation of stormwater volume-reducing and or combined treatment control and volume-reducing BMPs (project-based hydrologic source control), and incorporation of flow duration control into water quality treatment basins, as needed.

- Mitigate hydromodification impacts using geomorphically based channel design.

Several hydrologic source controls have already been included in the Newhall Ranch Specific Plan (NRSP) of which Landmark Village is a part. These include:

- Site design PDFs will help to reduce the increase in runoff volume. These site design PDFs include clustering of development into village areas, such as Landmark Village, which results in the preservation of 70 percent of the NRSP (including the Salt Creek Corridor dedication) area as open space; use of native and drought tolerant plants in landscaped areas; and the use of efficient irrigation systems in common area landscaped areas. The reduction in runoff volume attributable to the site design BMPs were not quantified in the runoff modeling, but these BMPs will further reduce the predicted increase in runoff volumes. These measures will help to protect the stability of the Santa Clara River and to avoid and minimize direct impacts.

- The project's treatment control BMPs will also serve as hydromodification source control BMPs. Vegetated swales, bioretention areas, and extended detention basins, sized per the standards established in the WQTR (capture and treatment of 80 percent of the average annual runoff volume) can provide volume reduction on the order of 20 to 30 percent through infiltration and evaporation. Collectively these vegetated treatment facilities are expected to provide significant reduction in wet weather runoff. In addition, these facilities will also receive and eliminate dry weather flows. Using conservative values for volume reduction, the treatment control PDFs are estimated to reduce the increase in average annual stormwater runoff volume associated with project development by approximately 19 percent, which likely understates the actual reductions since it doesn't account for volume reductions that will be provided by site design BMPs. Finally, volume reductions achieved by these BMPs will eliminate dry weather flows.

The reductions in post-development flow achieved by these BMPs, combined with localized energy dissipation structures at the storm drain outfalls will mitigate any project related hydromodification impacts to a less than significant level.

Balance Hydrologics assessed the potential effects of the planned cumulative urbanization within the Santa Clara River area, upstream of the County line (the upper watershed) on channel morphology by

examining historical changes in the Santa Clara River channel pattern in response to different types of major disturbance using historical rainfall and other relevant records and aerial channel photography (Balance Hydrologics, 2005 (provided in Appendix 4.3)). The findings of this analysis are summarized below.

The Santa Clara River is a dynamic, episodic system. Understanding the magnitude of geomorphic change over the course of recent history in response to natural and human disturbances in the watershed is a key factor in assessing the potential response to future urbanization, including development of Landmark Village, within the watershed.

Major perturbations within the Santa Clara River watershed (dam construction, levee construction, changes in flows in response to decadal-scale climatic patterns, and increase in woody vegetation) do not appear to have had a significant impact on the geomorphic expression of the Santa Clara River, as quantified from measurements made from a series of historical aerial photographs flown during the years 1927 through 2005.

Additional study of the Santa Clara River has been performed by Pacific Advanced Civil Engineering, Inc., who prepared a comprehensive fluvial analysis of the Santa Clara River through the NRSP area for the Los Angeles County Department of Public Works (LACDPW). This analysis is summarized within Section 4.2 of the Landmark Village Draft EIR and is contained in Appendix 4.2. A river fluvial analysis is the study of the riverbed and bank sediment movement over time and as a result of flow in the river and changes in the tributary watershed.

The fluvial analysis had three distinct components:

1. Analysis of long-term trends of riverbed and bank sediment build-up (aggredation) or removal (degradation) was performed. More than 80 years of available historic topographic mapping of the river indicated no real trend of aggredation or degradation in the study reach.
2. General (capital storm event) aggredation/degradation calculations were performed to determine the expected fluvial response of the river to the LACDPW design storm event (>140,000 cfs). US Army Corps of Engineers computer-modeling software (SAM) was used to evaluate existing and proposed project conditions. Only minor variations in the fluvial response were shown in the modeling.
3. Local aggredation/degradation resulting from river curvature, bridges, riverbed material, and various other components were considered and estimates of aggredation and degradation were calculated.

To complete the fluvial analysis, long term, general, and local aggredation/degradation components were added together to obtain the total aggredation/degradation for each river section within the study reach.

One of the purposes for the fluvial analysis, which has been approved by LACDPW, was to provide a level of understanding of the Santa Clara River reach fluvial mechanics related to existing conditions and proposed NRSP development conditions (including cumulative development), including increased volume of runoff and proposed bank stabilization, bridges and other physical alterations to the SCR, to identify any potential project impacts to the fluvial mechanics of the river. The fluvial analysis showed very little change in the pre- and post-development conditions and therefore concluded that there is no potential adverse impact to the fluvial mechanics of the river.

In conclusion, the project will include a number of hydrologic source control PDFs that will mitigate any project level hydromodification impacts to the Santa Clara River to a less than significant level. These measures, combined with flow controls that must be incorporated into other new development projects pursuant to the MS4 Permit, will mitigate any cumulative impacts to the Santa Clara River to a less than significant level.

Response 16

Flow data is available from the USGS gage near the Ventura/Los Angeles County Line for the period between 1953 and 1996. This entire period was included in the Draft EIR analysis (see Appendix F of Draft EIR Appendix 4.3)

Response 17

The vast majority of the Landmark Village tract map site drains directly to the Santa Clara River in both the existing condition and the proposed post-development condition and thus there will be no impacts to Castaic Creek, Long Canyon, or Chiquita Canyon. Further, off-site project-related components would not result in any changes in drainage or hydrology characteristics. Therefore, there will be no hydrologic condition or aquatic habitat impacts to these tributaries.

Response 18

As discussed in the Landmark Village Draft EIR, erosion and sediment control BMPs will be implemented during the construction phase in compliance with the Construction General Permit such that sediment will not be released downstream of the graded area, either during construction or after grading has been completed. See **Response 12**, above, for further detail.

Construction Mitigation Measure LV 4.2-5 (Draft EIR p. 4.2-59) requires that temporary erosion control measures shall be implemented to retain soil and sediment on the tract map site, within the Adobe

Canyon borrow site, the Chiquito Canyon grading site, the utility corridor right-of-way, and the bank stabilization areas, as follows:

- Re-vegetate exposed areas as quickly as possible;
- Minimize disturbed areas;
- Divert runoff from downstream drainages with earth dikes, temporary drains, slope drains, etc.;
- Reduce velocity through outlet protection, check dams, and slope roughening/terracing;
- Implement dust control measures, such as sand fences, watering, etc.;
- Stabilize all disturbed areas with blankets, reinforced channel liners, soil cement, fiber matrices, geotextiles, and/or other erosion resistant soil coverings or treatments;
- Stabilize construction entrances/exits with aggregate underdrain with filter cloth or other comparable method;
- Place sediment control BMPs at appropriate locations along the site perimeter and at all operational internal inlets to the storm drain system at all times during the rainy season (sediment control BMPs may include filtration devices and barriers, such as fiber rolls, silt fence, straw bale barriers, and gravel inlet filters, and/or with settling devices, such as sediment traps or basins); and/or
- Eliminate or reduce, to the extent feasible, non-stormwater discharges (e.g., pipe flushing, and fire hydrant flushing, over-watering during dust control, vehicle and equipment wash down) from the construction site through the use of appropriate sediment control BMPs.

Further, in areas not subject to mass grading, the smallest site disturbance area possible will be delineated and flagged; temporary storage of construction equipment will be restricted in these areas to minimize soil compaction on site. Site clearing and grading will be limited to allow development, access, and provide fire protection.

With respect to post-development erosion and sediment control, Mitigation Measures SP 4.2-5 and SP 4.2-7 require assurances that grading at the borrow sites will not result in erosion, sedimentation or flooding impacts during of *after* construction. Specifically, SP 4.2-5 requires preparation of a Hydrology Plan, Drainage Plan, and Grading Plan, including an Erosion Control Plan to ensure that no significant erosion, sedimentation or flooding impacts would occur during or after site development. These plans must be prepared to the satisfaction of the County of Los Angeles. Section 4.2 of the Landmark Village Draft EIR describes the post-development grades, configuration, benches and drainage patterns of the borrow sites, and indicates that permanent stabilization of borrow sites in the post-development condition shall be achieved by revegetation. See also **Response 8** above. In addition, mitigation measures SP 4.2-7 and LV 4.2-4 require preparation of a SWPPP and compliance with the General Construction NPDES Permit.

Pursuant to these requirements, construction phase erosion and sediment control BMPs described in the EIR and required pursuant to the General Construction NPDES Permit cannot be terminated at the site until and unless all soil disturbing activities are completed and either (1) a uniform vegetative cover with 70 percent coverage has been established, or (b) equivalent stabilization measures have been permanently employed. General Construction NPDES Permit Section A.7. These measures include the use and maintenance of BMPs such as blankets, reinforced channel liners, soil cement, fiber matrices, geotextiles or other erosion resistant soil coverings or treatments. Where background native vegetation covers less than 100 percent of the source, such as in arid areas, the 70 percent coverage criteria is adjusted such that if the native vegetation covers 50 percent of the ground surface 70 percent of 50 percent would require 35 percent total uniform surface coverage. Compliance with these regulatory requirements and the above identified mitigation measures will insure that post-development erosion, sedimentation or flooding impacts are controlled and are mitigated to a level that is less than significant.

Response 19

The hydromodification management approach for the Santa Clara River includes both previously adopted hydromodification control measures, including avoidance of physical alteration to the Santa Clara River, and very limited geomorphically referenced channel design measures, such as naturalized bank stabilization. In addition, the Landmark Village Draft EIR and WQTR describe new volume and flow control measures (hydrologic source control) to be implemented as project design features designed to assure an integrated and protective approach to controlling hydromodification in the Santa Clara River.

The project will incorporate the following hydrologic source control strategies:

- Site design PDFs that help to reduce the increase in runoff volume include the clustering of development into village areas, leaving large amounts of undeveloped open space within the NRSP subregion; routing of most roof runoff to vegetated areas; use of native and drought tolerate plants in landscaped areas; and the use of efficient irrigation systems in common area landscaped areas.

- The project's treatment control BMPs will also serve as hydromodification source control BMPs. Vegetated swales, bioretention areas, and extended detention basins can provide volume reduction on the order of 20 to 30 percent through infiltration and evaporation. Collectively these vegetated treatment facilities are expected to provide significant reduction in wet weather runoff. In addition, these facilities will also receive and eliminate dry weather flows.

- The project's development footprint will allow for the greatest freedom possible for "natural stream channel" activity. Generally, the buried bank stabilization has been located within the existing agricultural areas and away from the riparian corridor.

These measures generally constitute avoidance of impacts, and minimize the area of the SCR corridor that will be impacted by channel design and stability measures.

In addition to these project design features, the project will incorporate the following "geomorphically-referenced" channel design measures planned consistently with the principles described in SCCWRP Technical Report 450 (SCCWRP, 2005a):

- Energy Dissipation. Energy dissipation at storm drain outfalls provides erosion protection in areas where discharges have the potential to cause localized stream erosion. Erosion protection will be provided at all storm drain outlets to the Santa Clara River.

- Bank Stabilization. Most of the project's flood protection will include buried soil cement along Castaic Creek, Chiquito Creek, and the Santa Clara River (both adjacent to and downstream of the tract map site). In total, approximately 18,600 linear feet (LF) of bank would be provided with buried soil cement protection. This would include approximately 11,000 feet fronting the tract map site and approximately 6,400 LF on the south bank downstream (west) of the Long Canyon Road Bridge. Additional buried bank stabilization would be constructed upstream of the approved Newhall Ranch WRP and between The Old Road and the Santa Clara River to protect the utility corridor. The bank protection between The Old Road and the Santa Clara River was approved as part of the Santa Clara River Natural River Management Plan (NRMP).

As indicated above, the alignment for the majority of buried bank stabilization was selected so that bank protection along the river would generally be excavated from non-jurisdictional upland areas adjacent to the river that are presently being used for agricultural purposes. Areas previously utilized for agricultural purposes between the top of bank stabilization and the existing riparian corridor will then be planted with native vegetation, including those areas covering the buried soil cement. Installing most of the bank protection outside of the riparian corridor avoids impacts to the Santa Clara River, results in the widening of the riparian corridor in many areas and allows for channel movement and adjustment to changes in energy associated with runoff, and increases riparian habitat.

Consistently with Regional Board Policy, this approach incorporates site design and on-site measures to avoid and minimize hydromodification impacts to the SCR, which is a natural channel, and limits additional channel stabilization measures to those previously analyzed and approved for flood protection purposes. Further, this integrated approach assures that all channel design mitigation measures implemented are geomorphically referenced and preserve the natural channel appearance and natural river channel functions to the maximum extent practicable, while limiting instability in river channel morphology.

Response 20

The comment states that references to the length of the buried soil cement are unclear and that figures of 18,600 and 17,400 linear feet "plus additional" are used. The comment does not indicate in what sections of the EIR that this inconsistency appeared. A search of the Landmark Village Draft EIR Project Description, Hydrology, and Water Quality sections all consistently reference 18,600 linear feet of buried bank stabilization. The same consistent description is used for buried bank stabilization in each of those sections. In any case, the Landmark Village Draft EIR, Section 1.0, Project Description, provided a figure illustrating both the location and length of the buried soil cement within the Landmark Village project area, and offered the following explanation of the entire length of buried soil cement within that area:

> "The location of the protection was illustrated earlier on Figure 1.0-23. As shown, the proposed buried bank stabilization extends along the Santa Clara River and Castaic Creek adjacent to and downstream of the tract map site. In total, approximately 18,600 linear feet (LF) of bank would be provided with bank stabilization. This would include approximately 11,000 LF fronting the southern boundary of the tract map site on the north bank of the Santa Clara River, and approximately 6,400 LF on the south bank of the river, beginning at the Long Canyon Road Bridge and extending both east and west." (Draft EIR, Project Description, p. 1.0-53.)

In the Landmark Village Draft EIR, Section 4.4, Biota, p. 4.4-53, there is one incorrect reference to 17,400 linear feet of buried soil cement within the Landmark Village project area. This reference has been corrected in a revised version of **Section 4.4, Biota**. The revised section is intended to replace the version found in the Landmark Village Draft EIR. Please refer to the Final EIR **Section 3.0, Revised Draft EIR Pages**, for the revisions.

Response 21

As described in Section 4.2, Hydrology, turf reinforcement mats (TRMs) are one type of reinforced bio-engineered bank stabilization material. TRMs are a geotextile reinforced, bio-engineered bank stabilization method designed to reinforce vegetation at the root and stem, thereby allowing vegetation to be used as erosion control in areas where lower, non-erosive velocities are present in the County's capital storm. TRMs and other geotextiles are suitable for locations with high slopes or stream banks where grouted riprap and concrete channels are hydraulically unnecessary and hardened bank protection is aesthetically undesirable. TRMs are secured to the soil surface using a predetermined staple pattern and either wire soil staples or biodegradable stakes. TRM products proposed for use are constructed of two basic materials that perform different functions: (1) permanent netting designed to provide permanent structure and strength to the vegetation at the root and stem level; and (2) degradable natural and synthetic fiber netting that provides erosion control immediately after installation by holding seed and

soil particles in place and trapping moisture on the soil surface. TRM products are expected to provide sufficient erosion control, vegetation establishment, and reinforcement at the locations where they are proposed and will not result in any significant hydrological impacts. Finally, TRMs can only be utilized in locations where lower velocities are present in the capital storm and therefore are not the equivalent to rock slope protection or buried soil cement.

Response 22

The comment requests that the word "will" be changed to "shall" in Table 4.3-12 to make these conditions required and enforceable. The use of the word "will" is a "commitment" verb, which is enforceable. Typically, the words "should" or "may" are the catch words that one should avoid when preparing mitigation measures for a project. Consequently, no changes to the table are required.

Response 23

The comment requested clarification if buried soil cement is covered with soil and planted. The Landmark Village Draft EIR, Section 1.0, Project Description, p. 1.0-54, states: "…the soil placed on top of the bank stabilization is replanted with native vegetation to return the disturbed area to its natural condition upon completion of construction."

Response 24

The comment questioned the temporary impact footprint associated with bank stabilization. The Landmark Village Draft EIR, Section 4.4, Biota, p. 4.4-56, Table 4.4-8, Plant Community/Land Use Impact Summary, states that "55.74 acres [would be] temporarily disturbed by bank stabilization, utility corridor, and/or haul roads, but would be revegetated to native vegetation following completion of construction."

Response 25

The comment questioned how far temporary impacts would extend into the river beyond the permanent impact footprint. Temporary impacts within the Santa Clara River SMA/SEA 23 total 64.98 acres. It should be noted that these areas will be restored and enhanced in conjunction with the project.

Response 26

Most of the restoration areas, including those covering the buried soil cement, associated with Landmark Village are located outside of the existing riparian corridor and are presently being utilized for agricultural purposes. These restoration areas will be planted with native vegetation. It is unlikely that riparian mitigation in these areas would be impacted by storm events. Please see **Response 2**, above, and **Response 10**, below, which further support this finding.

To illustrate the point, **Figure B-1, Existing Buried Soil Cement Bank Protection along Santa Clara River at the Bridgeport Project**, shows an overview of existing buried bank protection along the Santa Clara River for the Bridgeport project site. The figure shows the buried bank protection planted with native vegetation. **Figure B-2, Buried Soil Cement at Bridgeport after 2004/05 Storms**, and **Figure B-3, Aerial Photography of Still-Buried Soil Cement Bank Protection on San Francisquito Creek at Copper Hill Road Following the 2004/2005 Winter High Flow Events**, of this response present aerial views of the 2004/2005 storm flows on San Francisquito Creek near Copper Hill Road. The photos show that despite the 2004/2005 winter rainy season, which proved to be one of the wettest years on record and produced an approximate 50-year flood in the Santa Clara River, storm flows did not expose any of the buried soil cement bank protection and no damaged occurred to the revegetated areas at the Bridgeport project site.

Figure B-1, Existing Buried Soil Cement Bank Protection along Santa Clara River at the Bridgeport Project

Figure B-2, Buried Soil Cement at Bridgeport after 2004/05 Storms

Figure B-3, Aerial Photography of Still-Buried Soil Cement Bank Protection on San Francisquito Creek at Copper Hill Road Following the 2004/2005 Winter High Flow Events

Furthermore, Dudek prepared a watershed study (Dudek 2007) to analyze the cumulative impacts of development, including past projects, current land use zoning, and future and approved projects in the Los Angeles County portion of the watershed, on biological and abiotic resources, ecological functions, and processes in the watershed. While land conversion, in the form of agriculture, residential, commercial, and industrial urban uses has occurred in the Santa Clara River Valley and adjacent foothills and future development will occur, the vast majority of the watershed is comprised of natural lands. The additional impacts of the Landmark Village project, Newhall Land and Farming projects in general, and other planned and approved projects in the Los Angeles County portion of the watershed are relatively small in proportion to the overall watershed. Key findings of the Dudek watershed study include:

The watershed is, and will remain, for the most part undeveloped – lands converted to agriculture and urban development comprise about 10 percent of the total watershed. Planned and approved projects in Los Angeles County (including the City of Santa Clarita) would increase the amount of development in the watershed by about 3 percent.

The watershed has very substantial existing public lands and planned open spaces that will be protected in perpetuity. Based on current public lands and currently zoned open space, approximately 71 percent of the watershed (733,526 acres) is existing or zoned open space.

Under current land use zoning important biological and physical features of the overall watershed would be retained. The major vegetation communities (coastal scrubs, chaparral, non-native grassland, woodlands and forest, and riparian/wetlands) are still and will remain relatively common in the watershed.

Newhall lands are a very small proportion (<2%) of the overall watershed and are limited to a small area in the southern portion of the watershed. Planned development on Newhall lands (including the Landmark Village project) would impact only 1 percent of the total watershed and would be 26 percent less than the amount of development allowed on Newhall lands under the current land use zoning.

Planned development on Newhall lands is downstream of substantial existing, planned, and approved urban land uses in Santa Clarita and Valencia and occurs in the lower elevation areas of the watershed, thus protecting headwaters and upper portions of sub-basins within the watershed and the functions and values these sub-basins provide.

Regional wildlife corridors and habitat linkages will be preserved in the watershed.

Response 27

Please see **Response 9**, above.

Response 28

Pacific Advanced Civil Engineering, Inc. (PACE), assessed the potential effects of the planned cumulative urbanization, including Newhall Ranch, within the Santa Clara River upstream of the County line (the upper watershed) on channel morphology with a comprehensive fluvial analysis for the Santa Clara River. A river fluvial analysis is the study of the riverbed and bank sediment movement over time and as a result of flow in the river and changes in the tributary watershed. Balance Hydrologics assessed the potential effects of the planned cumulative urbanization within the Santa Clara River upstream of the County line (the upper watershed) on channel morphology by examining historical changes in the Santa Clara River channel pattern in response to different types of major disturbance using historical rainfall and historical aerial channel photography (Balance Hydrologics, 2005 [provided in Appendix F to Draft EIR Appendix 4.3]). The findings of these analyses are summarized in **Response 15** above. Also, see **Response 17** above regarding impacts on tributaries to the Santa Clara River. These extensive analyses indicate that the integrated approach to hydromodification control proposed by the project will avoid, minimize, and mitigate hydromodification impacts in the SCR to a level that is less than significant.

Response 29

The comment restates information contained in the Draft EIR, but does not raise an environmental issue within the meaning of CEQA. The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not raise an environmental issue regarding the content of the Draft EIR, no further response is required.

Response 30

The comment concurs with the Landmark Village Draft EIR's findings in Section 4.9, Air Quality, concerning the air quality discussion and mitigation measures. The comment also recommends that all air quality mitigation measures be implemented as described. In response, the applicant already has committed to implementing both the applicable mitigation measures from the Newhall Ranch Specific Plan as described and revised (see, pp. 4.9-67–4.9-81 [Mitigation Measures SP 4.10-1–SP 4.10-14]) and the mitigation measures recommended for the proposed Landmark Village project (see pp. 4.9-81–4.9-85 [Mitigation Measures LV 4.9-1–LV 4.9-8]).

Response 31

The comment is noted. No further response is required given that the comment does not address or question the content of the Draft EIR.

Response 32

The comment restates information contained in the Draft EIR, but does not raise an environmental issue within the meaning of CEQA. The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not raise an environmental issue regarding the content of the Draft EIR, no further response is required.

Response 33

The comment concurs with the Landmark Village Draft EIR's discussion of cumulative impacts on groundwater quality from the proposed project and future urban development in the Santa Clara watershed. The comment also concurs with the Draft EIR's discussion of groundwater recharge, and as to the EIR's water service section, the comment states that the Draft EIR's water supply assessment regarding groundwater management plans, SWP delivery reports, etc., "is an adequate review and a thorough account of water service for the proposed project." In addition, the comment concurs with the Draft EIR's discussion of wastewater impacts and mitigation. No further response is required, except that the comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project.

Response 34

The comment is noted. No further response is required given that the comment does not address or question the content of the Draft EIR.

Response 35

The comment restates information contained in the Draft EIR, but does not raise an environmental issue within the meaning of CEQA. The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not raise an environmental issue regarding the content of the Draft EIR, no further response is required.

Response 36

The comment states that because no part of the project is within Ventura County, the Ventura County Agriculture Commissioner's Office has no comment on the conversion of farmland in Los Angeles County. No further response is required, except that the comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project.

Response 37

The comment addresses potential conflicts with existing zoning for agriculture within Ventura County and the Newhall Ranch Specific Plan. The comment correctly states that no part of the Landmark Village tract map site is within the development setback from the Los Angeles County/Ventura County line that was approved in the Newhall Ranch Specific Plan Program EIR. As to storm drainage improvements for Landmark Village (debris basins) along the Santa Clara River, the comment states that they appear to be within close proximity to Ventura County, "but as they are considered non-human-intensive uses, they do not require extended setbacks from Ventura County farmland." The County concurs with this comment.

Response 38

Landmark Village Draft EIR Section 4.3 and Appendix 4.3 Section 7.8 analyzed the Landmark Village project's potential for impacts to groundwater quality and quantity. The pollutants of concern for the groundwater quality analysis are those that are anticipated or potentially could be generated by the project at concentrations, based on water quality data collected in Los Angeles County from land uses that are the same as those included in the project, that exhibit these characteristics. Identification of the pollutants of concern for the project considered the proposed land uses and the pollutants generally associated with those types of land uses, as well as the pollutants that have the potential to impair beneficial uses of groundwater.

In general, elevated mineral concentrations, such as chloride or total dissolved solids, could impact certain beneficial uses such as agricultural supply; however, these minerals and total dissolved solids associated with Newhall Ranch (including Landmark Village) will be below Basin Plan groundwater objectives.

The mean concentrations of total dissolved solids in urban runoff, which are representative of concentrations that could be expected in project runoff in the post-development condition, as measured by LACDPW ranged from 53 mg/L to 237 mg/L, depending on land use. Even the highest concentration of 237 mg/L is well below the 1200 mg/L total dissolved solids set forth as a threshold of concern in the

Initial Study Guidelines and is well below the Los Angeles Basin Plan Groundwater Quality Objective for TDS of 1,000 mg/L. The anticipated average concentration of TDS in effluent from the Newhall Ranch WRP is 790 mg/L (CH2M Hill, 2006), which is also well below the Initial Study Guidelines threshold and Basin Plan objective. Thus, the project's impact on TDS concentrations is considered insignificant. Therefore, no potential adverse affects on TDS levels in groundwater are expected as a result of Landmark Village.

To ascertain project development impacts on groundwater recharge, the reductions in recharge that will result from development of impervious surface must be balanced against the increased recharge that will result from increased irrigation and stormwater flows associated with development of urban uses. Irrigation will be applied on site and can be expected to percolate into groundwater on the project site. In addition, hydromodification controls will allow for percolation of some increases in stormwater runoff into groundwater on site, while some increase in stormwater runoff volume will be discharged to the Santa Clara River after treatment. The active channel of the River is predominantly natural, and consists of vegetation and coarse-grained sediments. The porous nature of project site soils in areas where volume reduction BMPs are planned, combined with the sands and gravels forming the active channel of the Santa Clara River will allow for significant infiltration to occur to the underlying groundwater. Also, irrigation water is predicted to be fully infiltrated during dry weather, which will result in groundwater recharge from the project. On this basis, the project will not significantly impact groundwater recharge.

This conclusion is consistent with the study of cumulative affects on groundwater recharge associated with urban development in the area. The hydrologic effects of the project on groundwater were examined in Draft EIR Section 4.3 and Appendix 4.3. WQTR Appendix E contains a memorandum prepared by CH2M Hill entitled "Effect of Urbanization on Aquifer Recharge in the Santa Clarita Valley" which discusses the general effects of urbanization on groundwater recharge and the specific effects in the Santa Clarita Valley. This analysis confirms that urban development has not substantially reduced groundwater recharge as the vast majority of recharge occurs within the Santa Clara River and its larger tributaries. On this basis, the Draft EIR concludes that potential adverse impacts to groundwater recharge are less than significant.

Response 39

As to comments about increasing net utilization of groundwater in an overdrafted basin or in a basin in hydrologic continuity with a basin in overdraft, please refer to the Landmark Village Draft EIR, Section 4.10, Water Service, at pp. 4.10-28-29 and 4.10-32-33. In that discussion, the EIR provides an assessment of the "sustainability" of both the Alluvial aquifer and the Saugus Formation, and that assessment concludes, based on substantial evidence (see, e.g., Draft EIR, Appendix 4.10 [2005 Basin Yield Report]),

that the local Santa Clara River Valley groundwater basin in Los Angeles County is not in an overdraft condition. The previously certified Newhall Ranch Specific Plan Program EIR also established that this local basin is not hydrologically connected to another basin in an overdraft condition.

Response 40

The comment states that County of Ventura Initial Study Guidelines conclude that any project that will cause a 10 percent or greater increase in dust on agricultural parcels in Ventura County is considered to have a significant impact. The comment concludes that the temporary construction of drainage improvements within one-half mile of farmland in Ventura County is likely to cause an increase in dust over 10 percent, unless disturbed areas are watered and construction halted during periods of high winds. As shown below, the Newhall Ranch Specific Plan, including the Landmark Village project, already contains adopted and enforceable mitigation measures requiring that active grading sites be watered at least twice daily and that unpaved parking or staging areas or unpaved roads be watered three times daily—all to reduce dust concerns; in addition, the measures require suspension of all excavating and grading operations when wind speeds exceed 25 miles per hour. Thus, as shown below, the mitigation measures are consistent with the comments made by Ventura County.

For example, Mitigation Measure SP 4.10-6 describes all of the adopted measures to reduce fugitive dust impacts:

"SP 4.10-6 The applicant of future subdivisions shall implement all rules and regulations adopted by the Governing Board of the SCAQMD which are applicable to the development of the subdivision (such as Rule 402 – Nuisance, Rule 403 – Fugitive Dust, Rule 1113 – Architectural Coatings) and which are in effect at the time of development. The purpose of Rule 403 is to reduce the amount of particulate matter entrained in the ambient air as a result of man-made fugitive dust sources by requiring actions to prevent, reduce, or mitigate fugitive dust emissions. Rule 403 applies to any activity or man-made condition capable of generating fugitive dust such as the mass and remedial grading associated with the project as well as weed abatement and stockpiling of construction materials (i.e., rock, earth, gravel). Rule 403 requires that grading operations either (1) take actions specified in Tables 1 and 2 of the Rule for each applicable source of fugitive dust and take certain notification and record keeping actions, or (2) obtain an approved Fugitive Dust Control Plan. A complete copy of the SCAQMD's Rule 403 Implementation Handbook, which has been included in Appendix 4.10, provides guideline tables to demonstrate the typical mitigation program and record keeping required for grading operations (Tables 1 and 2 and sample record-keeping chart). The record keeping is accomplished by on-site construction personnel, typically the construction superintendent.

Each future subdivision proposed in association with the Newhall Ranch Specific Plan shall implement the following if found applicable and feasible for that subdivision:

Grading

a. Apply non-toxic soil stabilizers according to manufacturers' specification to all inactive construction areas (previously graded areas inactive for 10 days or more).

b. Replace groundcover in disturbed areas as quickly as possible.

c. Enclose, cover, water twice daily, or apply non-toxic soil binders according to manufacturers' specifications, to exposed piles (i.e., gravel, sand, dirt) with 5 percent or greater silt content.

d. Water active sites at least twice daily.

e. Suspend all excavating and grading operations when wind speeds (as instantaneous gusts) exceed 25 miles per hour.

f. Monitor for particulate emissions according to district-specified procedures.

g. All trucks hauling dirt, sand, soil, or other loose materials are to be covered or should maintain at least 2 feet of freeboard (i.e., minimum vertical distance between top of the load and the top of the trailer) in accordance with the requirements of CVC Section 23114.

Paved Roads

h. Sweep paved streets at the end of the day if visible soil material is carried onto adjacent public paved roads (recommend water sweepers with reclaimed water).

i. Install wheel washers where vehicles enter and exit unpaved roads onto paved roads, or wash off trucks and any equipment leaving the site each trip.

Unpaved Roads

j. Apply water three times daily, or non-toxic soil stabilizers according to manufacturers' specifications, to all unpaved parking or staging areas or unpaved road surfaces.

k. Reduce traffic speeds on all unpaved roads to 15 miles per hour or less.

l. Pave construction roads that have a traffic volume of more than 50 daily trips by construction equipment, 150 total daily trips for all vehicles.

m. Pave all construction access roads at least 100 feet on to the site from the main road.

n. Pave construction roads that have a daily traffic volume of less than 50 vehicular trips.

These measures control PM_{10} emissions and would also control $PM_{2.5}$ emissions. The effectiveness of these measures at reducing PM_{10} emissions ranges from 7 to 92.5 percent.[1] For the purposes of this impact analysis, and to be consistent with URBEMIS2002 methodology, it is assumed that implementation of these measures would reduce $PM_{2.5}$ and PM_{10} emissions by a maximum of 50 percent."

Response 41

The comment is noted. No further response is required given that the comment does not address or question the content of the Draft EIR.

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1 SCAQMD, *CEQA Air Quality Handbook* (Diamond Bar, California: SCAQMD, November 1993), p. 11-15, and p. A11-77, which is available for public inspection and review at Impact Sciences, Inc., 803 Camarillo Springs Road, Suite A-1, Camarillo, California 93012, and is incorporated by this reference.

Letter No. B2

COUNTY SANITATION DISTRICTS
OF LOS ANGELES COUNTY

1955 Workman Mill Road, Whittier, CA 90601-1400
Mailing Address: P.O. Box 4998, Whittier, CA 90607-4998
Telephone: (562) 699-7411, FAX: (562) 699-5422
www.lacsd.org

STEPHEN R. MAGUIN
Chief Engineer and General Manager

January 22, 2007

File No. 31-900.13.10J

Daniel Fierros
Department of Regional Planning
Impact Analysis Section
320 West Temple Street
Los Angeles, CA 90012

Dear Mr. Fierros:

Landmark Village Draft Environmental Impact Report - TT 53108

The County Sanitation Districts of Los Angeles County (Districts) received a Draft Environmental Impact Report (DEIR) for the subject project on November 20, 2006. The Districts offer the following comments regarding sewerage service: 1

- ***Page 4.11-2, Paragraph 2:*** The DEIR refers to the conceptual backbone sewer plan as Exhibit 2.5-3 of the *Newhall Ranch Specific Plan*. This sewer plan is outdated. A new figure is required that accurately reflects the current plan for a backbone sewer system. 2

- ***Page 4.11-2, Paragraph 2; Page 4.11-8 Paragraph 3:*** In reference to the sanitation district serving Landmark Village, the DEIR states that "a new county sanitation district would be formed." The Local Area Formation Commission filed a Certificate of Completion for formation of the Newhall Ranch County Sanitation District effective July 27, 2006. 3

- ***Page 4.11-4, Paragraph 2; Page 4.11-15, Paragraph 1; Page 4.11-15, Paragraph 2:*** The DEIR states in several places that the Districts would not issue connection permits without sufficient capacity in its collection or treatment systems. Sizing of collection and treatment systems is based on regionally adopted general plans and population forecasts. System capacity is routinely monitored and incremental increases are made as necessary to accommodate projected growth. 4

- ***Page 4.11-6, Paragraph 1; Page 4.11-9, Paragraph 3:*** The DEIR provides incorrect information about the recent and planned expansions of the Valencia WRP. The Stage V expansion (9 mgd) was completed in May 2005. Based on population projections published in the most recent Southern California Association of Governments (SCAG) 2004 Regional Transportation Plan, the Valencia WRP has adequate capacity through the year 2015. Stage VI expansion would increase capacity by 6 mgd but will not be constructed until flow materializes. 5

DOC #738801

Recycled Paper

- ***Page 4.11-15, Paragraph 2:*** The DEIR provides incorrect information about the *Final 2015 Santa Clarita Valley Joint Sewerage System Facilities Plan and EIR* (2015 Plan). The 2015 Plan bases its wastewater projections on the SCAG 1996 Regional Transportation Plan. 6

- ***Page 4.11-15, Paragraph 2:*** The DEIR provides incorrect information about the amount of wastewater tributary to the Saugus and Valencia WRPs by 2015 and site capacities of these two plants. The 2015 Plan estimated that a total of 34.1 mgd would be tributary to its Saugus and Valencia WRPs by the year 2015, which is also the combined site capacity determined for these two plants. 7

Thank you for providing the Districts an opportunity to review and comment on the DEIR. Please do not hesitate to contact Mr. Sean Christian of my staff at extension 2707 if you have questions regarding these comments. 8

Very truly yours,

Stephen R. Maguin

Steven W. Highter
Supervising Engineer
Planning Section

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B2. Letter from Los Angeles County Sanitation Districts, dated January 22, 2007

Response 1

This comment is an introduction to comments that follow. No further response is required.

Response 2

The comment states that Exhibit 2.5-3 of the Newhall Ranch Specific Plan, referred to in the Landmark Village Draft EIR, Section 4.11, Wastewater Disposal, p. 4.11-2, should be revised, as it is outdated. The discussion referred to in the comment summarizes the Newhall Ranch Specific Plan Program EIR as it pertains to wastewater. The referenced backbone sewer plan is from the approved Newhall Ranch Specific Plan (May 2003), and it was expressly identified as a "conceptual" infrastructure plan for the sewer collection system within the Specific Plan. (See, Specific Plan, Section 2.5, p. 2-71 and pp. 2-77–2-78.) Upon approval of the Specific Plan, it was contemplated by the County that subsequent project-specific actions would provide further design and construction-level detail. Consistent with that approach, **Figure 1.0-31**, Landmark Village Portion of Specific Plan—Conceptual Backbone Sewer Plan, depicts the Specific Plan's Conceptual Backbone Sewer Plan as it relates to the Landmark Village project.

Response 3

The comment correctly points out that the Los Angeles County Local Area Formation Commission (LAFCO) already has approved formation of the Newhall Ranch County Sanitation District, effective July 27, 2006. The Landmark Village Final EIR will be updated accordingly. Please refer to the Final EIR **Section 3.0, Revised Draft EIR Pages**, for the requested revisions.

Response 4

The comment clarifies the Districts' approach for monitoring system capacity. This information will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not raise an environmental issue regarding the content of the Draft EIR, no further response is required.

Response 5

The requested changes have been made to reflect the County Sanitation Districts of Los Angeles County's comments on the Draft EIR. Please refer to the Final EIR **Section 3.0, Revised Draft EIR Pages 4.11-7** and **4.11-10**, for the requested revisions.

Response 6

The requested changes have been made to reflect the County Sanitation Districts of Los Angeles County's comments on the Draft EIR. Please refer to the Final EIR **Section 3.0, Revised Draft EIR Pages 4.11-16**, for the requested revisions.

Response 7

The requested changes have been made to reflect the County Sanitation Districts of Los Angeles County's comments on the Draft EIR. Please refer to the Final EIR **Section 3.0, Revised Draft EIR Pages 4.11-16**, for the requested revisions.

Response 8

The comment is noted. No further response is required given that the comment does not address or question the content of the Draft EIR.

Letter No. C1

Fierros, Daniel

From:	Jeff Ford [jford@clwa.org]
Sent:	Tuesday, January 16, 2007 10:17 AM
To:	Fierros, Daniel
Cc:	Meneses, Frank
Subject:	Extension of the Public Review Period for the Landmark Village Draft Environmental Impact Report
Follow Up Flag:	Follow up
Flag Status:	Red

Dear Mr. Fierros:

The Castaic Lake Water Agency (CLWA) has reviewed the Draft Environmental Impact Report for Landmark Village (SCH No. 2004021002) and respectfully requests an extension of the public review period on the document for at least 30 days. CLWA makes this request in light of the complicated nature of the project description and its relation to the Program EIR for the Newhall Ranch Specific Plan. CLWA would like adequate time to make meaningful comments and, given the substantial nature of the project, CLWA staff may want to present possible comments on the project to its Board of Directors, which would not meet again until after the close of comments on January 22, 2007. Therefore, we feel that an extension in the review period is warranted and we understand that similar requests for extension are being made by other agencies. 1

Sincerely,

Jeff Ford
Water Resources Planner
Castaic Lake Water Agency
27234 Bouquet Canyon Road
Santa Clarita, CA 91350
Phone: (661) 513-1281
Fax: (661) 513-1202
email: jford@clwa.org

1/23/2007

C1. Letter from Castaic Lake Water Agency, dated January 16, 2007

Response 1

The comment requests an extension of the public comment period on the Landmark Village Draft EIR by at least 30 days. The additional time has been provided. For additional information responsive to the comment, please refer to **Topical Response 3**: Public Review Opportunities.

Letter No. C2

CASTAIC LAKE WATER AGENCY

January 22, 2007

Mr. Daniel Fierros
Los Angeles County
Department of Regional Planning
320 West Temple Street
Los Angeles, CA 90012

Re: Draft Environmental Impact Report for Landmark Village (SCH No. 2004021002)

Dear Mr. Fierros,

The Castaic Lake Water Agency (CLWA) has reviewed the Draft Environmental Impact Report for Landmark Village (Draft EIR) and will submit comments prior to the close of the public hearing on the project as set forth in the "Notice of Completion and Availability and as provided by Section 21177 of the Public Resources Code. We understand that the public hearing on the Draft EIR is presently scheduled for 9:00 a.m. on Wednesday, January 31, 2007. If the hearing is to be continued, please advise us at your earliest convenience. 1

Sincerely,

Jeff Ford
Water Resources Planner

Cc: Michael Hurley, Water Resources Manager
Valerie Pryor, Administrative Services Manager

DIRECTORS
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website address: www.clwa.org

C2. Letter from Castaic Lake Water Agency, dated January 22, 2007

Response 1

The comment is noted. No further response is required given that the comment does not address or question the content of the Draft EIR.

Letter No. C3

SOUTHERN CALIFORNIA

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Ventura County: Judy Mikels, Ventura County • Glen Becerra, Simi Valley • Carl Morehouse, San Buenaventura • Toni Young, Port Hueneme

Orange County Transportation Authority: Lou Correa, County of Orange

Riverside County Transportation Commission: Robin Lowe, Hemet

Ventura County Transportation Commission: Keith Millhouse, Moorpark

22 January 2007

Mr. Daniel Fierros
Department of Regional Planning
County of Los Angeles
320 West Temple Street
Los Angeles, CA 90012

RE: SCAG Comments on the Notice of Availability of a Draft EIR for the Landmark Village Project - SCAG No. I 20060771

Dear Mr. Fierros,

Thank you for submitting the DEIR for the Landmark Village Project to the Southern California Association of Governments (SCAG) for review and comment. As the clearinghouse for regionally significant projects per Executive Order 12372, SCAG reviews the consistency of local plans, projects, and programs with regional plans. This activity is based on SCAG's responsibilities as a regional planning organization pursuant to state and federal laws and regulations. Guidance provided by these reviews is intended to assist local agencies and project sponsors to take actions that contribute to the attainment of regional goals and policies.

SCAG staff reviewed the aforementioned DEIR, and has determined that the proposed project is regionally significant per the California Environmental Quality Act (CEQA) Guidelines (Section 15206). The proposed project considers over 500 residential units.

CEQA requires that EIRs discuss any inconsistencies between the proposed project and applicable general plans and regional plans (Section 15125 [d]). If there are inconsistencies, an explanation and rationalization for such inconsistencies should be provided.

Policies of SCAG's Regional Comprehensive Plan and Guide, Regional Transportation Plan, and Compass Growth Vision that may be applicable to your project are outlined in the attachment. We expect the FEIR to specifically cite the appropriate SCAG policies and address the manner in which the project is consistent with applicable core policies or supportive of applicable ancillary policies. Please use our policy numbers to refer to them in your FEIR. Also, we would encourage you to use a side-by-side comparison of SCAG policies with a discussion of the consistency or support of the policy with the proposed project. 1

SCAG's Compass Growth Vision, adopted in 2004, encourages better relationships between housing, transportation, and employment. For a clearer understanding of the intent of and possibilities with Compass, please consult our website, www.socalcompass.org in addition to the guidance offered in this letter.

Please provide a minimum of 45 days for SCAG to review the FEIR when this document is available. If you have any questions regarding the attached comments, please contact me at (213) 236-1919. Thank you.

Sincerely,

Jill Egerman

Jill Egerman
Associate Regional Planner

**COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT REPORT
FOR THE LANDMARK VILLAGE PROJECT
SCAG NO. I 20060771**

PROJECT DESCRIPTION

The Landmark Village Project proposes to develop the 292.6 acre Landmark Village tract map site, located in the first phase of the Riverwood Village of the Newhall Ranch Specific Plan. The tract map site proposes construction of 1,444 residential dwelling units (308 single-family units, 1,136 multi-family units), up to 1,033,000 square feet of mixed-use/commercial uses, a 9-acre elementary school, a 16-acre community park, a fire station, public and private recreational facilities, trails, and road improvements. Several off-site project-related components would be developed on an additional 750.9 acres of land that is mostly within the approved Specific Plan boundary. The entire project site comprises approximately 1,044 gross acres. In addition, the applicant is requesting the approval of the following entitlements: (a) General Plan Amendment, Sub-Plan Amendment and Specific Plan Amendment; (b) Vesting Tentative Tract Map; (c) Significant Ecological Area (SEA) Conditional Use Permit (CUP); (d) Oak Tree Permit; (e) Off-Site Soil Transport Approval; (f) CUP for off-site grading; and (g) Modification to adopted County Floodway limits. 2

CONSISTENCY WITH REGIONAL COMPREHENSIVE PLAN AND GUIDE POLICIES

The **Growth Management Chapter (GMC)** of the Regional Comprehensive Plan and Guide (RCPG) contains the following policies that are particularly applicable and should be addressed in the EIR for the Landmark Village Project.

3.01 *The population, housing, and jobs forecasts, which are adopted by SCAG's Regional Council and that reflect local plans and policies, shall be used by SCAG in all phases of implementation and review.*

Regional Growth Forecasts

The EIR should reflect the most current SCAG forecasts, which are the 2004 RTP (April 2004) Population, Household and Employment forecasts. The forecasts for your region, subregions, and nearest city are as follows: 3

Adopted SCAG Regionwide Forecasts

	2010	2015	2020	2025	2030
Population	19,208,661	20,191,117	21,137,519	22,035,416	22,890,797
Households	6,072,578	6,463,402	6,865,355	7,263,519	7,660,107
Employment	8,729,192	9,198,618	9,659,847	10,100,776	10,527,202

Adopted North Los Angeles County Forecasts

	2010	2015	2020	2025	2030
Population	735,262	852,964	967,387	1,076,013	1,179,228
Households	221,538	256,966	292,658	327,745	362,324
Employment	215,955	235,070	253,417	270,409	286,286

DOC#130784

City of Santa Clarita Forecasts

	2010	2015	2020	2025	2030
Population	187,795	200,104	211,367	221,915	231,846
Households	62,837	67,832	72,883	77,868	82,806
Employment	57,248	60,691	64,012	67,133	70,078

*** The 2004 RTP growth forecast at the regional, county and subregional level was adopted by RC in April, 2004. City totals are the sum of small area data and should be used for advisory purposes only.**

SCAG staff comments: The Draft EIR, Section 2.0 at page 2.0-19 addressed the consistency of the project with this SCAG policy with the following:

> "Based on SCAG's most recent forecasts, by the year 2025, the Los Angeles region is expected to grow to approximately 22.6 million people, representing 7.4 million household units and 9.9 million jobs. This growth represents a population increase of 34.5 percent, an increase in housing of 37.9 percent, and an increase in employment of 34.2 percent between the years 2000 and 2025. SCAG's distribution of regional growth was developed through the subregional planning process. Development of the proposed project will accommodate an increase in population of about 3,680 persons and 1,444 housing units. The resultant increase in region-wide population is planned and considered negligible. While the proposed project would not create significant or permanent employment opportunities, it would provide new housing in support of existing and new employment opportunities expected to occur in the Santa Clarita Valley. A detailed analysis of the project's consistency with the population and housing forecasts for the North Los Angeles County subregion and City of Santa Clarita is provided in the Newhall Ranch Specific Plan Program EIR."

3

SCAG concurs with this assessment and concludes that the project would be consistent with Policy 3.01.

3.03 The timing, financing, and location of public facilities, utility systems, and transportation systems shall be used by SCAG to implement the region's growth policies.

SCAG staff comments: The Draft EIR, Section 2.0 pages 2.0-18 and 2.0-10, provides a discussion on the consistency of the project with this SCAG policy with the following:

> "The proposed Landmark Village project represents the first phase of the Newhall Ranch Specific Plan, which contains backbone water, sewer, and drainage plans that generally identify the size and location of needed infrastructure. The proposed project would be developed over five years as part of Vesting Tentative Tract Map No. 53108, which represents the phasing mechanism used by the Specific Plan to identify the timing and sizing of necessary infrastructure.
> Given the existence of the approved Specific Plan, and that the proposed project is located adjacent to existing infrastructure, Landmark Village would represent an orderly progression of development that would aid in implementing the region's growth policies. The proposed project would use various techniques currently available for financing and maintenance of public facilities, streets, and utilities. For example, the applicant could decide to finance the infrastructure and services necessary to serve the project through a Community Facilities District under the provisions of the Mello-Roos Communities Facilities Act of 1982. Such a district is formed to finance designated public services and capital facilities by levying special taxes within the specific plan area.
> While the exact financing method has not yet been decided, the County and the property owner/developer must mutually agree to the method and enter into an agreement reflecting

4

the selected financing and maintenance method. As proposed, the project would be consistent with the region's growth policies."

SCAG concurs with this assessment and concludes that the proposed project is consistent with SCAG policy 3.03. 4

GMC POLICIES RELATED TO THE RCPG GOAL TO IMPROVE THE REGIONAL STANDARD OF LIVING

The Growth Management goals to develop urban forms that enable individuals to spend less income on housing cost, that minimize public and private development costs, and that enable firms to be more competitive, strengthen the regional strategic goal to stimulate the regional economy. The evaluation of the proposed project in relation to the following policies would be intended to guide efforts toward achievement of such goals and does not infer regional interference with local land use powers.

3.05 *Encourage patterns of urban development and land use which reduce costs on infrastructure construction and make better use of existing facilities.*

SCAG staff comments: Please see comments under 3.10.

3.09 *Support local jurisdictions' efforts to minimize the cost of infrastructure and public service delivery, and efforts to seek new sources of funding for development and the provision of services.*

SCAG staff comments: Please see comments under 3.10.

3.10 *Support local jurisdictions' actions to minimize red tape and expedite the permitting process to maintain economic vitality and competitiveness.* 5

SCAG staff comments: The Draft EIR, Section 2.0 at pages 2.0-20, 2.0-21 addressed the consistency of the project with SCAG policies 3.5, 3.9, and 3.10 by the following:

"The Landmark Village site is located near existing urban uses that are supported by a full complement of roadways, water, sewer, electricity, natural gas, communications links, cable, and other urban infrastructure. In addition, existing development in the area is served by local law enforcement and fire protection services. As a result, extension of these services to proposed on-site uses would make use of existing facilities. Project residents would generate revenue in the form of property taxes, fees, etc., which would be available to the County to fund public services on site, such as fire and police services, flood control, library services, street maintenance, and wastewater treatment. Revenues for capital improvements would also be generated by the project directly through various forms of development fees, including, but not limited to, bridge and thoroughfare fees, fire facilities fees, sewer annexation and construction fees, and school fees. In addition, the project would build all on-site roadways, potable water, sewer, energy, and communications systems, as well as share in the upgrade of all affected roadways. Financing mechanisms for needed on-site infrastructure improvements and supporting public service facilities could possibly include, but are not limited to, private financing, assessment districts, fee districts, and Mello-Roos districts. As such the project is consistent with these RCPG policies."

DOC#130784

SCAG concurs with this assessment and concludes that the proposed project is consistent with SCAG policies 3.5, 3.9, and 3.10 5

GMC POLICIES RELATED TO THE RCPG GOAL TO IMPROVE THE REGIONAL QUALITY OF LIFE

The Growth Management goals to attain mobility and clean air goals and to develop urban forms that enhance quality of life, that accommodate a diversity of life styles, that preserve open space and natural resources, and that are aesthetically pleasing and preserve the character of communities, enhance the regional strategic goal of maintaining the regional quality of life. The evaluation of the proposed project in relation to the following policies would be intended to provide direction for plan implementation, and does not allude to regional mandates.

3.12 *Encourage existing or proposed local jurisdictions' programs aimed at designing land uses which encourage the use of transit and thus reduce the need for roadway expansion, reduce the number of auto trips and vehicle miles traveled, and create opportunities for residents to walk and bike.*

SCAG staff comments: Please see comments under 3.14

3.14 *Support local plans to increase density of future development located at strategic points along the regional commuter rail, transit systems, and activity centers.*

SCAG staff comments: The Draft EIR, Section 2.0 pages 2.0-21 and 2.0-22, provides a discussion on the consistency of the project with SCAG policies 3.12 and 3.14 with the following: 6

> "Two major transit carriers serve the Landmark Village project study area, the Santa Clarita Transit (SCT) system operated by the City of Santa Clarita and Metrolink operated by the Southern California Regional Rail Authority (SCRRA). The SCT largely serves the Santa Clarita Valley, while Metrolink currently serves Ventura, Los Angeles, San Bernardino, Riverside, Orange, and San Diego Counties.
> The SCT route passes the tract map site via SR-126 and provides service to the Santa Clarita and Newhall Metrolink Stations, the Valencia Industrial and Commerce Centers, and the Valencia Town Center area. Buses run every 30 minutes. Route 2 connects with other bus routes at McBean Transfer Station, and connects with commuter trains at the Jan Heidt Metrolink Station in Newhall. Major destinations along Route 2 are Soledad Entertainment Center, Newhall, Newhall Metrolink Station, Valencia Town Center, Valencia Industrial Center, Valencia Commerce Center, and Val Verde.
> SCT commuter busses provide regional service to downtown Los Angeles, the San Fernando Valley and the Antelope Valley. . . .
> The proposed project is consistent with these transit policies because it would place development in an area presently served by local and regional transit. It can also be considered consistent because of its extensive pedestrian and bicycle trails network, which are linked to adjacent uses and roadways. This network would provide project residents wit a combination of transportation modes including bicycling, walking, and driving. Furthermore, because the project has been designed to provide housing that would support existing and new employment opportunities that are projected to occur in the Santa Clarita Valley, it could reduce travel distances and could create opportunities for employees to walk and bike to work."

SCAG concurs with this assessment and concludes that the proposed project is consistent with

SCAG policies 3.12 and 3.14. 6

3.17 *Support and encourage settlement patterns which contain a range of urban densities.*

SCAG staff comments: Please see comments under 3.19.

3.18 *Encourage planned development in locations least likely to cause adverse environmental impact.*

SCAG staff comments: Please see comments under 3.19.

3.19 *National Forests shall remain permanently preserved and used as open space. SCAG shall support policies and actions that preserve open space areas identified in local, state, and federal plans.*

SCAG staff comments: The Draft EIR, Section 2.0 at pages 2.0-22 and 2.0-23 addressed the consistency of the project with SCAG policies 3.17, 3.18, and 3.19 by the following:

> "The Landmark Village tract map site is largely disturbed due to ongoing agricultural activity and is planned for development as part of the Newhall Ranch Specific Plan, which implements the goals and policies of the Los Angeles County General Plan and Santa Clarita Valley Areawide Plan on a focused, site-specific basis. The approved Newhall Ranch project site is located adjacent to developed uses and is subject to the provisions of the Specific Plan. The Specific Plan contains a conceptual development plan, development regulations, design guidelines, and implementation mechanisms consistent with the goals, objectives, and policies of the Los Angeles County General Plan and Santa Clarita Valley Areawide Plan, including those directed towards protection of open space and natural resources. 7
> The project design was developed consistent with the Resource Management Plan (Section 2.6 of the Specific Plan) and the resource conservation objectives of the Specific Plan. Design considerations included establishment of an adequate buffer between residential uses and sensitive resources to enhance the habitat value of the natural area and preserve the river resources. To this end, roughly 38 acres of the Landmark Village project site would be dedicated to open space. The Landmark Village project would also construct a Community Park consistent with the Specific Plan as well as trails and major utility easements that function as a separation between development areas south of the SR 126 and the Santa Clara River. For these reasons, the project is consistent with these RCPG policies."

SCAG concurs with this assessment and concludes that the proposed project is consistent with SCAG policies 3.17, 3.18, and 3.19.

3.20 *Vital resources as wetlands, groundwater recharge areas, woodlands, production lands, and land containing unique and endangered plants and animals should be protected.*

SCAG staff comments: The Draft EIR, Section 2.0 at pages 2.0-23 through 2.0-25 addressed the consistency of the project with this SCAG policy by the following excerpted comments: 8

> "The Landmark Village tract map site is largely disturbed from ongoing agricultural activity but it is located adjacent to the River Corridor SMA/SEA 23. SEA 23 was originally established along the Santa Clara River to protect the variety of riparian habitat found within and along its corridor. In general terms, the purpose of designating SEAs is to maintain and protect areas that possess biotic resources that are uncommon, rare, unique, or critical to

DOC#130784

the maintenance of wildlife. More specifically, SEA 23 was established to conserve habitat for four federally listed endangered species: (1) unarmored three-spine stickleback, (2) least Bell's vireo, (3) Southwestern pond turtle, and (4) arroyo Southwestern toad in the Santa Clarita Valley

The proposed Landmark Village project represents the first phase of construction within the Newhall Ranch Specific Plan, and the applicant is planning to construct a number of improvements within the River Corridor SMA/SEA 23 as contemplated by the Program SEA CUP No. 94-087-(5), including the Long Canyon Road Bridge, trails, water quality basins, bank stabilization, water and sewer utility crossings, storm drain outlets, and potential riparian mitigation sites.

Consistent with the approved SEA CUP, the Landmark Village project has been designed to lessen direct and indirect impacts to the sensitive resources found within the River Corridor SMA/SEA 23. The site plan incorporates a setback to separate natural resources in the River Corridor SMA/SEA 23 from the residential and mixed uses associated with the project. Where improvements must be constructed in the River Corridor SMA/SEA 23, they have been sensitively designed to minimize permanent disturbance.

The drainage concept for Landmark Village proposes the use of buried bank stabilization where necessary to protect against erosion except at bridge crossings, where exposed grouted rip-rap or reinforced concrete would be used. . . . Consequently, under most circumstances, project improvements would not hinder river flows or reduce the area of the floodplain. Instead, these flows would spread across the river channel, unaffected by the bank protection and bridge abutments.

The Landmark Village tract map site would also introduce people and animals into this resource area as the project would implement a segment of the River Trail as identified by the Master Trails Plan of the Newhall Ranch Specific Plan. However, access to trails in the River Corridor SMA/SEA 23 must be restricted to daytime hours as defined by the management component of the Resource Management Plan. In addition, the River Trail is separated from the natural resources by fencing or other barriers to discourage intrusion into natural areas. Based on the above, the project is considered consistent with these policies."

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SCAG concurs with this assessment and concludes that the proposed project is partially consistent with SCAG policy 3.20. The Draft EIR, Section 4.4 discusses impacts from the Newhall Ranch Specific Plan on biological resources that would remain significant after mitigation. It would be helpful if the Final EIR would provide a discussion and address the manner in which Landmark Village is supportive or detracts from the achievement of protecting wetlands, production lands, and land containing unique and endangered plants and animals. Based on the information provided in the Draft EIR, we are unable to determine if the project is fully consistent with Policy 3.20. Please address this in the Final EIR.

3.21 *Encourage the implementation of measures aimed at the preservation and protection of recorded and unrecorded cultural resources and archaeological sites.*

SCAG staff comments: The Draft EIR, Section 4.22 addressed the consistency of the project with this SCAG policy. The impact analysis of Landmark Village on archeological resources included an examination of the impacts of the Landmark Village project on the site's archeological and paleontological resources. Section 4.22 of the DEIR reiterated the Mitigation measures required by the Adopted Newhall Ranch Specific Plan, as they relate to the Landmark Village Project and also set forth the Additional Mitigation Measures proposed by this EIR. As such, SCAG concludes that the proposed project is consistent with SCAG policy 3.21.

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3.22 *Discourage development, or encourage the use of special design requirements, in areas with steep slopes, high fire, flood, and seismic hazards.*

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SCAG staff comments: Please see comments under 3.23.

3.23 *Encourage mitigation measures that reduce noise in certain locations, measures aimed at preservation of biological and ecological resources, measures that would reduce exposure to seismic hazards, minimize earthquake damage, and to develop emergency response and recovery plans.*

SCAG staff comments: The Draft EIR, Section 2.0 at pages 2.0-25 and 2.0-26 addressed the consistency of the project with SCAG policies 3.22 and 3 23 by the following:

> "The Landmark Village tract map site is flat and site development would not expose people to hazards associated with steep slopes. As with all areas in Southern California, the site is subject to seismic hazards associated with local and regional fault systems and uses on the site would be subject to building codes addressing seismic hazards. The site is located adjacent to the Santa Clara River and portions of the site are within the Federal Emergency Management Act (FEMA) 100-year flood boundary. The project contains a drainage concept that would protect people and development from flood hazards. In addition, the Los Angeles County Fire Department designates the project site as Zone 4, High Fire Hazard, so the project would be subject to Section 1117.2.1 of the County Fire Code, which requires preparation of a fuel modification plan, landscape plan, and irrigation plan for developed areas.
> The proposed project has been designed consistent with the Land Use Plan component of the Newhall Ranch Specific Plan. Less sensitive Commercial and Medium-Density residential uses are planned along SR-126. In addition, mitigation measures have been incorporated into this EIR that will minimize impacts to those residential units closest to SR-126, San Martinez Grande, and Chiquito Canyon Road.
> As described above under Policy 3.20, the Landmark Village tract map site is disturbed from ongoing agricultural activity but is located adjacent to sensitive resources in the River Corridor SMA/SEA 23. The project itself has been designed to minimize impacts to sensitive resources. Where necessary, mitigation measures have been proposed, which would reduce impacts to sensitive biological and ecological resources to the extent feasible.
> In summary, hazards to the project associated with wildfires, flooding and seismic events would be reduced to less than significant levels through compliance with building and fire codes, as required by the County of Los Angeles. Impacts associated with roadway noise and disturbance to natural resources are addressed through site design and implementation of recommended mitigation measures in this EIR."

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As such, SCAG concurs with this assessment and concludes that the proposed project is consistent with SCAG policies 3.22 and 3 23.

GMC POLICIES RELATED TO THE RCPG GOAL TO PROVIDE SOCIAL, POLITICAL, AND CULTURAL EQUITY

The Growth Management Goal to develop urban forms that avoid economic and social polarization promotes the regional strategic goal of minimizing social and geographic disparities and of reaching equity among all segments of society. The evaluation of the proposed project in relation to the policy stated below is intended guide direction for the accomplishment of this goal, and does not infer regional mandates and interference with local land use powers.

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3.24 *Encourage efforts of local jurisdictions in the implementation of programs that increase the supply and quality of housing and provide affordable housing as evaluated in the Regional Housing Needs*

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Assessment.

SCAG staff comments: Please see comments under 3.27.

3.27 *Support local jurisdictions and other service providers in their efforts to develop sustainable communities and provide, equally to all members of society, accessible and effective services such as: public education, housing, health care, social services, recreational facilities, law enforcement, and fire protection.*

SCAG staff comments: The Draft EIR, Section 2.0 at pages 2.0-27 and 2.0-28 addressed the consistency of the project with SCAG policies 3.24 and 3.27 by the following:

> "SCAG prepares the Regional Housing Needs Assessment (RHNA) for a six-county region that includes Ventura, Los Angeles, San Bernardino, Riverside, Orange and Imperial Counties and some 150 local governments. The RHNA defines the housing need allocation for each member local government in Southern California, including Los Angeles County. This total need is divided into housing construction need for households in four broad income categories . . . For the unincorporated area, this need has been determined to be 9,019 units of very low-income housing, 7,519 units of low-income housing, 9,859 units of moderate-income housing, and 25,835 units of above moderate-income housing.
> Section 3.10 of the adopted Newhall Ranch Specific Plan includes an Affordable Housing Program that provides for the direct inclusion of very low, low, and moderate income affordable housing opportunities within the Specific Plan area. At buildout, a total of 2,200 affordable dwelling units would be provided. The Affordable Housing Program includes timing mechanisms and monitoring provisions to ensure that affordable housing is provided concurrent with market rate housing. The applicant is required to identify the number and location of affordable housing units as a condition of tentative or final map approval.
> The Landmark Village project proposes a total of 1,444 dwelling units. Approximately 296 units located in the project's Medium Residential, High Residential, and Mixed-Use land use categories would be set aside as affordable under the Affordable Housing Program of the Newhall Ranch Specific Plan. An affirmative marketing program consisting of advertising in newspapers, information flyers, promotional materials, and on-site signage would be used to assure opportunities for local residents. The variety of housing types proposed for the project site, combined with implementation of apportion of the Newhall Ranch Affordable Housing Program, will serve to assist in meeting the County's housing needs, which cover all levels of the economic spectrum.
> The Landmark Village project would implement the firs phase of the Newhall Ranch Specific Plan, which is a balanced community containing the full range of community and social services. The Landmark Village project site is currently served by one fixed-route transit line (Route 2). The route passes the project site via SR-126 and provides service to the Newhall Metrolink Station, the Valencia Industrial and Commerce Centers, and the Valencia Town Center area. Buses run every 30 minutes. Route 2 connects with other bus routes at McBean Transfer Station, and connects with commuter trains at the Jan Heidt Metrolink Station in Newhall. Major destinations along Route 2 are Soledad Entertainment Center, Newhall, Newhall Metrolink Station, Valencia Town Center, Valencia Industrial Center, Valencia Commerce Center, and Val Verde. Close proximity of the project site to regional transportation modes provides greater opportunity for all members of society access to public education, housing, health care, social and recreational services (provided within and outside of the project), law enforcement and fire services."

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SCAG concurs with this assessment and concludes that the proposed project is consistent with SCAG policies 3.24 and 3.27.

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AIR QUALITY CHAPTER CORE ACTIONS

The **Air Quality Chapter (AQC)** core actions that are generally applicable to the Project are as follows:

5.07 *Determine specific programs and associated actions needed (e.g., indirect source rules, enhanced use of telecommunications, provision of community-based shuttle services, provision of demand management based programs, or vehicle-miles-traveled/emission fees) so that options to command and control regulation can be assessed.*

SCAG staff comments: Please see comments under 5.11.

5.11 *Through the environmental document review process, ensure that plans at all levels of government (regional, air basin, county, subregional and local) consider air quality, land use, transportation and economic relationships to ensure consistency and minimize conflicts.*

SCAG staff comments: The Draft EIR Section 2.0 at pages 2.0-31 and 2.0-32 addressed the consistency of the project with SCAG policies 5.07 and 5.11 by the following:

> "The Landmark Village tract map site proposes the construction of an arterial street/infrastructure system and a network of pedestrian and bicycle tails that would provide for local travel by a combination of transportation modes, including bicycles, walking, bus transit, commuter rail service, and automobiles. The project also incorporates bus pull-ins, as necessary to accommodate bus-related transit and proposes to fund its fair share of infrastructure improvements required off site through the payment of fees. As indicated in this EIR, Section 4.7, Traffic/Access, funding and construction of main-line freeway capacity (i.e., I-5 and SR-14) and interchanges with other regional highways (i.e., I-5 at SR-126) is provided by existing sources of tax revenue and by Caltrans through allocations made by the Metropolitan Transportation Authority (MTA). Existing funding sources include state and federal gas taxes and Los Angeles County Proposition A and C sales taxes. As transportation improvements are constructed over the life of the project, the desire to improve air quality while providing adequate transportation infrastructure can be facilitated. Consequently, the project favorably addresses this issue.
>
> As indicated above, the project proposes a pattern of development that includes a wide range of housing unit types and job-creating uses. These uses would be linked by an arterial street system and a pedestrian and bicycle trails network that provide for local travel by a combination of transportation modes, including bicycles, walking, bus transit, and automobiles. The project has been designed to provide future residents of the site with employment opportunities and services within proximity to the project, through the inclusion of the commercial site. Access to the community-wide trail system promotes an efficient means of access to these uses; therefore, VMT and air pollutant emissions can be minimized. Furthermore, the project is located in close proximity and adjacent to existing job centers (e.g., Valencia Commerce Center, Industrial Center, Town Center, and Corporate Center) which would help to reduce the need for long commutes from the site to more distant employment centers in Ventura County, the San Fernando Valley, and beyond. As a result, VMT and, consequently, air pollution emissions would be minimized. Based on this information, the proposed project favorably addresses the above-noted air quality core actions."

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SCAG concurs with this assessment and concludes that the proposed project is consistent with SCAG policies 5.07 and 5.11.

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OPEN SPACE CHAPTER ANCILLARY GOALS

The **Open Space and Conservation Chapter** goals related to the proposed project include:

9.02 *Increase the accessibility to open space lands for outdoor recreation.*

SCAG staff comments: Please see comments under 9.03.

9.03 *Promote self-sustaining regional recreation resources and facilities.*

SCAG staff comments: Section 2.0 of the DEIR, pages 2.0-33 and 2.0-34 addressed the consistency of the project with SCAG policies 9.2 and 9.3 with the following: 13

> "The Landmark Village tract map site provides a variety of open space for both passive and active recreation. Consistent with the Specific Plan's Community Park that contains both active and passive recreational areas. The project also implements a segment of the Regional River Trail and Community Trails identified in the Specific Plan's Master Trails Plan. A river outlook point is located in the passive area of the Community Park, which is accessed by both the Regional River Trail and the Community Trail system. Thus, the proposed project is considered consistent with outdoor recreation and public health and safety policies identified in the Open Space Chapter of the RCPG."

SCAG concurs with the above assessment and concludes that the proposed project is consistent with SCAG policies 9.02 and 9.03.

9.04 *Maintain open space for adequate protection of lives and properties against natural and man-made hazards.*

SCAG staff comments: Please see comments under 9.05.

9.05 *Minimize potentially hazardous developments in hillsides, canyons, areas susceptible to flooding, earthquakes, wildfire and other known hazards, and areas with limited access for emergency equipment.*

SCAG staff comments: Section 2.0 of the DEIR, page 2.0-34 addressed the consistency of the project with SCAG policies 9.4 and 9.5 with the following: 14

> "Open spaces proposed within the Landmark Village project site would be maintained and owned by a Homeowners Association or the County of Los Angeles to ensure that open space areas protect both persons and properties against natural and manmade hazards. Implementation of geotechnical reports and drainage concepts as well as review of plans by the Los Angeles County Sheriff and Fire Departments will ensure that development located in areas susceptible to flooding, earthquakes, and wildfire hazards are constructed and situated so as to minimize and avoid potential hazards. Subsequently the proposed project is considered consistent with Policies 9.04 and 9.05 of the Open Space Chapter of the RCPG."

SCAG concurs with the above assessment and concludes that the proposed project is consistent with SCAG policies 9.04 and 9.05.

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9.07 Maintain adequate viable resource production lands, particularly lands devoted to commercial agriculture and mining operations.

SCAG staff comments: Section 2.0 of the DEIR, pages 2.0-34 and 2.0-35 addressed the consistency of the project with this SCAG policy with the following:

> "The Landmark Village tract map site is presently cultivated with row crops. Site development as proposed would result in the loss of 292 acres of active farmland. The economic and agricultural productivity of the Landmark Village site is constrained, as the property is isolated from nearby agricultural lands by the presence of SR-126 and the Santa Clara River. The loss of 292 acres of agricultural land for development of Landmark Village represents a significant unavoidable impact that was considered in the CEQA Findings adopted by the County Board of Supervisors for the Newhall Ranch Specific Plan.
> A number of overriding economic, legal, social technological and other considerations were identified in the Statement of Overriding Considerations to determine that these benefits outweighed the loss of this agricultural land. The Landmark Village project is the first subdivision map filed under the Specific Plan."

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SCAG concurs with the above assessment and concludes that the proposed project is consistent with SCAG policy 9.07.

9.08 Develop well-managed viable ecosystems or known habitats of rare, threatened and endangered species, including wetlands.

SCAG staff comments: Section 2.0 of the DEIR, page 2.0-35 addressed the consistency of the project with this SCAG policy with the following:

> "The Landmark Village project site has been designed to minimize direct and indirect impacts to the sensitive resources found within the River Corridor SMA/SEA 23. For example, the site plan incorporates a setback to separate natural resources in the River Corridor SMA/SEA 23 from the residential and mixed uses associated with the project. Where improvements must be constructed in the River Corridor SMA/SEA 23, they have been sensitively designed to minimize permanent disturbance. Mitigation measures have been incorporated into the proposed project (Section 4.4, Biota) to minimize impacts on the endangered species, which reside in the Santa Clara River. Consequently, the proposed project is considered consistent with Policy 9.08 of the Open Space Chapter of the RCPG."

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SCAG concurs with the above assessment and concludes that the proposed project is consistent with SCAG policy 9.08.

WATER QUALITY CHAPTER RECOMMENDATIONS AND POLICY OPTIONS

The **Water Quality Chapter** core recommendations and policy options relate to the two water quality goals: to restore and maintain the chemical, physical and biological integrity of the nation's water; and, to achieve and maintain water quality objectives that are necessary to protect all beneficial uses of all waters.

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11.07 Encourage water reclamation throughout the region where it is cost-effective, feasible, and

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appropriate to reduce reliance on imported water and wastewater discharges. Current administrative impediments to increased use of wastewater should be addressed.

SCAG staff comments: Section 2.0 of the DEIR, page 2.0-33 addressed the consistency of the project with this SCAG policy with the following: "The Landmark Village tract map site proposes the use of reclaimed water for landscape irrigation purposes, consistent with the Public Services and Facilities Plan of the Newhall Ranch Specific Plan. The project is considered consistent with this policy." SCAG concurs with the above assessment and concludes that the proposed project is consistent with SCAG policy 11.07 17

REGIONAL TRANSPORTATION PLAN

The **2004 Regional Transportation Plan (RTP)** also has goals and policies that are pertinent to this proposed project. This RTP links the goal of sustaining mobility with the goals of fostering economic development, enhancing the environment, reducing energy consumption, promoting transportation-friendly development patterns, and encouraging fair and equitable access to residents affected by socio-economic, geographic and commercial limitations. The RTP continues to support all applicable federal and state laws in implementing the proposed project. Among the relevant goals and policies of the RTP are the following:

Regional Transportation Plan Goals
- Protect the environment, improve air quality and promote energy efficiency.
- Encourage land use and growth patterns that complement our transportation investments.

Regional Transportation Plan Policies
- Transportation investments shall be based on SCAG's adopted Regional Performance Indicators. 18

Performance Indicator	Performance Measures	Definition	Performance Outcome
Mobility	• Average Daily Speed	Speed-experienced by travelers regardless of mode.	10% Improvement
	• Average Daily Delay	Delay-excess travel time resulting from the difference between a reference speed and actual speed. Total daily delay and daily delay per capita are indicators used.	40% Improvement
Accessibility	• Percent PM peak work trips within 45 minutes of home		Auto 90% Transit 37%
	• Distribution of work trip travel times		Auto 8% Improvement Transit 8% Improvement
Reliability	• Percent variation in travel time	Day-to-day change in travel times experienced by travelers. Variability results from accidents, weather, road closures, system problems and other non-recurrent conditions.	10% Improvement
Safety	• Accident Rates	Measured in accidents per million vehicle miles by mode.	0.3% Improvement

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Performance Indicator	Performance Measures	Definition	Performance Outcome
Cost Effectiveness	• Benefit-to-Cost (B/C) Ratio	Ratio of benefits of RTP investments to the associated investments costs.	$3.08
Productivity	• Percent capability utilized during peak conditions	Transportation infrastructure capacity and services provided. • Roadway Capacity - vehicles per hour per lane by type of facility. • Transit Capacity – seating capacity utilized by mode.	 20% Improvement at known bottlenecks N/A
Sustainability	• Total cost per capita to sustain current system performance	Focus in on overall performance, including infrastructure condition Preservation measure is a sub-set of sustainability	$20 per capita, primarily in preservation costs
Preservation	• Maintenance cost per capita to preserve system at base year conditions	Focus is on infrastructure condition. Sub-set of sustainability.	Maintain current conditions
Environmental	• Emissions generated by travel	Measured/forecast emissions include CO, NOX, PM10, SOX and VOC. CO2 as secondary measure to reflect greenhouse emissions.	Meets conformity requirements
Environmental Justice	• Expenditures by quintile and ethnicity	Proportionate share of expenditures in the 2004 RTP by each quintile.	No disproportionate impact to any group or quintile
	• Benefit vs. burden by quintiles	Proportionate share of benefits to each quintile ethnicity. Proportionate share of additional airport noise by ethnic group.	

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- Ensuring safety, adequate maintenance, and efficiency of operations on the existing multi-modal transportation system will be RTP priorities and will be balanced against the need for system expansion investments.

- RTP land use and growth strategies that differ from currently expected trends will require a collaborative implementation program that identifies required actions and policies by all affected agencies and sub-regions.

4.01 Transportation Investments shall be based on SCAG's adopted Regional Performance Indicators.

SCAG's Adopted Regional Performance Indicators:

Mobility - Transportation Systems should meet the public need for improved access, and for safe, comfortable, convenient and economical movements of people and goods.
- Average Work Trip Travel Time in Minutes – 22 minutes
- PM Peak Highway Speed – 33 mph
- Percent of PM Peak Travel in Delay (All Trips) – 33%

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Accessibility - Transportation Systems should ensure the ease with which opportunities are reached. Transportation and land use measures should be employed to ensure minimal time and cost
- Work Opportunities within 25 Minutes – 88%

Environment - Transportation Systems should sustain development and preservation of the existing system and the environment. (All Trips)
- Meeting Federal and State Standards – Meet Air Plan Emission Budgets

Reliability - Reasonable and dependable levels of service by mode. (All Trips)
- Transit – 63%
- Highway – 76%

Safety - Transportation Systems should provide minimal, risk, accident, death and injury. (All Trips)
- Fatalities Per Million Passenger Miles – 0.008
- Injury Accidents – 0.929

Livable Communities - Transportation Systems should facilitate Livable Communities in which all residents have access to all opportunities with minimal travel time. (All Trips)
- Vehicle Trip Reduction – 1.5%
- Vehicle Miles Traveled Reduction – 10.0%

Equity - The benefits of transportation investments should be equitably distributed among all ethnic, age and income groups. (All trips)
- **Low-Income (Household Income $12,000)) Share of Net Benefits** – Equitable Distribution of Benefits

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Cost-Effectiveness - Maximize return on transportation investment. (All Trips)
- Net Present Value – Maximum Return on Transportation Investment
- Value of a Dollar Invested – Maximum Return on Transportation Investment

SCAG staff comments: Section 2.0 of the DEIR, page 2.0-30 addressed the consistency of the project with this SCAG policy with the following:

"The Landmark tract map is proposed to accommodate projected regional growth in a location that is adjacent to existing and planned infrastructure, urban services, transportation corridors, and major employment centers. Because the project has been designed to provide housing that would support existing and new employment opportunities that are projected to occur in the Santa Clarity Valley, it could reduce travel distances and could create opportunities for employees to walk and bike to work, thereby reducing vehicle miles traveled (VMT). The project also includes a mobility system that includes alternatives to automobile use, such as an extensive pedestrian, equestrian and bicycle trail system. The trails provide linkages from homes at the site to important destinations within the community, such as the school and park, recreation centers, and nearby commercial developments. The project would provide safe and convenient access to the local bus system and to the Metrolink commuter train station in Newhall. By providing for convenient access to public transit opportunities, the project would help to minimize travel time to work.

The proposed project would preserve the environment by providing for needed housing and opportunities to work closer to home. The shorter travel distances will reduce VMT and associated emissions by shortening the distance between home and work and providing safe and convenient access to public transit opportunities.

A traffic study for Landmark Village has been prepared and is discussed fully in this EIR. The study evaluates project-related, as well as long-term, Santa Clarity Valley buildout traffic impacts

on local and regional road networks.
The project includes a number of on- and off-site transportation system management actions, such as traffic signals and intersection improvements to speed the flow of traffic. Mitigation measures are proposed for traffic improvements and traffic signals, and comply with the requirements of the County's Congestion Management Program. As a result, the project is consistent with these RTP policies."

SCAG concurs with the above assessment and concludes that the proposed project will not affect the implementation of the goals. 18

GROWTH VISIONING

The fundamental goal of the Compass Growth Visioning effort is to make the SCAG region a better place to live, work and play for all residents regardless of race, ethnicity or income class. Thus, decisions regarding growth, transportation, land use, and economic development should be made to promote and **sustain** for future generations the region's **mobility, livability** and **prosperity**. The following "Regional Growth Principles" are proposed to provide a framework for local and regional decision making that improves the quality of life for all SCAG residents. Each principle is followed by a specific set of strategies intended to achieve this goal.

Principle 1: Improve **mobility** for all residents
- Encourage transportation investments and land use decisions that are mutually supportive.
- Locate new housing near existing jobs and new jobs near existing housing.
- Encourage transit-oriented development.
- Promote a variety of travel choices

Principle 2: Foster **livability** in all communities
- Promote infill development and redevelopment to revitalize existing communities.
- Promote developments, which provide a mix of uses.
- Promote "people scaled," walkable communities.
- Support the preservation of stable, single-family neighborhoods. 19

Principle 3. Enable **prosperity** for all people
- Provide, in each community, a variety of housing types to meet the housing needs of all income levels.
- Support educational opportunities that promote balanced growth.
- Ensure environmental justice regardless of race, ethnicity or income class.
- Support local and state fiscal policies that encourage balanced growth
- Encourage civic engagement

Principle 4: Promote **sustainability** for future generations
- Preserve rural, agricultural, recreational and environmentally sensitive areas.
- Focus development in urban centers and existing cities.
- Develop strategies to accommodate growth that uses resources efficiently, eliminate pollution and significantly reduce waste.
- Utilize "green" development techniques.

SCAG staff comments: Section 7.0 of the Draft EIR at page 7.0-1 addressed the growth-inducing impacts of the entire Newhall Ranch Specific Plan, by referring to the certified Newhall Ranch Specific Plan Program EIR. It would be helpful if the Final EIR would provide a discussion and address the manner in which the Landmark Village project is supportive or detracts from each of the four principles

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of the Compass Growth Visioning effort. Based on information provided in the Draft EIR, we are unable to determine if the Project is supportive of SCAG policy 19

CONCLUSIONS

1. As noted in the staff comments, the proposed Draft EIR for the Landmark Village Project is consistent with or supports many of the core and ancillary policies in the RCPG and RTP. 20

2. All feasible measures needed to mitigate any potentially negative regional impacts associated with the proposed project should be implemented and monitored, as required by CEQA.

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SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS

Roles and Authorities

THE SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS (SCAG) is a ***Joint Powers Agency*** established under California Government Code Section 6502 et seq. Under federal and state law, SCAG is designated as a Council of Governments (COG), a Regional Transportation Planning Agency (RTPA), and a Metropolitan Planning Organization (MPO). SCAG's mandated roles and responsibilities include the following:

SCAG is designated by the federal government as the Region's ***Metropolitan Planning Organization*** and mandated to maintain a continuing, cooperative, and comprehensive transportation planning process resulting in a Regional Transportation Plan and a Regional Transportation Improvement Program pursuant to 23 U.S.C. '134, 49 U.S.C. '5301 et seq., 23 C.F.R. '450, and 49 C.F.R. '613. SCAG is also the designated ***Regional Transportation Planning Agency***, and as such is responsible for both preparation of the Regional Transportation Plan (RTP) and Regional Transportation Improvement Program (RTIP) under California Government Code Section 65080 and 65082 respectively.

SCAG is responsible for developing the demographic projections and the integrated land use, housing, employment, and transportation programs, measures, and strategies portions of the ***South Coast Air Quality Management Plan***, pursuant to California Health and Safety Code Section 40460(b)-(c). SCAG is also designated under 42 U.S.C. '7504(a) as a ***Co-Lead Agency*** for air quality planning for the Central Coast and Southeast Desert Air Basin District.

SCAG is responsible under the Federal Clean Air Act for determining ***Conformity*** of Projects, Plans and Programs to the State Implementation Plan, pursuant to 42 U.S.C. '7506.

Pursuant to California Government Code Section 65089.2, SCAG is responsible for ***reviewing all Congestion Management Plans (CMPs) for consistency with regional transportation plans*** required by Section 65080 of the Government Code. SCAG must also evaluate the consistency and compatibility of such programs within the region.

SCAG is the authorized regional agency for ***Inter-Governmental Review*** of Programs proposed for federal financial assistance and direct development activities, pursuant to Presidential Executive Order 12,372 (replacing A-95 Review).

SCAG reviews, pursuant to Public Resources Code Sections 21083 and 21087, Environmental Impacts Reports of projects of regional significance for consistency with regional plans [California Environmental Quality Act Guidelines Sections 15206 and 15125(b)].

Pursuant to 33 U.S.C. '1288(a)(2) (Section 208 of the Federal Water Pollution Control Act), SCAG is the authorized ***Areawide Waste Treatment Management Planning Agency***.

SCAG is responsible for preparation of the ***Regional Housing Needs Assessment***, pursuant to California Government Code Section 65584(a).

SCAG is responsible (with the Association of Bay Area Governments, the Sacramento Area Council of Governments, and the Association of Monterey Bay Area Governments) for preparing the ***Southern California Hazardous Waste Management Plan*** pursuant to California Health and Safety Code Section 25135.3.

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C3. Letter from Southern California Association of Governments, dated January 22, 2007

Response 1

The comment provides background information and does not raise an environmental issue within the meaning of CEQA. The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not raise an environmental issue regarding the content of the Draft EIR, no further response is required. The County's public comment period exceeded the time requested by SCAG. For additional information regarding the length of the public comment period, please refer to **Topical Response 3**: Public Review Opportunities.

Response 2

The comment restates information contained in the Draft EIR, but does not raise an environmental issue within the meaning of CEQA. The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not raise an environmental issue regarding the content of the Draft EIR, no further response is required.

Response 3

The comment concurs that the proposed project is consistent with SCAG policy 3.01 as discussed in the Landmark Village Draft EIR, Section 2.0, Environmental and Regulatory Setting.

Also, for clarification purposes, the Landmark Village Draft EIR did not include a Population/Housing/Employment section in the document because the proposed project is consistent with the goals and objectives of the previously adopted Newhall Ranch Specific Plan approved by the Los Angeles County Board of Supervisors in May 2003.

Response 4

The comment concurs that the proposed project is consistent with SCAG policy 3.03 as discussed in the Landmark Village Draft EIR, Section 2.0, Environmental and Regulatory Setting. No further response is required given that the comment does not question the content of the Draft EIR.

Response 5

The comment concurs that the proposed project is consistent with SCAG policies 3.05, 3.09, and 3.10 as discussed in the Landmark Village Draft EIR, Section 2.0, Environmental and Regulatory Setting. No further response is required given that the comment does not question the content of the Draft EIR.

Response 6

The comment concurs that the proposed project is consistent with SCAG policies 3.12 and 3.14 as discussed in the Landmark Village Draft EIR, Section 2.0, Environmental and Regulatory Setting. No further response is required given that the comment does not question the content of the Draft EIR.

Response 7

The comment concurs that the proposed project is consistent with SCAG policies 3.17, 3.18, and 3.19 as discussed in the Landmark Village Draft EIR, Section 2.0, Environmental and Regulatory Setting. No further response is required given that the comment does not question the content of the Draft EIR.

Response 8

The comment requested a discussion outlining how the Landmark Village project supports or detracts from protecting wetlands, production lands, and lands containing unique and endangered plants and animals. In response, the Landmark Village project is part of the Newhall Ranch Specific Plan that was adopted by the Los Angeles County Board of Supervisors on May 27, 2003. While development was always anticipated over the Landmark Village site, significant portions of the Newhall Ranch Specific Plan site were designated for preservation. The Specific Plan establishes the regulations and standards for the protection of Open Areas adjacent to development and the two large River Corridor and High Country SMAs, totaling approximately 6,170 acres. While much of the Landmark Village site is proposed for development, site development was anticipated by the Land Use Map in the Newhall Ranch Specific Plan. While approving development over certain areas of the Newhall Ranch Specific Plan (including the Landmark Village site), the Los Angeles County Board of Supervisors acknowledged the impacts of development while also preserving vast areas in perpetuity, which protects wetlands and land containing unique and endangered plants and animals.

With regard to the preservation of production lands, neither the Landmark Village tract map site, utility corridor, borrow site, nor water tank sites are located in active mineral extraction operation areas. Further, the Landmark Village tract map site, utility corridor, borrow site, and water tank sites are not identified as a "locally-important mineral resource recovery site" or a "regionally significant construction aggregate resource area" by the County of Los Angeles General Plan, the Santa Clarita Valley Areawide

Plan, or the Newhall Ranch Specific Plan. In addition, at the time the Newhall Ranch site was designated by the County of Los Angeles as "Specific Plan," which serves as the zoning designation for the property, there were no areas within Newhall Ranch used for mineral extraction. Under the Specific Plan designation, the area currently is zoned for development of various Specific Plan land uses and not long-term mineral extraction activities.

The Specific Plan zoning designation allows for the development of a mixed-use planned community, with sand and gravel extraction activities allowed during tract grading and construction phases on the sites to be developed. Additionally, extraction activities are permitted in the Visitor-Serving (VS) and Open Area (OA) zones under a conditional use permit, which is not proposed. Thus, the current zoning designation for the entire Newhall Ranch site allows the area to be available for mineral extraction uses on a limited basis in areas that are already proposed for, and in association with, development (i.e., on tentative tract map sites). Furthermore, the majority of mineral resources of value are expected to be located in the River Corridor and not on the project site, and the continued availability of these resources would not be significantly affected by the proposed project.

Therefore, the Landmark Village site, as part of the Newhall Ranch Specific Plan, is considered consistent with SCAG policy 3.20.

Response 9

The comment concurs that the proposed project is consistent with SCAG policy 3.21 as discussed in the Landmark Village Draft EIR, Section 2.0, Environmental and Regulatory Setting. No further response is required given that the comment does not question the content of the Draft EIR.

Response 10

The comment concurs that the proposed project is consistent with SCAG policies 3.22 and 3.23 as discussed in the Landmark Village Draft EIR, Section 2.0, Environmental and Regulatory Setting. No further response is required given that the comment does not question the content of the Draft EIR.

Response 11

The comment concurs that the proposed project is consistent with SCAG policies 3.24 and 3.27 as discussed in the Landmark Village Draft EIR, Section 2.0, Environmental and Regulatory Setting. No further response is required given that the comment does not question the content of the Draft EIR.

Response 12

The comment concurs that the proposed project is consistent with SCAG policies 5.07 and 5.11 as discussed in the Landmark Village Draft EIR, Section 2.0, Environmental and Regulatory Setting. No further response is required given that the comment does not question the content of the Draft EIR.

Response 13

The comment concurs that the proposed project is consistent with SCAG policies 9.02 and 9.03 as discussed in the Landmark Village Draft EIR, Section 2.0, Environmental and Regulatory Setting. No further response is required given that the comment does not question the content of the Draft EIR.

Response 14

The comment concurs that the proposed project is consistent with SCAG policies 9.04 and 9.05 as discussed in the Landmark Village Draft EIR, Section 2.0, Environmental and Regulatory Setting. No further response is required given that the comment does not question the content of the Draft EIR.

Response 15

The comment concurs that the proposed project is consistent with SCAG policy 9.07 as discussed in the Landmark Village Draft EIR, Section 2.0, Environmental and Regulatory Setting. No further response is required given that the comment does not question the content of the Draft EIR.

Response 16

The comment concurs that the proposed project is consistent with SCAG policy 9.08 as discussed in the Landmark Village Draft EIR, Section 2.0, Environmental and Regulatory Setting. No further response is required given that the comment does not question the content of the Draft EIR.

Response 17

The comment concurs that the proposed project is consistent with the 2004 Regional Transportation Plan (RTP) as discussed in the Landmark Village Draft EIR, Section 2.0, Environmental and Regulatory Setting. No further response is required given that the comment does not question the content of the Draft EIR.

Response 18

The comment concurs that the proposed project is consistent with SCAG policy 9.08 as discussed in the Landmark Village Draft EIR, Section 2.0, Environmental and Regulatory Setting. No further response is required given that the comment does not question the content of the Draft EIR.

Response 19

The Landmark Village project promotes the four principles of SCAG's Compass Growth Visioning effort by improving mobility for all residents, fosters livability, enables prosperity for all people and promotes sustainability. There are many different components that make a community sustainable or qualify it as a smart growth project, which implement the principles of the Compass Growth Visioning effort. These include a proper mix of land use, provision of jobs, design for future transit uses in the plan, provision of open space and recreation, connectivity (trails), preservation of natural areas, the reduction of impermeable surfaces, water conservation and re-use, energy conservation, potentially including the use of alternative energies (wind, cogeneration, etc.), and the incorporation of green building techniques.

As is evidenced below, Landmark Village, as with all of Newhall Ranch, incorporates the components of a sustainable or smart growth community.

- **Mix of Land Uses.** Landmark Village, along with the other villages in Newhall Ranch, will include a broad range of housing types, including affordable housing, along with commercial, office, and public facilities. As to Landmark Village, a diverse range of 1,444 homes (308 single-family and 1,136 multi-family units) would be provided. To minimize and shorten vehicle trips, most homes will be within walking distances to the Landmark Village community's commercial and mixed-use areas, elementary school site, community park, and trail system. Finally, Landmark Village is located adjacent to the Valencia Commerce Center, one of the largest employment centers in the Santa Clarita Valley. Bike and pedestrian trails within Newhall Ranch and Landmark Village will connect to trails within the Valencia Commerce Center.

- **Provision of Jobs.** A portion of Newhall Ranch's projected 19,000 new jobs would be offered through Landmark Village's mixed-use and commercial areas. Newhall Ranch is adjacent to the existing Valencia Gateway (which includes the Valencia Commerce Center), which presently provides 50,000 jobs. Other development within Valencia Gateway will create an additional 30,000 jobs. When completed, the job centers in Newhall Ranch and Valencia will have resulted in the creation of approximately 100,000 jobs in the Santa Clarita Valley. A balanced jobs-housing base is a critical component to a sustainable community because it allows people to work close to home and minimizes vehicle miles traveled.

- **Locating of Residential Uses in Close Proximity to Commercial Services/Public Spaces.** Nearly 60 percent of the residential units in Newhall Ranch will be located within walking distance of village or commercial centers. This is clearly documented by the Landmark Village land plan. Residents within Landmark Village will be able to utilize paseos/trails and/or the Santa Clara River Regional Trail to walk to commercial centers, private recreational facilities, the elementary school and a community park. As stated above, this traditional neighborhood design minimizes vehicle trips.

- **Provision of Transit and Light Rail Right-of-Way.** Newhall Ranch, including Landmark Village, will be part of the Santa Clarita Transit system and will pay its fair share for transit service to the community. Transit improvements within Newhall Ranch will include a park-and-ride lot, a future

transit station, transfer station, bus stops, and preservation of light rail right-of-way. Landmark Village will include a total of five bus stops, a park-and-ride lot, and the preservation of light rail right-of-way along SR-126. The provision of transit and the accommodation of light rail encourage residents to rely less on vehicular travel.

- **Open Space, Recreation, and Preservation of Sensitive Resource Areas.** Newhall Ranch, of which Landmark Village is a part, includes the preservation of the High Country, Salt Creek Corridor and the Santa Clara River and internal open areas - a total of nearly 7,800 acres. A total of three community parks (Landmark includes the first) and up to ten neighborhood parks will be provided as part of Newhall Ranch. Finally, private recreation facilities will be provided throughout the entire Ranch providing additional recreational opportunities to residents. In short, Landmark Village's design connects jobs, retail, schools, parks, and recreation facilities with the community's trail system to promote walking and biking while minimizing vehicle trips.

- **Hierarchy of Trails.** Newhall Ranch will include over 50 miles of trails to encourage pedestrian mobility. Landmark Village includes a 2-mile extension of the Santa Clara River trail, with direct connections to residential, commercial, and park uses, and various paseos including the paseo running along "A" Street or the Landmark Village Spine Road. This design also is intended to minimize vehicle trips.

- **Reducing Impermeable Surfaces.** To curtail urban runoff and maximize groundwater recharge, Newhall Ranch, including Landmark Village, will utilize open/soft bottom channels, smaller street sections, where possible, increased native landscape areas, and non-structural water quality treatment improvements.

- **Water Conservation and Re-Use.** Newhall Ranch, including Landmark Village, will utilize native, drought-tolerant plants in the community's landscaping, use recycled water for irrigation, and evapotranspiration controllers (i.e., weather-sensitive sprinklers) to reduce potable water demand and runoff.

- **Traffic/Transportation Improvements.** Landmark Village's traffic circulation plan, which is consistent with all of Newhall Ranch, minimizes vehicle trips and reduces greenhouse gases (GHG) emissions through the design of internal roads in conjunction with homes, school site, commercial areas, and trail system. Transit is included in the traditional neighborhood design, and it includes a park-and-ride lot and bus stops. Additionally, a 5-mile right-of-way for a potential Metrolink light rail extension is accommodated along SR-126. Trails and bike paths leading to close-to-home jobs, neighborhood-serving retail, and the school encourage residents to reduce vehicle miles traveled. The applicant also has committed to fund $300 million in roadway improvements in the Santa Clarita Valley in conjunction with the Newhall Ranch Specific Plan, including Landmark Village, to improve traffic movement and circulation.

The project applicant also has prepared a "Sustainability Summary" for Landmark Village that identifies the above project design features and includes green building measures. This summary is found in **Appendix F** of this Final EIR.

Response 20

The comment addresses general subject areas, which received extensive analysis in the Draft EIR. The comment does not raise any specific issue regarding that analysis and, therefore, no more specific response can be provided or is required. However, the comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project.

Response 21

The comment provides factual information and does not raise an environmental issue within the meaning of CEQA. The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not raise an environmental issue regarding the content of the Draft EIR, no further response is required.

[TO BE RETYPED ON DISTRICT LETTERHEAD]

By Facsimile and First-Class Mail

January 22, 2007

Mr. Daniel Fierros
Department of Regional Planning
Room 1346
320 West Temple Street
Los Angeles, California 90012

Re: County Project No. 00-196-(5)
Vesting Tentative Tract Map. No. 53108
General, Local and Specific Plan Amendment Case Nos. 00-196-(5)

Dear Mr. Fierros:

This letter constitutes the Castaic Union School District's ("School District") comments to the Draft Environmental Impact Report associated with the above-referenced project The School District appreciates the opportunity to comment upon this matter. 1

THE PROJECT

In 1997, the Newhall Land and Farming Company ("NLF") was the owner of land within the County, and partially within the School District's boundaries, that NLF proposed for development into a new community known as Newhall Ranch. The entire developed was proposed to include approximately 24,000 residential units as well as commercial and industrial facilities. Total build out of the development was anticipated over 30 years.

The portion of the Newhall Ranch development that is within the School District's boundaries was known as Riverwood, consisting of approximately 2,333 acres. NLF's development plans for Riverwood include 2,338 single family and 1,686 multi-family dwelling units. Riverwood is further divided into several project areas, including, but not limited to, Landmark Village. The Landmark Village project area consists of 292.2 acres that NLF proposes to develop into 1,444 residential units (308 single family and 1,136 multi-family) with an anticipated residential population of 3,684. The Landmark Village project area also contemplates the inclusion of 1,033,000 square feet of commercial/mixed use space, a 9-acre elementary school site, a 16-acre community park, three private recreational facilities, open space and river trails, and supporting roadway, drainage and infrastructure improvements. 2

By the above-referenced application, NLF is seeking approval of the Landmark Village portion ("the Project") of the Riverwood development. The proposed 9-acre school site is included among the lots for which NLF seeks approval within the Landmark Village Vesting Tentative Tract Map. No. 53108.

THE 1997 FUNDING AGREEMENT

The School District and NLF entered into a "School Facilities Funding Agreement" dated November 20, 1997 ("Funding Agreement"). The intent of the parties was to reach agreement as to the manner in which the Newhall Ranch project's impact on the School District would be mitigated. In relevant summary, the Funding Agreement provides:

- NLF will provide a school site appropriate for an elementary (K-5) school designed to house 837 students on traditional single, track, 9 month schedule.
- The school site will be 10 acres, or 7 acres with a 5 acre adjoining park.
- The school site is subject to consent of the District and the California Department of Education ("CDE").
- The School District will construct the school on the school site in compliance with State requirements and specifications, including the then current State School Building Lease-Purchase Program Applicant Handbook.
- NLF will advance funds to the School District for construction of the school in response to District draw requests.
- NLF's per student contribution to construction costs will be ½ of the total costs per student. If state funds are not available for the construction, then NLF will be responsible for the full costs per student.
- NLF will provide funding to the School District to lease emergency relocatable classrooms to house up to 420 students generated by Riverwood until the completion of the school.
- If Riverwood generates more than 1,260 K-5 students, then NLF will provide another elementary school site.

There have been no significant amendments or modifications to the terms of the Funding Agreement since its original execution.

SUMMARY OF DRAFT EIR AND SCHOOL DISTRICT IMPACTS

NLF submitted the draft EIR presently under consideration in November 2006. The Draft EIR provides that the Project would generate 336 new elementary, 93 middle and 161 high school students at complete build out. (Draft EIR, 4.15.1.) With regard to mitigating the impact of the students generated by the Project, the draft EIR states:

2

> On November 20, 1997, the Castaic District entered into a school facilities/funding agreement with Newhall to ensure that development within the Riverwood Village of the Specific Plan, either individually or cumulatively with other projects within District's boundaries, would have no adverse impacts on the District's ability to provide adequate educational opportunities to every student in the District. In particular, the Financing Schedule and Financing Plan contained in the agreement guarantees to the Castaic District that there will be adequate school facilities available to house every student within the Specific Plan's Riverwood Village. The agreement states that the funds and land to be provided to the Castaic District by Newhall constitute the entire extent of Newhall's obligation to provide school facilities for the Specific Plan's Riverwood Village. (Draft EIR, 4.15-5.)

2

The draft EIR then restates the terms of the Funding Agreement with regard to the school site size and construction requirements. For example, the draft EIR provides that the school will be designed for a capacity of 837 students, based on traditional, single track, nine-month schedule school program. It states that the school will be constructed in accordance with the requirements of the specifications contained in the Education Code and the Applicant Handbook for State School Building Lease-Purchase Program as they exist at the time of construction.

The draft EIR acknowledges that the Project's "cumulative impacts on the School District would be significant" but concludes that "compliance with the funding agreement would reduce the cumulative impacts to below a level of significance."

AREAS OF CONCERN

The School District has three (3) areas of concern with regard to the draft EIR and proposed mitigation measures outlined in the EIR and the Funding Agreement: (1) the size of the proposed school site; (2) the location of the proposed school site; and (3) the measures available to address interim student housing needs pending completion of the proposed elementary school.

3

1. Site Size.

As outlined above, the Funding Agreement contemplates NLF providing a 10-acre site or, in the alternative, a 7-acre site with an adjoining 5-acre park. The Funding Agreement, however, also provides that the school site shall meet Education Code requirements and be subject to School District and California Department of Education approval.

4

With regard to the size of a traditional track, K-5 elementary school designed to house 750 students, the current proposed site is below the California Department of Education recommended minimum acreage. The District and NLF are in discussions to determine what measures, including any modification of the Funding Agreement, are necessary to obtain CDE site approval.

2. Site Location

The current proposed school site is abutted by California Highway route 126 to the north. California Code of Regulations, Title 5, section 14010(e) states, "The site shall not be adjacent to a road or freeway that any site-related traffic and sound level studies have determined will have safety problems or sound levels which adversely affect the educational program." 5

In addition to noise concerns, the site's proximity to Highway 126 raises potentially significant hazardous materials, air quality and other student safety issues. For example, in 2003, subsequent to the execution of the Funding Agreement, the Legislature required school districts to consider and evaluate the impact of freeways and other busy traffic corridors within one-fourth of a mile of a proposed school site that "might reasonably be anticipated to emit hazardous air emissions, or to handle hazardous or acutely hazardous materials, substances or waste." (See Education Code section 17213.) 6

The current proposed school site is well within one-fourth of a mile of the Highway 126. Moreover, the growth and expansion of the entire valley area and the cumulative impact of that expansion on the traffic flows along Highway 126 may impact the mitigation measures required to make the site suitable for school purposes. 7

3. Interim Student Housing

The Funding Agreement contemplates that construction of the new elementary school will not begin until the Riverwood project has reached a certain level of development. Specifically, the Funding Agreement states, "District shall provide NLF with written notice ("District Notice") for the New Elementary School when District reasonably determines that at least 420 Riverwod Students are estimated to exist within the next 30 months of the District Notice and that the New Elementary School is reasonably required to house Riverwood Students." NLF would then begin to provide construction funds in response to draw applications from the School District.

Until the completion of the new elementary school, the Funding Agreement provides for NLF to fund the lease of emergency relocatable buildings to house up to 420 Riverwood students. In addition to this relocatable building option, the School District contemplated using excess capacity in other School District schools to house such students. One of the alternative schools the School District contemplating using was scheduled for completion in 2007. However, the School District's facilities needs and plans have changed, and as a result, the School District no longer has plans to construct the alternative school. As a result, the School District is still exploring options for interim housing for Riverwood students consistent with School District facility, class size, and transportation targets and procedures. 8

Finally, the School District notes that the California Department of Education has performed a preliminary evaluation of the current proposed site. The evaluation noted the size and location concerns discussed above. The report concluded that the School

District could proceed with further evaluation of the site. However, the report was inconclusive as to whether the site would receive CDE approval and as to exactly what mitigation measures may need to be taken to make the site suitable. 8

CONCLUSION

The School District believes that the Funding Agreement is a positive and substantial step in the joint effort with NLF to mitigate the Project's impacts on the School District. It provides a workable framework for the School District and NLF to move forward. However, as discussed above, several issues remain with regard to the practical implementation of the Funding Agreement to ensure the Project's impacts are adequately and appropriately addressed. 9

The School District looks forward to continuing its positive partnership with NLF to resolve these remaining issues. Nevertheless, the School District believes there is important work still to be done in this regard.

The School District once again thanks the County for the opportunity to comment upon this matter and hopes that these comments are helpful in the County's evaluation of the Project.

If you should have any questions regarding these comments or desire further information from the School District, please do not hesitate to contact me. 10

Sincerely,

Jaime Garcia

cc: Glenn Adamick, The Newhall Land and Farming Company
bc: Trevin E. Sims

s0066559

C4. Letter from Castaic Union School District, dated January 22, 2007

Response 1

This comment is an introduction to comments that follow. No further response is required.

Response 2

The comment restates information contained in the Draft EIR, but does not raise an environmental issue within the meaning of CEQA. The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not raise an environmental issue regarding the content of the Draft EIR, no further response is required.

Response 3

The comment summarizes the Castaic Union School District's three areas of concern with regard to the Landmark Village Draft EIR. Those concerns are addressed in **Responses 4** through **8**, below.

Response 4

As stated in the comment, the project applicant is currently working with the Castaic Union School District to provide a school site that will meet State of California and District acreage requirements pursuant to the Castaic/Newhall Funding Agreement.

Response 5

In response to working with the Castaic Union School District and California Code of Regulations, Title 5, section 14010(e), the project applicant has redesigned the park and school configuration, placing the park adjacent to SR-126 and the school adjacent to "A" Street. The school site is no longer adjacent to SR-126 and does not have any site-related traffic, noise, or other issues that would impact educational programs. The project applicant is continuing to work with the Castaic Union School District to finalize the site plan for the school site.

Response 6

Please see **Response 5**, above, with respect to the school site location in proximity to SR-126.

Response 7

Please see **Response 5**, above, with respect to the school site location in proximity to SR-126.

Response 8

The project applicant is currently working with the Castaic Union School District to provide temporary school facilities necessary to accommodate and provide interim housing for up to 420 school students prior to construction of permanent facilities within Landmark Village.

Response 9

The comment expresses the opinions of the Castaic Union School District. The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not address or question the content of the Draft EIR, no further response is required.

Response 10

The comment is noted. No further response is required given that the comment does not address or question the content of the Draft EIR.

Letter No. C5

City of
SANTA CLARITA

23920 Valencia Blvd.
Suite 300
Santa Clarita
California 91355-2196
Website: www.santa-clarita.com

Phone
(661) 259-2489
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February 5, 2007

Mr. Daniel Fierros
Los Angeles County Regional Planning
320 West Temple Street
Los Angeles, CA 90012

Subject: DRAFT EIR FOR COUNTY PROJECT NO. 00-196;
LANDMARK VILLAGE
SCH# 2004021002

Dear Mr. Fierros:

Thank you for the opportunity to review the Draft EIR for the proposed Landmark Village project. As this project represents the first phase of the adopted Newhall Ranch Specific Plan, its review is of particular significance in that it will likely set precedence for future phases of this 21,000+ unit community located in the westerly portion of the Santa Clarita Valley. In this regard, the City of Santa Clarita offers the following comments on the Draft EIR: 1

Transit

The Mobility Plan evaluated as a part of the Newhall Ranch Final EIR is intended to facilitate public transit, thereby reducing traffic and air quality impacts. Improvements identified in that plan may include a system of bicycle trails, bus pull-ins, and park and ride facilities, as well as a possible future Metrolink line and train station. The Specific Plan states that a transit corridor will be reserved along the south side of Hwy. 126 as a part of this project that would permit transit/rail opportunities. 2

Mitigation Measure SP 4.8-5 of the DEIR for Landmark Village requires consultation with the local transit operator, Santa Clarita Transit, to determine the need for and location of bus pull-ins on streets within the Specific Plan. The DEIR does not address whether consultation occurred or whether street improvement plans approved as a part of VTTM 53108 will address bus pull-ins or other transit-related improvements as envisioned under the Newhall Ranch Specific Plan.

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Jobs/Housing Balance

The adopted Newhall Ranch Specific Plan anticipates development of over 21,000 new residential units and 350 acres of new retail, office, business park and visitor serving commercial uses. In this regard, an analysis of the relationship between potential job opportunities and the number of housing units was evaluated as a part of the Specific Plan. Jobs-housing balance is an important part of land use planning. The impacts of development of Landmark Village on the jobs-housing balance for the Santa Clarita Valley are also relative to the discussion of traffic impacts. Section 3.0 of the Draft EIR states that the project's cumulative impact on population, housing and employment is addressed in the EIR; however, neither these topics nor has the issue of jobs-housing balance has been evaluated. 3

As referenced in Appendix 7.2 of the Newhall Ranch Specific Plan, the 2002 Santa Clarita Valley Consolidated Traffic Model indicates that at buildout the County and City General Plans would produce an estimated 1.43 jobs per household. However, according to a 2005 Santa Clarita Labor Market Study prepared for the City of Santa Clarita by Alfred Gobar Associates, the jobs-housing ratio in the Santa Clarita area was estimated at approximately 1.04 jobs per household, which is approximately 25% lower that the Traffic Model indicates and 17% lower than the 1.36 jobs per household in the Southern California region as a whole. According to the Gobar study, 53% of workers commute outside of the Santa Clarita Valley, which clearly demonstrates a need to increase the Valley's job base. It should be noted that the Consolidated Traffic Model will be updated as a part of the ongoing joint City/County "One Valley One Vision" (OVOV) General Plan Update. 4

The Southern California Association of Government's (SCAG) Regional Transportation Plan identifies the Santa Clarita Valley as becoming a "housing-rich" area. As shown in Table 1, SCAG's latest Integrated Growth Forecast projects the jobs-housing balance for both the City of Santa Clarita and the Los Angeles County unincorporated area as getting worse over time instead of better. For example, the City's job-housing ratio is anticipated to decrease from 1.01 jobs per household in 2005 down to .76 jobs per household in 2030. This represents a 25% decrease. In the unincorporated County area, which includes the Newhall Ranch project, only .72 jobs per household are projected for the year 2030. 5

Table 1. Ratio of Jobs to Households based on SCAG's Integrated Growth Forecast

	2005	2010	2020	2030	Change
City of Santa Clarita	1.01	1.05	1.08	.76	.25
Unincorporated L.A. County[1]	.88	.82	.71	.72	.16
Average:	.95	.94	.90	.74	.21

[1] Includes portions of unincorporated L.A. County in the Antelope Valley.

As people continue to migrate and immigrate to the Valley, both the City of Santa Clarita and the County of Los Angeles need to find ways to improve the jobs-housing ratio. This has been identified as an issue to be addressed in the ongoing joint City/County "One Valley One Vision" (OVOV) General Plan Update. Studying land use patterns that encourage jobs-housing balance is one strategy that can be used; however, until the OVOV Land Use Plan and strong jobs-housing balance policies are adopted, it is important that policy makers find ways to improve the current downward trend in jobs-housing balance in the Santa Clarita Valley. 6

Thank you for your consideration in this matter. 7

Sincerely,

Paul D. Brotzman
Director of Community Development

PDB:SS:lep
PB:SS:s:\cd\current countymonitoring-newhallranch landmarkvillagedeir

cc: Glenn Adamick, Newhall Land
Bruce McClendon, Director, Los Angeles County Regional Planning
Jeff O'Keefe, Transit Manager, City of Santa Clarita

C5. Letter from City of Santa Clarita, dated February 5, 2007

Response 1

This comment is an introduction to comments that follow. No further response is required.

Response 2

The comment questions if the project applicant had consulted with Santa Clarita Transit regarding bus pull-ins or other transit-related improvements. The project applicant has consulted with Santa Clarita Transit to discuss necessary transit improvements. The transit-related improvements are shown on VTTM 53108.

Response 3

The comment states that the issues of population/housing/employment, including jobs/housing balance, was not evaluated in the Landmark Village Draft EIR. The Newhall Ranch Specific Plan Program EIR addressed the issue of population/housing employment. With respect to jobs/housing balance, the Newhall Ranch Specific Plan Program EIR concluded that the Regional Comprehensive Plan and Guide (RCPG) ratio target of 1.30 jobs per housing units, and the Santa Clarita Valley cumulative build-out would represent a jobs/housing balance ratio of 1.30, which is identical to the RCPG. Given that the Landmark Village project is consistent with the Newhall Ranch Specific Plan, the County of Los Angeles determined that a population/housing/employment analysis was not required for the Landmark Village Draft EIR.

With that said, the Landmark Village project incorporates the following characteristics, which address important jobs/housing issues:

- **Mix of Land Uses.** Landmark Village, along with the other villages in Newhall Ranch, will include a broad range of housing types, including affordable housing, along with commercial, office, and public facilities. As to Landmark Village, a diverse range of 1,444 homes (308 single-family and 1,136 multi-family units) would be provided. To minimize and shorten vehicle trips, most homes will be within walking distances to the Landmark Village community's commercial and mixed-use areas, elementary school site, community park, and trail system. Finally, Landmark Village is located adjacent to the Valencia Commerce Center, one of the largest employment centers in the Santa Clarita Valley. Bike and pedestrian trails within Newhall Ranch and Landmark Village will connect to trails within the Valencia Commerce Center.

- **Provision of Jobs.** A portion of Newhall Ranch's projected 19,000 new jobs would be offered through Landmark Village's mixed-use and commercial areas. Newhall Ranch is adjacent to the existing Valencia Gateway (which includes the Valencia Commerce Center), which presently provides 50,000 jobs. Other development within Valencia Gateway will create an additional 30,000

jobs. When completed, the job centers in Newhall Ranch and Valencia will have resulted in the creation of approximately 100,000 jobs in the Santa Clarita Valley. A balanced jobs-housing base is a critical component to a sustainable community because it allows people to work close to home and minimizes vehicle miles traveled.

- **Locating of Residential Uses in Close Proximity to Commercial Services/Public Spaces.** Nearly 60 percent of the residential units in Newhall Ranch will be located within walking distance of village or commercial centers. This is clearly documented by the Landmark Village land plan. Residents within Landmark Village will be able to utilize paseos/trails and/or the Santa Clara River Regional Trail to walk to commercial centers, private recreational facilities, the elementary school and a community park. As stated above, this traditional neighborhood design minimizes vehicle trips.

- **Provision of Transit and Light Rail Right-of-Way.** Newhall Ranch, including Landmark Village, will be part of the Santa Clarita Transit system and will pay its fair share for transit service to the community. Transit improvements within Newhall Ranch will include a park-and-ride lot, a future transit station, transfer station, bus stops, and preservation of light rail right-of-way. Landmark Village will include a total of five bus stops, a park-and-ride lot, and the preservation of light rail right-of-way along SR-126. The provision of transit and the accommodation of light rail encourage residents to rely less on vehicular travel.

- **Traffic/Transportation Improvements.** Landmark Village's traffic circulation plan, which is consistent with all of Newhall Ranch, minimizes vehicle trips and reduces GHG emissions through the design of internal roads in conjunction with homes, school site, commercial areas, and trail system. Transit is included in the traditional neighborhood design, and it includes a park-and-ride lot and bus stops. Additionally, a 5-mile right-of-way for a potential Metrolink light rail extension is accommodated along SR-126. Trails and bike paths leading to close-to-home jobs, neighborhood-serving retail, and the school encourage residents to reduce vehicle miles traveled. The applicant also has committed to fund $300 million in roadway improvements in the Santa Clarita Valley in conjunction with the Newhall Ranch Specific Plan, including Landmark Village, to improve traffic movement and circulation.

As discussed above, the Landmark Village project incorporates housing, employment opportunities, and transit in close proximity to major employment centers that further the jobs/housing balance in the Santa Clarita Valley.

Response 4

The comment states that recent studies (Gobar 2005) indicate 1.04 jobs per household in the Santa Clarita area when compared to the figures provided in the Newhall Ranch Specific Plan, which indicated 1.43 jobs per household at build-out of the County and City General Plans, and a 1.36 jobs per household figure for the southern California region as a whole. Additionally, the Gobar study estimated that 53 percent of commuters work outside of the Santa Clarita Valley, demonstrating a need to increase the Valley's job base. The project applicant, when combining the Valencia and Newhall Ranch Specific Plan developments, will provide approximately 50,000 homes and 100,000 jobs resulting in a 2.0 jobs per

household ratio in the Santa Clarita Valley. As indicated above, the applicant is providing its fair share of employment opportunities for the Santa Clarita Valley.

Response 5

Please see **Response 4**, above.

Response 6

Please see **Response 4**, above.

Response 7

The comment is noted. No further response is required given that the comment does not address or question the content of the Draft EIR.

Letter No. C6

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Legal Counsel
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General Manager
Dana L. Wischart

UNITED WATER CONSERVATION DISTRICT

"Conserving Water Since 1927"

REC
ENV-8

February 7, 2007

Susie Tae
Los Angeles County Department of Regional Planning
320 West Temple Street
Los Angeles, CA 90012

Dear Ms. Tae,

The United Water Conservation District has reviewed the Landmark Village Draft EIR and finds that it complies with the terms established in our settlement agreement with Newhall Land.

Through the MOU process that was established pursuant to our settlement agreement with Newhall Land and the County of L.A., we have established an avenue of communication that gives United Water Conservation District a high level of trust in Newhall Land's desire to protect water resources as they develop the Newhall Ranch Project. 1

We don't have any additional comments at this time and look forward to working with Newhall Land as well as the water purveyors in the Upper Santa Clara River Watershed.

Sincerely,

Dana L. Wischart

Dana L. Wischart
General Manager

cc: Glenn Adamick, Newhall Land
Robert DiPrimio, Valencia Water Co.

File: Newhall Land
Cross Reference: Upper River MOU
J:\ADMIN\Correspondence\2007 General Correspondence\Landmark Village Letter.doc

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C6. Letter from United Water Conservation District, dated February 7, 2007

Response 1

The County appreciates United Water Conservation District's thorough review of the Landmark Village Draft EIR. The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not raise an environmental issue regarding the content of the Draft EIR, no further response is required.

Fierros, Daniel

From: April Jacobs (CLWA) [ajacobs@clwa.org]
Sent: Tuesday, February 20, 2007 11:11 AM
To: Fierros, Daniel
Cc: Jeff B. Herbert; Michael Hurley; Valerie Pryor; Russell G. Behrens; Betsy Martyn; Gerrie Goodreau
Attachments: Comment Letter.pdf

ENV-22

Attached is a comment letter on Landmark Village Draft Environmental Impact Report to be included in the record and in the case file for the Regional Planning Commission Hearing on February 28, 2007. 1

Please note the original comment letter to be delivered via courier today. Thank you.

April Jacobs
Board Secretary
Castaic Lake Water Agency
27234 Bouquet Canyon Road
Santa Clarita, CA 91350
(661) 297-1600 - Main Line
(661) 297-1610 - Fax
(661) 513-1238 - Direct Line
E-mail Address: ajacobs@clwa.org

2/21/2007

C7. Letter from Castaic Lake Water Agency, dated February 20, 2007

Response 1

This comment is an introduction to comments that follow. No further response is required.

Letter No. C8

CASTAIC LAKE WATER AGENCY

February 20, 2007

Mr. Daniel Fierros
Los Angeles County
Department of Regional Planning
320 West Temple Street
Los Angeles, CA 90012

Dear Mr. Fierros:

The Castaic Lake Water Agency (CLWA) has reviewed the Draft Environmental Impact Report for Landmark Village (SCH No. 2004021002) (Draft EIR) and submits the following comments:

1. WATER SERVICE IMPACTS (Section 4.10)

The discussion of Water Service in the Draft EIR requires amplification and further review for the following reasons:

The Newhall Ranch Specific Plan Program EIR (March 1999) indicated that, in addition to the use of local groundwater and recycled water, imported State Water Project (SWP) and other water would be used at the buildout of the Specific Plan in dry and normal hydrologic years. Subsequently, the Newhall Ranch Specific Plan and Water Reclamation Plant Revised Additional Analysis (March 2003) (Additional Analysis) further identified the need for imported supplies for reliability purposes and identified specific supplies intended to meet the water needs of the Newhall Ranch development including: 1) supplies acquired by Newhall Land and Farming and 2) additional SWP supplies (Additional Analysis, Executive Summary, page 11). In contrast, the Draft EIR states that the Landmark Village portion of the Newhall Ranch Specific Plan will not require imported water but does not discuss this change relative to the Specific Plan or the Additional Analysis.

The various imported water supplies would need to be delivered through SWP facilities controlled by the California Department of Water Resources (DWR) and treatment and conveyance facilities controlled by CLWA. The Draft EIR should be amplified in this regard. CLWA confirms that to the extent imported water is required for the project, it is available from CLWA.

1

2

3

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website address www.clwa.org

Thank you for your consideration of these comments. If you have questions, please contact Jeff Ford, Water Resources Planner at (661) 513-1281. 4

Sincerely,

Valerie L. Pryor
Administrative Services Manager

cc: Michael Hurley, Water Resources Manager
Jeff Ford, Water Resources Planner

C8. Letter from Castaic Lake Water Agency, dated February 20, 2007

Response 1

This comment is an introduction to comments that follow. No further response is required.

Response 2

The comment from Castaic Lake Water Agency (CLWA) requests amplification of the prior Newhall Ranch environmental documentation and the Landmark Village Draft EIR in terms of the use of imported SWP supplies for the Newhall Ranch Specific Plan. The requested amplification/clarification is provided below.

First, the comment references the Newhall Ranch Revised Draft EIR (March 1999) and then the subsequent Newhall Ranch Revised Additional Analysis (May 2003). This reference indicates that there were two separate water resource sections in the two documents. While the Newhall Ranch Revised Draft EIR (March 1999), Section 4.11, contained a separate section addressing water resources, that section was revised and completely replaced and superceded by the water resources section found in the Revised Additional Analysis (May 2003), Section 2.5. Revised Section 2.5 concluded, based on substantial evidence, that an adequate supply of water is available to meet the demand of the Newhall Ranch Specific Plan without causing significant environmental impacts.[1] This section also provided a detailed "overview" of the Specific Plan's revised water supply and demand analysis, which is repeated below in order to provide further amplification/clarification of the water supplies relied upon by the Newhall Ranch Specific Plan:

> "The County of Los Angeles and the Newhall Ranch applicant are responding to the trial court's decision and direction to demonstrate availability of identified water supplies by now relying on its own primary sources of water supply. The first source is the applicant's historical alluvial groundwater produced in the County of Los Angeles that is presently committed to agriculture uses. The second source is the applicant's purchase of water from Nickel Family LLC in Kern County (the "Nickel Water"). Because these two independent primary water sources meet the potable water needs of the Specific Plan, no potable water would be needed from State Water Project (SWP) and Castaic Lake Water Agency (CLWA) supplies.
>
> The applicant's right to the beneficial use of its agricultural water resources is well established under California law. [Footnote omitted.] This agricultural water will be available for agricultural production until it is phased out by urban development. There would be a limit placed on the amount of groundwater converted to urban uses so that it

[1] The Newhall Ranch Revised Additional Analysis (May 2003) already has been incorporated by reference in the Landmark Village EIR. See, Landmark Village Draft EIR, Introduction, pp. I-9–I-11.

> will not exceed the amount already used for agricultural purposes. This agricultural water supply has historical long-term availability and reliability, and is an established supply. This agricultural water supply will provide approximately 81 percent of the Specific Plan's potable water need. The Alluvial aquifer has consistently been at or near its highest level and is not in an overdraft condition.
>
> The Nickel Water consists of 1,607 acre-feet per year (AFY) of water purchased by the applicant from Nickel Family LLC. This water is 100 percent reliable on a year-to-year basis, and not subject to the annual fluctuations that can occur in dry year conditions. Pursuant to Nickel's contract water rights, the water delivered to Nickel for sale to Newhall must be high quality water, acceptable for delivery into the California aqueduct. In addition, delivery of the water to Nickel being sold to Newhall is mandatory, unaffected by annual hydrologic conditions. Consequently, the Nickel Water is not subject to unpredictable reductions in quality or quantity typical of other water sources. These characteristics make the Nickel Water a dependable water supply source. See, Section 2.5.5.3, Newhall Ranch Water Supplies, for additional information. The water would be delivered through the Kern County Water Agency and the State Water Project (SWP) system. The Nickel Water would only be needed on the Specific Plan site in years when all of the Newhall Agricultural Water has been used, which is estimated to occur after the 20th year of project construction. Up to that point in time, the unused Nickel Water would be available for storage in groundwater banking programs on an annual basis, which would then be used as a dry year supplemental supply. These two sources of supply would balance the Newhall Ranch Specific Plan potable water demand in normal/average years. The non-potable demand would be met by the use of reclaimed water supplied by the Newhall Ranch water reclamation plant (WRP) and reclaimed water that will be supplied by CLWA." (Newhall Ranch Revised Additional Analysis, Volume VIII, Section 2.5, Water Resources, pp. 2.5-2–2.5-3 (May 2003.)

As summarized above, there are sufficient water supplies to meet the Newhall Ranch Specific Plan demand, including the Landmark Village project.

The Landmark Village Draft EIR, Section 4.10, Water Service, is consistent with the water supply analysis provided in the previously certified Newhall Ranch Revised Additional Analysis (May 2003). To illustrate this point, the Draft EIR included the following "summary" of the Landmark Village project's water demand and supplies, which correctly included the statement that imported water from CLWA's SWP supplies would not be needed to serve the Landmark Village project (the first phase of the Newhall Ranch Specific Plan):

> "The proposed Landmark Village project would generate a total water demand of 1,038 acre-feet per year (afy) [footnote omitted], 702 afy of potable water demand, and 336 afy of non-potable demand. Potable water demand (702 afy) would be met by the Valencia Water Company through the use of the project applicant's rights to 7,038 afy of groundwater from the Alluvial aquifer, which is presently used by the applicant for agricultural irrigation. Because this water is already used to support the applicant's existing agricultural uses, there is not expected to be any significant environmental

> effects resulting from the use of such water to meet the potable demands of the Landmark Village project, which is part of the approved Newhall Ranch Specific Plan area. In addition, due to project conditions, the amount of groundwater that will be used to meet the potable demands of the Newhall Ranch Specific Plan, including the Landmark Village project, cannot exceed the amount of water historically and presently used by the applicant for agricultural uses. Therefore, no net increase in groundwater use will occur with implementation of this project pursuant to the Specific Plan.
>
> Non-potable water demand (336 afy) would be met through the use of recycled (reclaimed) water from the initial phase of the Newhall Ranch Water Reclamation Plant (WRP), with build-out of the WRP occurring over time as demand for treatment increases with implementation of the Newhall Ranch Specific Plan. Alternatively, if the Newhall Ranch WRP is not operating at the time of project occupancy, the non-potable water demand would be met through the use of recycled water from the existing Valencia WRP, located upstream of the Landmark Village project site.
>
> Accordingly, the proposed project's water demand would be met by relying on two primary sources of water supply, namely, the applicant's agricultural water supplies and recycled water supplied by the Newhall Ranch WRP or the existing Valencia WRP. *Because these two independent water sources meet the water needs of the proposed project, no potable water would be needed from the existing or planned water supplies of Castaic Lake Water Agency (CLWA), including imported water from CLWA's State Water Project (SWP) supplies.* Nonetheless, CLWA's water supplies, including imported water from the SWP, are assessed in this EIR for informational purposes." (Landmark Village Draft EIR, Volume II, Section 4.10, Water Service, p. 4.10-1; italics added.)

As summarized above, the Landmark Village project does not rely on SWP supplies. As such, there has been no change relative to the Specific Plan's water supplies between the Landmark Village Draft EIR and the previously certified Newhall Ranch Revised Additional Analysis (May 2003).

Response 3

CLWA correctly points out that various imported SWP supplies would need to be delivered through SWP facilities controlled by the California Department of Water Resources and treatment and conveyance facilities controlled by CLWA.

Response 4

The comment is noted. No further response is required given that the comment does not address or question the content of the Draft EIR.

Letter No. C9

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Daniel C. Naumann
F.W. Richardson

Legal Counsel
Philip C. Drescher

General Manager
Dana L. Wachan

UNITED WATER CONSERVATION DISTRICT

"Conserving Water Since 1927"

February 20, 2007

Mr. Daniel Fierros
Department of Regional Planning
County of Los Angeles
320 West Temple Street
Los Angeles, CA 90012

Reference: Draft Environmental Impact Report – Landmark Village (SCH No. 2004021002)

Dear Mr. Fierros,

United Water Conservation District has reviewed the Draft Environmental Impact Report (DEIR) for the Landmark Village Development. Reviewing the voluminous DEIR with all the attached technical appendixes pertaining to hydrology, water supply/water use, and waste water is truly challenging but, the volume reflects the considerable amount of information amassed since submittal of the original EIR for the Newhall Ranch Specific Plan in the 1990s. Ventura County water users as well as Los Angeles County water users are clearly much better served by the DEIR for the Landmark Village Project than the original EIR for the Newhall Ranch Specific Plan. United Water has only a few comments and a couple of recommendations. 1

United notes a number of inconsistencies or errors related to chloride discharges associated with the Landmark Village development. Chloride TMDL development is currently in progress for Reach 5 and 6 of the Santa Clara River and not in "downstream reaches" as suggested in the document. 2 Annual surface water chloride load from the proposed development is repeatedly listed in section 4.3 as 6 pounds of total load, while Geosyntec's actual estimate is six *tons* of chloride. 3 Section 4.3 also significantly underreports discharges from the Valencia water reclamation plant, and is not consistent with the plant discharges reported in Section 4.11. 4 The chloride influence of small local tributaries such as Potrero Canyon and San Martinez Canyon appear to be overstated, while the influence of upstream wastewater discharges is not specifically addressed. 5 United Water wonders why the wet weather chloride value of 61 mg/l at USGS station 11108500 (shown in Table 4.3-7) is doubled to a value of 122 mg/l when discussed in the text. 6 Chloride pollution in the Santa Clara River is a concern of water users in Ventura County, and the errors and lack of clarity of the chloride discussions in section 4.3 do not allow for an accurate evaluation of potential impacts. 7

United seeks assurances that there is a long-term commitment to the repair and maintenance of the numerous storm water treatment and retention mechanisms detailed in the draft EIR. We 8

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applaud the use of these innovative technologies but recognize the long-term need to maintain these facilities to keep them functioning efficiently and as designed. The routine and storm-event maintenance and repairs of BMPs mentioned in construction-related impacts must also be included for the storm water BMPs serving the developed community. 8

The Landmark Village Development DEIR states that 702 afy of potable water and 336 afy of non-potable recycled water will be needed for the development. The 702 afy year of additional water demand on the local water supply represents only 1% and 2.3% of the Castaic Lake Water Agency's and Valencia Water Company's respective 2005 municipal demand. Even if the entire 702 afy of additional water demand were pumped from groundwater it is highly unlikely that this would create overdraft in the Eastern Basin. Recent groundwater pumping within the basin has been approximately 45,000 afy, and neither the Alluvial nor Saugus aquifers show any indication of overdraft. In addition, if the municipal and industrial pumping for the Landmark Village Project simply offsets agricultural pumping by Newhall Ranch Farming along this reach of the river, there is no apparent reason why surface water flow at the Ventura County line would be impacted. 9

Although United Water does not believe the Landmark Village Project by it self would result in the overdraft of the Eastern Basin or impact flows at the Ventura County line, it is important to remember that this is only the first phase of a much larger build-out of the Newhall Ranch Community. The Newhall Ranch Specific Plan identified four primary sources of supply for the overall Newhall Ranch Community: (1) Newhall Ranch agricultural pumped groundwater; (2) recycled water; (3) imported George Nickel Enterprise water from Kern County; and (4) banked SWP water in the Semitropic Water Storage District. Although a number sources for meeting water supply for the overall Newhall Ranch Community have been identified, from a broader perspective the cumulative impact of the full built-out of Newhall Ranch and the overall increased pumping demands elsewhere within the Eastern Basin may present challenges to water managers in both Los Angeles and Ventura County not fully anticipated at this time. Therefore enhanced monitoring of the groundwater and surface water conditions is essential. 10

Since 2001, United Water has been working with the Santa Clara Valley Upper Basin Water Purveyors to take a cooperative approach to solving regional groundwater management issues. United Water strongly endorses the considerable effort made by the Water Purveyors with respect to increasing their surface water supply and conducting technical analyses to assure their ability to increase groundwater production without negative impacts. The development of the Regional Groundwater Model for the Santa Clarita Valley was the most important technical improvement for addressing the potential impacts associated with various scenarios of increased pumping and aquifer storage recovery projects. United Water is especially comfortable with the CH2M Hill modeler, who created the regional model. John Porcello and his team of modelers at CH2M Hill have also worked with the updated calibration of the Ventura County Groundwater Model. United Water uses groundwater modeling extensively to evaluate the effectiveness of 11

UNITED WATER CONSERVATION DISTRICT

various conjunctive use projects and groundwater management strategies. Although staff uses modeling extensively, it also depends on groundwater monitoring as a means to measure both the effectiveness of a project or management strategy and the validity of the model projections. While United Water endorses the Regional Groundwater Model for the Santa Clarita Valley, it highly recommends detailed monitoring of groundwater and surface water for evaluating the validity of the model and more importantly to gauge the health of the Eastern Basin and surface water flow and water quality at the Ventura County line. 11

United Water recommends that since the Landmark Village Project is the first phase of a total build-out of the overall Newhall Ranch Community that the Santa Clara River Valley Upper Basin Water Purveyors and United Water work together to assure that there is adequate monitoring of groundwater levels, groundwater quality, surface water flow, and surface water quality adjacent to and downstream of the Landmark Village Project and the future build-out of the Newhall Ranch Community. 12

If you have any questions please contact either Ken Turner or Dr. Steve Bachman at (805) 525-4431, or alternatively at kent@unitedwater.org or Steveb@unitedwater.org respectively. 13

Sincerely,

Dana L. Wisehart
General Manager

CC: BDRF
Jeff Pratt

C9. Letter from United Water Conservation District, dated February 20, 2007

Response 1

The comment expresses the opinions of the United Water Conservation District. The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not address or question the content of the Draft EIR, no further response is required.

Response 2

As stated in the Draft EIR, Section 4.3(4)(a)(1)(a), the project is located near Reach 5 of the Santa Clara River. The LARWQCB adopted a TMDL to address chloride impairments of the Upper Santa Clara River on July 10, 2003 (Resolution 03-008). The Draft EIR, Section 4.3(4)(a)(1)(a), states that chloride TMDLs have been adopted into the Basin Plan and summarizes the TMDL waste load allocations for MS4 and stormwater sources to Santa Clara River Reach 5 in Board Resolution No. 03-008 (Table 4.3-2). On May 6, 2004, the Regional Board amended the Upper Santa Clara River chloride TMDL to revise the interim waste load allocations (WLAs) for the Saugus and Valencia Water Reclamation Plants and the implementation schedule (Resolution 04-004). The amended TMDL was approved by the State Water Resources Control Board (State Board), Office of Administrative Law (OAL) and United States Environmental Protection Agency (USEPA), and became effective on May 5, 2005. Resolution 06-016, dated August 3, 2006, revised the TMDL Implementation Plan schedule.

Based on the chloride impairment and TMDL for Reach 5, chloride was chosen and analyzed as a pollutant of concern for purposes of determining the significance of water quality impacts. (Draft EIR, Section 4.3(5)(a).) The impacts analysis, which included evaluation of estimates of post-development chloride loads and concentrations derived from modeling, concluded that project water quality impacts related to chloride would be less than significant.

Response 3

The comment is correct. This was a typographical error in the *Landmark Village Water Quality Technical Report* (Appendix 4.3) that was carried into the Landmark Village Draft EIR, Section 4.3, Water Quality. The correct unit for chloride load is tons, not pounds. This typographical error does not affect the analysis, nor the conclusion reached with respect to the project's impacts on chloride concentrations, specifically, or water quality impacts in general.

Response 4

The Saugus WRP has a permitted dry weather average design capacity of 6.5 million gallons per day (mgd), and the Valencia WRP has a permitted dry weather average design capacity of 21.6 mgd. The existing combined permitted treatment capacity of the Santa Clara Valley Sanitation District for the Saugus and Valencia WRPs is 28.1 mgd and the combined average treated discharge from January 2004 through June 2007 was approximately 19.9 mgd. Section 4.11 of the Landmark Village Draft EIR will be modified to reflect the above information.

Response 5

The *existing* wet and dry weather surface water quality data for receiving waters in the project area included in the Landmark Village Draft EIR are available in-stream existing condition water quality monitoring data. The purpose of this data analysis was to summarize existing water quality to characterize the existing condition for CEQA purposes, and for comparison with predicted, modeled stormwater runoff from the project area (i.e., wet weather data). The USGS monitoring station and the two Newhall Ranch WRP start-up monitoring stations within the Santa Clara River reflect the influence of both the tributaries within the Newhall Ranch Specific Plan area, and the upstream wastewater discharges. The chloride monitoring data for Potrero Canyon and San Martinez Canyon, as well as for the Santa Clara River, were reported for purposes of determining the existing water quality conditions.

Response 6

The 122 mg/L value that was used in the text discussion is a typographical error, as this was the average chloride value observed in dry weather flows at the USGS station. The average wet weather chloride value listed in Table 4.3-7 (61 mg/L) is the correct value. This typographical error does not affect the analysis, nor the conclusion reached with respect to the project's impacts on chloride concentrations specifically, or water quality impacts in general.

Response 7

The Landmark Village Draft EIR, Section 4.3, Water Quality, and Appendix 4.3, the Landmark Village Water Quality Technical Report, address potential impacts to chloride in the Santa Clara River accurately and with sufficient clarity. The minor typographical errors in the text noted above do not impact the Draft EIR's ultimate conclusions with respect to the project's impacts on chloride concentrations. In summary, a comprehensive analysis of potential project water quality impacts was conducted for chloride as a pollutant of concern. This impacts analysis included use of a water quality model to quantitatively predict chloride concentrations in project discharges to the Santa Clara River. Because

urban development implemented with proper source controls for chlorinated water features generally does not result in substantial chloride loads, and because, empirical data show that mean chloride concentrations in urban runoff are typically lower than those in agricultural runoff, it is not surprising that modeled chloride concentrations are predicted to decrease due to project implementation.

The predicted average annual chloride concentration in stormwater runoff from the project area (14 mg/L) is at the low end of the range of observed concentrations for this pollutant and is well below the Santa Clara River Reach 5 Basin Plan water quality objective and the TMDL waste load allocation for Santa Clara River Reach 5 (100 mg/L for both).

As is discussed in the draft Newhall Ranch WRP NPDES Permit Fact Sheet (p. F-13), the Upper Santa Clara River chloride wasteload allocations (WLAs) are expressed on a concentration basis derived from and equivalent to the existing water quality objective for Reaches 5 and 6 of the Santa Clara River, thereby providing direct protection for agricultural supply. Under the TMDL Implementation Plan, a special study was conducted to confirm that the concentration-based WLA of 100 mg/L chloride is protective of this beneficial use. A concentration-based WLA also accommodates future growth and provides beneficial uses protection from chloride loads that were in place at the time of the TMDL development. Protection of beneficial uses from additional chloride loads that were not assigned wasteload allocations is provided by using the WLAs as effluent limits in permits for new and future sources, such as the Newhall Ranch WRP.

Further stated in the Fact Sheet (p. F-13), the Staff Report for the TMDL, dated August 21, 2002, states: "[a] concentration-based target accommodates future growth by allowing increased mass as long as it is accompanied by additional flow…" The Fact Sheet finds that water quality will not be degraded if concentration-based wasteload allocations that are equivalent to the water quality objectives are assigned to new facilities at the end of pipe. The Fact Sheet also states that studies regarding the effect of additional chloride load on groundwater basins underlying the Upper Santa Clara River are underway and scheduled for completion by November 2007 (Fact Sheet p. F-14). Initial results from these studies show that discharges at effluent limits of 100 mg/L chloride will not degrade groundwater quality. Results from these studies may be used to revise the effluent limits through modification of the NPDES permits for all dischargers discharging at 100 mg/L if necessary.

As a result, with implementation of required BMPs, project water quality impacts on chloride will be less than significant.

Response 8

Long-term operation and maintenance of the stormwater treatment BMPs are discussed in the Landmark Village Draft EIR, Section 4.3, Table 4.3-12, and in Appendix 4.3, the Landmark Village Water Quality Technical Report. The homeowners' associations or business owners will be responsible for operation and maintenance of site-based BMPs (such as bioretention facilities placed in common area landscaping within multi-family residential areas and commercial areas), and subject to inspection by the Los Angeles County Department of Public Works ("LADPW"); LADPW will be responsible for maintenance of village-level and sub-regional BMPs (vegetated swales and extended detention basins). This approach is consistent with the Construction General Permit and the MS4 Permit.

Response 9

The comment states, correctly, that the Landmark Village project's potable water demand of 702 afy would not create overdraft conditions in the Eastern Basin. The statement in the comment that neither the Alluvial aquifer nor the Saugus Formation show any indication of overdraft is also consistent with data provided to the County by CLWA and the retail purveyors in the Santa Clarita Valley. (See, e.g., 2005 Basin Yield Report, 2005 UWMP, including Appendix C, and the 2006 Santa Clarita Valley Water Report.) In addition, the comment states, correctly, that the pumping for the Landmark Village project will simply off-set agricultural pumping by the project applicant; and, therefore, there is no reason why surface water flow at the Los Angeles County/Ventura County line would be impacted.

Response 10

The comment correctly notes that the Landmark Village project is the first phase of the Newhall Ranch Specific Plan. The comment requests monitoring of the groundwater and surface water conditions over the long-term to account for cumulative development, including build-out of the Newhall Ranch Specific Plan. The County has confirmed that CLWA's adopted Groundwater Management Plan (GWMP) includes monitoring of groundwater levels, quality, production, and subsidence, and the monitoring and management of surface water flows and quality. The monitoring efforts are referenced in the 2005 UWMP for the CLWA service area and the annual water reports for the Santa Clarita Valley issued by CLWA and the retail water purveyors in the Valley. These efforts will continue, in cooperation with the United Water Conservation District.

Response 11

The comment correctly references the fact that, since 2001, the United Water Conservation District has been working with the Santa Clara Valley Upper Basin Water Purveyors in a cooperative approach to

solving regional groundwater management issues. United Water Conservation District also correctly points out that development of the regional groundwater model for the Santa Clarita Valley was an important technical improvement for addressing potential impacts associated with various scenarios of groundwater pumping in the Santa Clarita Valley. Like United Water Conservation District, the County is also comfortable with the efforts of CH2MHill and John Porcello and his team in creating the regional groundwater model. The comment recommends monitoring of groundwater and surface water. The County concurs with these comments, and endorses the monitoring of groundwater and surface water by CLWA and the retail purveyors in the Santa Clarita Valley, in cooperation with United Water Conservation District.

Response 12

Please see **Response 11**, above.

Response 13

The comment is noted. No further response is required given that the comment does not address or question the content of the Draft EIR.

Letter No. D1

california water network

Carolee K. Krieger
president

Dorothy Green
secretary

Joan Hartmann
treasurer

Malinda Chouinard
director

Yvon Chouinard
director

Michael Jackson
director

Lloyd G. Carter
director

Tom Stokely
director

December 11, 2006

Attention: County of Los Angeles
Department of Regional Planning

RE: Landmark Village

We understand that you released the above document recently and wanted to let you know that we did not receive a copy.

We believe this must have been an oversight by your consultant as we consistently received notification and review copies of your project documents and wish to continue to do so. Please make sure we are on your notification list. 1

Also, please send us a copy of this document. 2

Thank you,

Carolee Krieger

Carolee Krieger, President
808 Romero Canyon Road
Santa Barbara, CA 93108

D1. Letter from California Water Impact Network, dated December 11, 2006

Response 1

The comment states that California Water Impact Network (C-WIN) did not receive a copy of the Draft EIR and that C-WIN had requested to be on the distribution list for project EIRs. C-WIN has been added to the distribution list of the Landmark Village project.

Response 2

The comment requested a copy of the document. In response, a copy of the Draft EIR on CD was sent to C-WIN.

Letter No. D2

SCOPE
Santa Clarita Organization for Planning and the Environment
TO PROMOTE, PROTECT AND PRESERVE THE ENVIRONMENT, ECOLOGY AND QUALITY OF LIFE IN THE SANTA CLARITA VALLEY
POST OFFICE BOX 1182, SANTA CLARITA, CA 91386

1-3-07

Mr. Daniel Fierros
Los Angeles County Regional Planning Dept.
320 W. Temple St.
Los Angeles, CA 90013

Re: Newhall Ranch, Landmark Village (Project No. 00-196-(5)
Request for Extension of EIR Comment Period

Dear Mr. Fierros

We are in receipt of the nine volumes Environmental Impact Report for this project and have begun our review. However, it appears that we will be unable to provide you with a thorough public review of this document by the close of the comment period due to the EIR's excessive size and its release over the holiday period.

As you may know, we are an all-volunteer group that provide comments on the accuracy and completeness of environmental documents for projects as a service to the public. We understand that the Environmental Quality Act is a partnership that requires public participation to provide you with information in order that the best project for both the developer and the community will result from the planning process. Therefore, we hope that the County will consider our limitations in this instance. 1

We also believe that this request will not interfere with the course of review for this project. The project will require an EIR/EIS for required permits affecting the Santa Clara River. That document has not yet been released. We believe that this process should not proceed the release of that document because impacts identified and mitigated for those federal and state permits may very well affect the design of the project before you.

Thus, we request that the comment period be extended to 120 days, ending March 24th, 2007. We thank you in advance for ensuring that this project receives the thorough public review that it deserves.

Sincerely,

Lynne Plambeck
President

D2. Letter from Santa Clarita Organization for Planning and the Environment, dated January 3, 2007

Response 1

The comment states that due to the size of the document the Santa Clarita Organization for Planning and the Environment (SCOPE) would not be able to submit comments by the close of the comment period. The comment requests that the public comment period be extended to 120 days. The public comment period was extended. For additional information responsive to the comment, please refer to **Topical Response 3**: Public Review Opportunities. The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not raise an environmental issue, no further response is required.

The comment also states that the related EIS/EIR project is underway and that the draft EIS/EIR for that project is not released. The comment states that the Landmark Village Draft EIR and related process should not precede the release of the draft EIS/EIR. For information responsive to this comment, please refer to **Topical Response 2**: EIS/EIR Project.

Letter No. D3

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Doug Linney
David Mogavero
Lynn Sadler
Teresa Villegas

January 5, 2007

Mr. Daniel Fierros
Los Angeles County Regional Planning Department
320 W. Temple St.
Los Angeles, CA 90013

Re: Request for Extension of EIR Comment Period for Newhall Ranch, Landmark Village [County Project No. 00-196-(5)]

Dear Mr. Fierros

The Planning and Conservation League requests that the Los Angeles County Regional Planning Department extend the public comment period for the Newhall Ranch Landmark Village Project [County Project No. 00-196-(5)] to allow all interested parties adequate time to assess and respond to the nine-volume Environmental Impact Report. 1

On behalf of our thousands of members across the state of California, and as one of the organizations responsible for the passage of the California Environmental Quality Act over thirty years ago, the staff of PCL wishes to devote careful attention to this development proposal, a proposal of clear statewide significance. Unfortunately, due to limited staff availability during the holiday period and the extensive nature of the project's documentation, we would be unable to do so under the current sixty day review period and therefore ask that the comment period be extended an additional sixty days to end on March 24th, 2007. We also ask that a copy of the EIR be sent to the address below, care of Matthew Vander Sluis, Project Manager. 2 3

We value this opportunity to participate as partners in the environmental review of the Newhall Ranch Landmark Village Project. We appreciate your understanding of our constraints and look forward to working with the Planning Department staff to ensure that decision makers and the public have access to accurate, thorough information that allows for thoughtful consideration of all possible environmental impacts of the proposed project and project alternatives. 4

Sincerely,

Matt Vander Sluis
Project Manager

1107 9th Street, Suite 360, Sacramento, CA 95814 Phone: 916-444-8726 Fax: 916-448-1789
Website: www.pcl.org Email: pclmail@pcl.org

D3. Letter from Planning and Conservation League, dated January 5, 2007

Response 1

The comment requests that the public comment period be extended for an additional 60 days to review the Landmark Village Draft EIR. Additional time has been provided. For further information responsive to the comment, please refer to **Topical Response 3:** Public Review Opportunities. The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not raise an environmental issue, no further response is required.

Response 2

The comment requests that the public comment and review period be extended to March 24, 2007. Please refer to **Topical Response 3**: Public Review Opportunities.

Response 3

The comment requests that a copy of the document be sent for review. In response, the Landmark Village Draft EIR was sent to the Planning and Conservation League (PCL).

Response 4

The comment states that PCL looks forward to working with the County to ensure consideration of all environmental impacts and project alternatives. The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not raise an environmental issue, no further response is required.

Letter No. D4

Friends of the Santa Clara River

660 Randy Drive, Newbury Park, California 91320-3036 • (805) 498-4323

Board of Directors

Ron Bottorff
Chair
Barbara Wampole
Vice-Chair
Ginnie Bottorff
Secretary

Affiliated Organizations

California Native Plant Society
L.A./Santa Monica Mountains Chapter

Santa Clarita Organization for Planning the Environment (SCOPE)

Sierra Club
Angeles Chapter
Los Padres Chapter

Surfrider Foundation

Audubon Society
Ventura Chapter

Ventura County Environmental Coalition

Wishtoyo Foundation

January 6, 2007

Mr. Daniel Fierros
Los Angeles County Department of Regional Planning
Impact Analysis Section, Room 1348
320 West Temple St.
Los Angeles, CA 90012

Re: Request for Extension of EIR Comment Period - Newhall Ranch, Landmark Village (County Project No. 00-196)

Dear Mr. Fierros,

It will be very difficult for Friends of the Santa Clara River to complete its review and comment on the subject document by January 22, 2007. This EIR is a very large document covering multiple complex issues and was released over the year-end holiday period, a busy and hectic time of year. 1

Non-profit groups such as ours who wish to provide comments first have to find enough resources to cover compensation of experts, so that our comments can be substantive and meaningful. This funding process is, in itself, time-consuming.

Extending the comment period will in no way delay the developer since the project cannot begin until a separate review process underway with the California Department of Fish and Game and the Army Corps of Engineers is concluded, which will involve release of a separate EIS/EIR on the entire project. 2 Also, it seems to us very advisable for the Landmark Village comment period to be kept open until after the release of this EIS/EIR, as it will raise several other issues to be addressed that likely will require additional mitigation that should be considered in the Landmark Village review process. 3

We therefore request that the comment period on the subject document be extended for an additional 60 days, to March 23, 2007. 4

Thank you for your consideration of this request.

Sincerely,

Ron Bottorff

Ron Bottorff, Chair

D4. Letter from Friends of the Santa Clara River, dated January 6, 2007

Response 1

The comment indicates that it would be difficult to comment on the Landmark Village Draft EIR given the length of the document and that it was released during the holiday season. The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not raise an environmental issue, no further response is required.

Response 2

The comment indicates that extending the time period to review the Draft EIR would in no way impact the project applicant's schedule because "the project cannot begin until a separate review process underway with the [CDFG and Corps] is concluded, which will involve release of a separate EIS/EIR. . . ." Please see **Topical Response 2**: EIS/EIR Project for further responsive information regarding the EIS/EIR Project.

Response 3

The comment suggests that the public comment period for the Landmark Village Draft EIR be left open until after the release of the EIS/EIR, and states that Friends of the Santa Clara River (Friends) suspects that the EIS/EIR will raise other issues to be addressed that will require additional mitigation in the Landmark Village review process. Please see **Topical Response 2**: EIS/EIR Project for further responsive information regarding the EIS/EIR Project and the processing issues raised in this comment.

Response 4

The comment requests that the public comment period be extended for an additional 60 days, to March 23, 2007. Additional time has been provided. For further information responsive to the comment, please refer to **Topical Response 3**: Public Review Opportunities.

Letter No. D5

SIERRA CLUB
FOUNDED 1892
Angeles Chapter

3435 Wilshire Boulevard
Suite 320
Los Angeles, CA 90010-1904

(213) 387-4287 phone
(213) 387-5383 fax
www.angeles.sierraclub.org

1-8-07

Mr. Daniel Fierros
Los Angeles County Regional Planning Dept.
320 W. Temple St.
Los Angeles, CA 90013

Re: Newhall Ranch, Landmark Village Project No. 00-196-(5)
Request for Extension of EIR Comment Period to 120 days

Dear Mr. Fierros

Thank you for providing the Sierra Club with a CD of the Landmark Environmental documents comprising nine volumes and maps. We are concerned that we will be unable to provide you with comments by the close of the comment period due to this EIR's large size. Also, its release over the holiday period when the Sierra Club offices were closed for several weeks and many of our volunteers were not available has made review difficult. 1

We believe it is in the County's best interest that the Club is provided adequate opportunity to provide you with information in order to ensure that broad public trust issues will be addressed.

We also request that the County not move forward with this project until the EIR/EIS for the Santa Clara River is released. That document will have a substantial impact on the configuration of this project because of impacts identified and mitigated for the required federal and state permits. 2

Therefore, we request that the comment period be extended to 120 days, ending March 24th, 2007. We thank you in advance for ensuring that this project receives a thorough public review. 3

Sincerely,

Jennifer Robinson
Conservation Coordination
Angeles Chapter

D5. Letter from Sierra Club, dated January 8, 2007

Response 1

The comment refers to receipt of the Landmark Village Draft EIR CD and indicates that it will be difficult to review the document adequately within the public comment period. The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not raise an environmental issue, no further response is required.

Response 2

The comment requests that the County not proceed with the Landmark Village Draft EIR until such time that the related EIS/EIR Project is released. Please see **Topical Response 2**: EIS/EIR Project for further responsive information regarding the EIS/EIR.

Response 3

The comment requests that the public comment period be extended to 120 days, ending March 24, 2007. Additional time has been provided. For further information responsive to the comment, please refer to **Topical Response 3**: Public Review Opportunities.

Letter No. D6

TriCounty Watchdogs

Mr. Daniel Fierros
Los Angeles County Regional Planning Dept.
320 W. Temple St.
Los Angeles, CA 90013

Date 1/13/07

TriCounty Watchdogs
16667 Steinhoff Rd
Frazier Park
California 93225
www.tricounty.org

Re: Newhall Ranch, Landmark Village (Project No. 00- 196-(5)
Request for EIR and Extension of Comment Period

Dear Mr. Fierros

We hereby request a CD copy of the Environmental Impact Report for this project. 1
Because of the excessive length of the report, we also ask that the comment period be extended. 2

Sincerely,

Jan de Leeuw, Executive Board, TCW

D6. Letter from TriCounty Watchdogs, dated January 13, 2007

Response 1

The comment requests a CD of the Landmark Village Draft EIR. A CD of the Draft EIR has been sent to TriCounty Watchdogs as requested.

Response 2

The comment requests that due to the length of the Landmark Village Draft EIR, the public comment period be extended. Additional time has been provided. For further information responsive to the comment, please refer to **Topical Response 3**: Public Review Opportunities.

Fierros, Daniel

From: jjbergamo@adelphia.net
Sent: Monday, January 15, 2007 4:59 PM
To: Fierros, Daniel; Tae, Susan
Cc: kimberly.rivers@gmail.com; oro1238@aol.com; jjbergamo@adelphia.net; troykefm@yahoo.com; Delfina.Becerra@ventura.org
Subject: Landmark Village

Follow Up Flag: Follow up
Flag Status: Red

The Piru Neighborhood Council unanimously and respectfully requests that the comment period for the DEIR/Landmark Village, County Project No. 00-196 be extended by 60 days. There is so much material, it is difficult for everyone concerned to access the document in hard copy; reading it online limits and prolongs the process. That and the fact that the document was released during the holiday season hampers a thoughtful review and analysis of the project. 1

The Piru Neighborhood Council, as representatives of the community closest to the proposed project, has definite concerns. These include water quality, air quality and traffic. 2
There are concerns about the amount of water that may be drawn from the aquifer east of us and the possible migration west of the perchlorate plume already present in the Santa Clarita water supply. 3 The "stabilization"/channelization of the Santa Clara River could increase the flood flow of the river to damaging speeds as it enters the Piru area. 4 The temporary routing of sewage to Santa Clarita is a concern; what is the route, and what is the risk of the line rupturing during a flood event? 5

There are many other issues, including the ecological damage that the project will bring. Without adequate time to study these issues, neither the public surrounding the project nor the potential residents will be fairly served. 6

Thank you for your consideration of this important request to extend the comment period. 7

Very sincerely,
Janet Bergamo, President
Piru Neighborhood Council

1

D7. Letter from Piru Neighborhood Council, dated January 15, 2007

Response 1

The comment requests that the public comment period for the Landmark Village Draft EIR be extended by 60 days given the difficulty of accessing a hard copy, of reading the document online, and of it being released during the holiday season. Additional time has been provided. For further information responsive to the comment, please refer to **Topical Response 3**: Public Review Opportunities.

Response 2

The comment contends that the Piru Neighborhood Council, as representatives of the community closest to the proposed project, has concerns, including water quality, air quality, and traffic. The Piru Neighborhood Council is mistaken about the Piru community being closest to the proposed Landmark Village project. The communities of Castaic, Val Verde, Stevenson Ranch, and the City of Santa Clarita in Los Angeles County are all closer to the Landmark Village project site. The Landmark Village Draft EIR addresses water quality, air quality, and traffic in Sections 4.3, 4.9 and 4.7, respectively.

Response 3

The comment expresses general concern about the amount of water that may be drawn from the Alluvial aquifer and the possible migration west of perchlorate, which is present in the Santa Clara River Valley groundwater basin. In response, the Landmark Village Draft EIR provides an extensive discussion of the groundwater that will be used to serve the Landmark Village project and other cumulative development in the Santa Clarita Valley. Please refer to the Draft EIR, Section 4.10, Water Service, pp. 4.10-17 through 4.10-33. This discussion includes an assessment of the "sustainability" of both the Alluvial aquifer and the Saugus Formation. The discussion concludes that both the Alluvial aquifer and the Saugus Formation are considered sustainable water supply sources, with no evidence of declining groundwater levels resulting in "overdraft" conditions. For further responsive information, please refer to **Topical Response 9**: Groundwater Supplies and "Overdraft" Claims.

In addition, the Draft EIR contains an extensive discussion of the groundwater quality in both the Alluvial aquifer and Saugus Formation, and it includes detailed information concerning perchlorate and its impacts on the local groundwater supply. (Draft EIR, Section 4.10, Water Service, pp. 4.10-63–4.10-69.) For further responsive information, please refer to **Topical Response 1**: Perchlorate Treatment Update.

Response 4

Impacts to hydrology and hydraulics were studied as part of the *Landmark Village Flood Technical Report*, which is included in Appendix 4.2 of the Landmark Village Draft EIR. The impacts to River velocity were

determined by comparing numerical modeling of the existing and proposed condition from the area in the River adjacent to Travel Village to a point just downstream of the Newhall Ranch boundary. Existing and proposed velocity distributions are shown in Figures 3.2A-G and 4.2-G for the 2-, 5-, 10-, 20-, 50-, 100-year and Capital storms, respectively. The results of this modeling are tabulated in **Table D-1, Santa Clara River Landmark Village Existing and Proposed Conditions HEC-RAS Model Capital Water Surface Elevation and Velocity Below Potrero Canyon Creek**, of this response. The table shows values of water surface elevation and velocity for the Santa Clara River in the existing and proposed conditions below the Potrero Canyon Creek confluence. The table indicates that the buried bank protection, due to most of it being set back creating a large River corridor, results in water surface elevations and velocities in the River below the Potrero confluence that are substantially the same in the existing and proposed conditions. While the modeling only extends to an area generally west of the Los Angeles County/Ventura County line it is clear that no impacts to water surface elevation will be observed downstream of the Landmark Village project site in the Piru area. Moreover, the project does not alter the existing hydrology of the River as noted in Table 4.1, p. 4-1, of the *Landmark Village Flood Technical Report* (Draft EIR, Appendix 4.2). Because the proposed Landmark Village project does not alter river hydrology, and because it does not alter water surface elevations or velocity below Potrero Canyon, no impacts are expected in the Piru area as a result of the proposed project.

TABLE D-1: SANTA CLARA RIVER LANDMARK VILLAGE EXISTING AND PORPOSED CONDITIONS HEC-RAS MODEL CAPITAL WATER SURFACE ELEVATION AND VELOCITY BELOW POTRERO CANYON CREEK

SECTION	EXISTING		PROPOSED		Δ	
	WSE	VELOCITY	WSE	VELOCITY	WSE	VELOCITY
14315	862.2	11.2	862.2	11.2	0.0	0.1
14090	860.5	12.3	860.5	12.3	0.0	0.0
13850	859.4	11.8	859.4	11.8	0.0	0.0
13635	857.1	13.9	857.1	13.9	0.0	0.0
13425	856.2	12.2	856.2	12.2	0.0	0.0
13190	855.7	10.5	855.7	10.5	0.0	0.0
13030	855.2	10.4	855.2	10.4	0.0	0.0
12835	854.6	10.6	854.6	10.6	0.0	0.0
12615	854.2	10.4	854.2	10.4	0.0	0.0
12395	853.8	10.3	853.8	10.3	0.0	0.0
12195	853.6	9.8	853.6	9.8	0.0	0.0
11995	852.9	10.8	852.9	10.8	0.0	0.0
11780	852.6	10.3	852.6	10.3	0.0	0.0
11605	851.9	11.4	851.9	11.4	0.0	0.0
11405	851.3	12.1	851.3	12.1	0.0	0.0
11180	849.6	14.8	849.6	14.8	0.0	0.0
11015	846.6	19.1	846.6	19.1	0.0	0.0
10835	843.0	22.7	843.0	22.7	0.0	0.0
10575	838.3	24.5	838.3	24.5	0.0	0.0
10390	837.4	21.1	837.4	21.1	0.0	0.0
10225	839.4	14.8	839.4	14.8	0.0	0.0
10000	839.0	13.3	839.0	13.3	0.0	0.0
9820	839.3	10.6	839.2	10.7	0.0	0.0
9595	838.7	9.6	838.7	9.6	0.0	0.0
9385	835.4	11.7	835.4	11.7	0.0	0.0
9220	834.3	11.3	834.3	11.3	0.0	0.0
9025	834.0	10.0	834.0	10.0	0.0	0.0
				MAXIMUM=	**0.0**	**0.1**
				MINIMUM=	**0.0**	**0.0**
				AVERAGE=	**0.0**	**0.0**

Response 5

The comment expresses concern over the temporary routing of the sewage to Santa Clarita and the risk of the line rupturing during a storm event. The route of the wastewater line, if the Newhall Ranch Water Reclamation Plant (WRP) is not operational prior to development of the Landmark Village project, would follow Henry Mayo Drive to The Old Road to the existing Valencia WRP. With regard to stability of the risk of a wastewater line rupturing during a flood event, the Landmark Village Draft EIR, Section 4.2, Hydrology, p. 4.2-36, states:

> "The utility corridor is comprised of several alignments dependent upon the specific type of service. The majority of the alignment is located away from the Santa Clara River and tributaries and would not require bank protection or other measures that may affect river hydraulics, with the exception of approximately 6,600 linear feet of geotextile reinforced bio-engineered erosion protection installed downstream of the project site along the northern edge of the river corridor from Chiquito Canyon to San Martinez Grande Canyon and the approved buried bank stabilization to be constructed directly north of the Valencia WRP. This erosion protection would provide bank stability protection along this portion of the utility corridor.
>
> TRMs are one type of reinforced bio-engineered bank stabilization material. TRMs and geotextile reinforced bio-engineered bank stabilization methods are designed to reinforce vegetation at the root and stem, thereby allowing vegetation to be used as erosion control in areas where flow conditions could exceed the ability of natural vegetation to remain rooted. TRMs and other geotextiles are suitable for locations with high slopes or stream banks where grouted riprap and concrete channels are hydraulically unnecessary and hardened bank protection is aesthetically undesirable. TRMs are secured to the soil surface using a predetermined staple pattern and either wire soil staples or biodegradable stakes. TRM products are constructed of two basic materials that perform different functions: (1) permanent netting designed to provide permanent structure and strength to the vegetation at the root and stem level; and (2) degradable natural and synthetic fiber netting that provides erosion control immediately after installation by holding seed and soil particles in place and trapping moisture on the soil surface. As a result, TRM products provide erosion control, vegetation establishment, and reinforcement at one location.
>
> The bank protection section of the utility corridor is located along the north bank of the river immediately downstream of the existing County Sanitation District Treatment facility/Valencia WRP, and would consist of bank stabilization between the river and the Old Road. This section of bank stabilization would be constructed in conjunction with the utility corridor. This approximately 2,000 linear feet of bank stabilization was analyzed and approved as part of the Natural River Management Plan (NRMP)."

The Landmark Village Draft EIR concludes that most of the corridor is not located adjacent to the Santa Clara River and, where it is located in close proximity, bank stabilization efforts will minimize risk impacts to rupture. Lastly, all utilities are subject to Los Angeles County Department of Public Works

and County Sanitation Districts' standards for pipe materials and placement requirements. No further analysis is required.

Response 6

The comment expresses general concern over "ecological damage" brought on by the proposed Landmark Village project. However, the comment does not specify the nature, scope, extent, or magnitude of the damage. The Landmark Village Final EIR, Section 4.4, Biota, contains an extensive discussion of the proposed project's impacts on sensitive biological resources, and contains an extensive mitigation program, which is designed to avoid or substantially lessen impacts to sensitive biological resources. In addition, the project's Biota Report provides extensive technical information responsive to this general comment. This report is found in **Appendix A** of this Final EIR. In light of the general nature of the comment, no further analysis or response is required.

Response 7

The comment is noted. No further response is required given that the comment does not address or question the content of the Draft EIR.

Letter No. D8

Audubon CALIFORNIA

[illegible]
[illegible]
[illegible]
[illegible]
www.[illegible]

January 19, 2007

Mr. Daniel Fierros
Los Angeles County
Department of Regional Planning
320 West Temple Street
Los Angeles, CA 90012

Dear Mr. Fierros:

We submit these comments to the Draft Environmental Impact Report for the Landmark Village phase of the proposed Newhall Ranch development west of Santa Clarita **(Project No. 00-196 / Tract Map No. 53108 / Landmark Village; hereafter "DEIR")**. Our analysis indicates that Newhall Land and the County of Los Angeles have not conducted proper environmental review of this project, despite the issuance of the DEIR, and detail our objections below. 1

These comments are submitted on behalf of Audubon California and the following Audubon chapters: Los Angeles Audubon Society, San Fernando Valley Audubon Society, and Ventura Audubon Society. These are all non-profit, public interest organizations devoted to the conservation of wildlife and other natural resources. National Audubon Society and its chapters have an estimated 50,000 members in California, many of whom birdwatch and enjoy the natural habitats of the Los Angeles area. Since 2003, Audubon has held a Christmas Bird Count centered on Santa Clarita, which attracts participants from throughout Los Angeles County, and in 2004, Audubon identified the Santa Clara River Valley as one of 150 Important Bird Areas of California[1].

BACKGROUND

Ecological Setting of Project Area

When complete, the development of Newhall Ranch in northwestern Los Angeles County will impact more than 10,000 acres, making it one of the largest developments ever proposed in the county[2]. Roughly half of the land within the ranch will be kept as open space, but this will be mainly restricted to the steep upper slopes in the southwest corner of the ranch, and along a narrow corridor (less than a half-mile wide) following and including the Santa Clara River[3]. Aside from these two areas, just over 1,500 acres of existing open space will be permanently protected within the Salt Creek watershed in adjacent Ventura County, contiguous to the ranch. Still, more than 5,000 acres, mainly coastal scrub and grassland are slated for conversion through residential and commercial development. 2

[1] Cooper, D.S. 2004. *Important Bird Areas of California*. Audubon California. 286 pp.
[2] Conservation Biology Institute (CBI) 2005. *Ecological Impact Assessment of Urban Development on the Santa Clara River Watershed, California* (unpublished report). Prepared August 2005.
[3] Impact Sciences, Inc. 2006. Landmark Village Draft EIR. November 2006. Section 4.4 "Biota".

audubon CENTENNIAL CELEBRATING 100 YEARS OF CONSERVATION

Landmark Village, the first in a series of three large residential and commercial developments proposed for Newhall Ranch, is proposed for undeveloped land along the Santa Clara River. Undammed its entire 80-mile length from the Mojave Desert to the Pacific Ocean, the Santa Clara River watershed remains one of the most ecologically significant natural systems left in southern California, and projects like Newhall Ranch make it one of the most threatened. In 2005, the Santa Clara was named one of the nation's ten most endangered rivers by American Rivers, a national conservation group, which cited the proposed Newhall Ranch as a primary threat[4]. Unlike beaches and mountains in the region, over 95% of land immediately surrounding the river is in private ownership, which means that conservation of its steelhead run, willow and cottonwood forest will rest on the efforts to work with private landowners to secure and restore the river and its associated habitat at a time that numerous development projects are being proposed along the river. 3

Indeed, within the stretch between Castaic Junction and Santa Clarita, fully 51% of the remaining open space within five miles of the river either is impacted by current projects or is proposed for development[5]. Thus in order to protect the Santa Clara River and reverse a number of the current or impending threats such as channelization, down-cutting, and exotic species infestations that have seriously degraded so many other rivers in the region, necessarily involves identifying key remaining areas for conservation and then working closely with public agencies and private landowners to protect them. This effort depends on reliable, up-to-date ecological information from which sound scientific conclusions may be drawn.

Because Newhall Land requires confidentiality agreements for all wildlife surveys conducted on the project area, and because the site has been closed to public visitation for decades, the biota of the proposed Landmark Village - and of Newhall Ranch as a whole - is virtually unknown to all but a handful of people, none of whom are free to share their findings with the scientific community except through publications released by the landowners. Because these publications represent the only primary sources of ecological information that is made available to the public before the proposed Newhall Ranch development, it is imperative that these landowner-sponsored reports present a complete and accurate accounting of the biological resources present on Newhall Ranch. Only in this way can the County of Los Angeles allow the public and decision-makers to consider the effects of the proposed project in the "full environmental context," as specified in Section 15125 (c) of the California Environmental Quality Act (CEQA). One way for members of the public to assess the adequacy of a CEQA document is to extrapolate which species and other natural resources *should* be present on the project site by examining known records of species distributions on public lands surrounding the site (e.g., at Castaic Lagoon and Placerita Canyon). Based on previous surveys of adjoining lands, we have serious concerns that the landowner's reports and the County's DEIR appear to represent something less than the "full environmental context" mandated under CEQA. 4 5 6

Description of Proposed Development

Slated to impact nearly 1,000 acres of natural open space along the Santa Clara River just west of Interstate 5 (DEIR: 4.4-59), Landmark Village proposes nearly 1,500 dwelling units, over a 7

[4] CBI 2005, p. 21
[5] CBI 2005, p. 28

2

million square feet of commercial space, and a major new bridge over the Santa Clara River through currently undeveloped wildlands. Of the 17 miles of tributary streams that Newhall Ranch proposes to eliminate[6], many are found at the Landmark Village site. 7

Over a dozen major habitat types will be impacted by Landmark Village, including the removal or disturbance of nearly all the existing grassland, oak woodland, pastureland and coastal sage scrub within the development footprint (DEIR; Table 4.4-8). The County acknowledges that project implementation will cause "significant unavoidable impacts...due to the loss of many sensitive animal species, coastal sage scrub, and wildlife habitat, and the increase in human and domestic animal presence [and] contribute to a significant unavoidable cumulative impact related to the ongoing loss of biological resources in the project region" (DEIR; 4.4-1). 8

From the DEIR for Landmark Village, we know that the project will eliminate essentially all of the remaining agricultural land in the coastal slope of Los Angeles County, now restricted to the northeastern corner of the ranch along Hwy. 126. 9 Though this habitat is not recognized as wildlife habitat in the DEIR, the State recognizes several types of cropland present on the ranch as wildlife habitat[7], and many of the rarest and most threatened birds in the region are dependent on these grasslands and grassland-like areas for their survival. 10 In addition, the project will place over a thousand homes immediately adjacent to what is still one of the most ecologically intact riparian forests left in southern California (DEIR; 4.4-53). 11 And, it ushers in what is poised to become a major new city directly between two major roosting areas of the endangered California Condor. 12

OVERVIEW OF COMMENTS

Based on our review of the DEIR, we find the environmental review performed by the applicant (Newhall Land) to be inadequate which therefore precludes a meaningful evaluation of the ecological impacts of the Landmark Village project.

We divide the deficiencies into several parts:

1. The DEIR fails to identify the complete suite of sensitive bird species expected from the project area. 13
2. The DEIR relies on bird surveys that were inadequate to credibly assess the range of projected impacts to sensitive species that *were* treated. 14
3. The DEIR mischaracterizes the actual status of sensitive bird species reported from the site. 15
4. The DEIR mischaracterizes projected and potential impacts to sensitive bird species and their habitats. 16
5. The DEIR does not describe specific measures that must be undertaken in order to provide the maximum feasible mitigation for impacts that are deemed significant, relying instead upon general recommendations that in no way address the ecological needs of species to be impacted. 17

[6] CBI 2005, p. 22

[7] This list would include Cropland (CRP), Dryland Grain Crops (DGR), Irrigated Grain Crops (IGR), Irrigated Hayfield (IRH), and Irrigated Row and Field Crops (IRF), per Mayer, K.E. and W.F. Laudenslayer, Jr. 1988. *A Guide to Wildlife Habitats of California*. State of Calif. Resources Agency, DFG, Sacramento.

6. The DEIR fails to provide the "full environmental context" mandated under CEQA Section 12125 (c). 18

Because of these deficiencies, we conclude that the construction of Landmark Village, as proposed, presents an unacceptable level of impact, and promises irreversible ecological degradation to one of the last large and unprotected expanses of wildlands that exist on the coastal slope of southern California. Our specific comments are presented below. 19

1. Failure to identify all sensitive species present or potentially present on the project site.

From a pool of at least 25 sensitive bird species with the potential to occur in the project area, the DEIR considers just nine as occurring on the site. The DEIR preparer apparently bases these findings on just two sources of information, the California Natural Diversity Database (CNDDB) and a handful of bird surveys conducted by a single observer in 2002, 2003 and 2004. 20

Maintained by the California Department of Fish and Game, the CNDDB is a database of sensitive species locations, but is entirely dependent on voluntary submissions by a small number of biologists and consultants; indeed the vast majority of records of sensitive species are never captured in this database. 21

Three sensitive bird species were totally omitted in the Biota section of the report, despite their being present in and around Newhall Ranch: 22

- California Condor (*Gymnogyps californianus*)
- Short-eared Owl (*Asio flammeus*)
- California Spotted Owl (*Strix occidentalis occidentalis*)

The federally endangered California Condor - the rarest and arguably one of the best-studied birds in the United States - famously resumed breeding a few years ago in the Sespe Wilderness just northwest of the project area, near a historical release/feeding site that has long been the focus of an intensive (and expensive) recovery effort. Around 2001, small numbers of condors began to be seen over the hills above Sylmar, Los Angeles Co., just southeast of the project area, and even roosted here (through 2006)[8,9]. Because the project area lies directly between these two areas, condors are known to fly directly over Newhall Ranch, even if they don't stop to forage here[10]. However, no raptor surveys have ever been conducted that would confirm the species' actual status on the project site, and no satellite telemetry data (e.g., from US Fish and Wildlife Service) were obtained for this DEIR. 23

Remarkably, a second missing species, the Short-eared Owl (California Bird Species of Special Concern), was actually documented on recent surveys of the ranch[11,12]. It would be expected in agricultural and grassland habitat throughout the site, at least in migration and winter. Since 24

[8] *fide* K.L. Garrett, Los Angeles County Museum of Natural History; Condor sightings in the area are concentrated in spring (Mar. -June); see also Los Angeles Times B1, Mar. 27, 2002, and LACoBirds (Yahoo Group).
[9] see: http://www.birdsofwestwood.com/condors/Condors.html; http://www.habitatwork.org/condor.htm
[10] J. Grantham, USFWS, pers. comm., Jan. 2007.
[11] Dudek & Associates, Inc. 2006. *Draft Biological Resources Technical Report: Newhall Ranch High Country Specific Management and Salt Creek Area.* Prepared for The Newhall Land and Farming Company. October 2006. p. 36.
[12] A freshly-dead individual was found at the edge of a cultivated field just west of I-5 during the Santa Clarita Christmas Bird Count on 27 Dec 2006 (specimen to Los Angeles County Museum of Natural History)

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much of the best agricultural habitat on Newhall Ranch is located within the Landmark Village project area, it would seem that Short-eared Owl would be directly and seriously impacted by the construction of Landmark Village. However, no surveys of these agricultural lands were conducted. Short-eared Owls are most easily detected at dusk and may therefore be routinely overlooked in typical morning bird surveys. 24

The California Spotted Owl (California Bird Species of Special Concern) breeds in oak and conifer forest in canyons both north[13] and east[14] of the site, and is resident at low elevations in several shady canyons elsewhere in the region. It is not generally encountered by casual observation, nor by California Gnatcatcher surveys such as those performed on the project area. No noctural surveys were conducted that might have discovered this species here (or other nocturnal species). 25

Additional sensitive species identfied in the most recent version of the California Bird Species of Special Concern list[15] were not addressed by the preparers of the DEIR, despite the information being easily accessbile online for several years. These additional species that could occur within the study area include:

- Ferruginous Hawk (*Buteo regalis*)
- Long-billed Curlew (*Numenius americanus*)
- Purple Martin (*Progne subis*)
- Swainson's Thrush (*Catharus ustulatus*)
- Clark's Marsh Wren (*Cistothorus palustris clarkae*)
- Grasshopper Sparrow (*Ammodramus savannarum*)
- Black-chinned Sparrow (*Spizella atrogularis*)
- Yellow-headed Blackbird (*Xanthocephalus xanthocephalus*)

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None of these species were treated in the DEIR, and no specific surveys were conducted that would detect them. We recommended that further surveys be conducted to determine presence and potential impacts to these species. Several of these species are already known to occur within the vicinity. For example, the Long-billed Curlew winters in agricultural habitat throughout Ventura and Los Angeles Counties (e.g. on the Oxnard Plain and in the Antelope Valley) and could winter within the project area. Up to 25% of the state's population of Purple Martins breeds in oak savannah in nearby Tehachapi Mountains.[16], and nesting pairs may be present in similar habitat on Newhall Ranch (which was unsurveyed). Grasshopper Sparrow breeds in grassland throughout coastal southern California, but the upland surveys conducted for this DEIR focused on coastal sage scrub, which does not support this species. 27 28 29 30

2. Bird surveys are inadequate to accurately portray the ecological impact of proposed development.

Typically, environmental documentation for development projects involves the identification of sensitive species potentially impacted by the project, a description of surveys conducted that 31

[13] Known sites incl. Warm Springs, Fish, Shake and Lion Canyons; upper Piru Cr.; *per* The Nature Conservancy 2006. *Santa Clara River: Upper Watershed Conservation Plan.* Fall 2006: p. D19, D22.
[14] Resident in oak woodland at Walker Ranch; *per* Ian Swift, Placerita Canyon County Park. Dec. 2006.
[15] Point Reyes Bird Observatory, *unpubl. data.*
[16] Cooper, D S. 2004. *Important Bird Areas of California.* Audubon California. 286 pp

confirm or refute the presence of these species, and a list of proposed remedies to offset any impacts deemed to be significant or potentially significant. The Landmark Village DEIR appears to take a different approach, conducting targeted surveys for a small number of species within a limited portion of the site, and conducting no surveys over large areas of the ranch that almost certainly would have yielded sightings of several species that could be impacted by the project. This lack of data seriously hinders the formulation of appropriate analysis and development of appropriate mitigation measures. 31 32

Major deficiencies of the bird surveys conducted for the DEIR include:

1. Inappropriate surveys for federally threatened California Gnatcatcher (*Polioptila californica californica*). 33
2. No surveys or reference to research (e.g., telemetry data) for the California Condor, which is known to occur on either side of the property. 34
3. No winter bird surveys, necessary to detect such sensitive species as the Ferruginous Hawk and Long-billed Curlew. 35
4. No nocturnal bird surveys necessary to detect sensitive owl species such as Long-eared Owl (*Asio otus*) and Spotted Owl. 36
5. No bird surveys of agricultural fields and extensive grassland habitat that might have detected sensitive grassland birds such as Ferruginous Hawk, Northern Harrier (*Circus cyaneus*), Long-billed Curlew, Burrowing Owl (*Athene cunicularia*), Short-eared Owl, Horned Lark (*Actia alpenstris*), Loggerhead Shrike (*Lanius ludovicianus*) and Grasshopper Sparrow. 37
6. No raptor surveys that might have detected locations of nesting and foraging Cooper's Hawk (*Accipiter cooperii*), Golden Eagle (*Aquila chrysaetos*), White-tailed Kite (*Elanus leucurus*) and Prairie Falcon (*Falco mexicanus*). 38
7. No bird surveys of alkali marsh/wet meadow habitat for Northern Harrier, Clark's Marsh Wren, Yellow-headed Blackbird and Tricolored Blackbird (*Agelaius tricolor*). 39
8. Few bird surveys of coastal sage scrub (those conducted were for a single species, Coastal California Gnatcatcher). 40

The surveys that were conducted for the California Gnatcatcher on the site were not completed according to protocol set by the U.S. Fish and Wildlife Service, which stipulates that a single observer should cover no more than c. 80 acres of potentially suitable habitat per survey day, and which requires six visits to each area during the breeding season in order to confirm the gnatcatcher's presence or absence during that breeding season[17]. According to the project DEIR, Landmark Village will remove 1,820 acres of coastal sage scrub[18] (the only habitat of the California Gnatcatcher), which suggests that more than 20 surveys would have been required to reliably confirm the presence or absence of gnatcatchers. Yet, just *five* surveys were conducted, in several cases at multiple locations on a single survey day[19]. The areas to be impacted are far too large to cover in just five surveys. This inadequate survey design casts doubt on the purported absence of California Gnatcatcher at the site, and it could help explain why common scrubland bird species known to occur in the region (e.g., Sage Sparrow) went unrecorded on these gnatcatcher surveys. 41 42

[17] Coastal California Gnatcatcher (*Polioptila californica californica*) Presence/Absence Survey Guidelines. February 28, 1997. Available on the World Wide Web: http://www.fws.gov/ventura/sppinfo/protocols/coastal-gnatcatcher_survey-guidelines.pdf
[18] DEIR, section 4.4-3
[19] DEIR: Appendix 4.4j-o.

Inadequate bird surveys for a variety of important habitats seriously undermine the validity of the environmental impact analysis conducted for the Landmark Village project. Most troubling, those habitats that were *best*-surveyed, such as the riparian woodland along the Santa Clara River, will be relatively safe from development, whereas those that were essentially *unsurveyed*, agricultural and grassland areas, are the ones to be mostly destroyed by proposed development. The ramifications of the project's incomplete surveys and inadequate analyses are discussed below. 43

3. Status of sensitive bird species portrayed inaccurately 44

Information about the status of sensitive species in the project area is scattered throughout the Biota section and in the Appendices, making it difficult to locate and interpret. A careful reading of the document reveals more than 30 sensitive bird species known or believed to occur on or in the vicinity of the Landmark Village project site. Of course, not all of these birds are present throughout the year, and some may be only marginal in occurrence in the area (i.e., they may visit the site only occasionally). 45

Even the species that are listed as occurring on the site are accompanied by virtually no specific information on their local status and distribution that would allow members of the public or decision-makers to judge the impact of the development on their survival. For example, one species formerly common throughout California, the Loggerhead Shrike, is now nearing extinction as a nesting species on the coastal slope of southern California and adjacent Baja California, mostly as a result of urbanization[20]. Fewer than five birds have been recorded on the Santa Clarita Christmas Bird Count each year since its inception in 2002, and it is possible that Newhall Ranch may have one of the largest resident populations in coastal southern California - three individual birds were observed during a brief tour of a small portion of the project area in December 2006, and suitable habitat exisits virtually throughout the project area. Although shrikes were occasionally reported on the 2002-2004 bird surveys, the preferred habitat for this species - agricultural fields such as those along Hwy. 126 - went unsurveyed during the preparation of this DEIR, and are now slated for conversion to residential development, which is incompatible with breeding shrikes. 46

An almost identical situation exisits for the California Horned Lark; indeed, the development of Newhall Ranch could nearly eliminate remaining suitable breeding habitat for this species on the coastal slope of Los Angeles and Orange counties. Yet, virtually no information on this species on the Landmark Village site is presented in the DEIR or in previous environmental documentation for the project area. 47

Bird species that the DEIR preparer reports as having the *potential* to occur on the site (Table 4.4-6 Special-Status Wildlife Species with Potential to Occur on the Project Site) were given equally uneven and vague treatment in the document. These include: 48

- Merlin (*Falco columbarius*)
- Yellow-billed Cuckoo (*Coccyzus americanus*)
- Long-eared Owl

[20] See, e.g., Unitt, P. 2004. *Birds of San Diego County*. San Diego County Museum of Natural History

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- Western Burrowing Owl
- Southwestern Willow Flycatcher (*Empidonax traillii extimus*)
- Coastal California Gnatcatcher
- Summer Tanager (*Piranga rubra*)
- Bell's Sage Sparrow (*Amphispiza belli belli*)
- Tricolored Blackbird

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Some of these species are probably simply not present, such as the riparian obligates (cuckoo, flycatcher and tanager), all of which were probably adequately surveyed for during the preparation of the DEIR. The Merlin is fairly common throughout southern California, including in urban areas, and is no longer considered to be a California Bird Species of Special Concern[21].

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However, the Long-eared Owl was simply not surveyed within the project area, as it is only detected through nocturnal surveys (which were not conducted). Interestingly, this owl was recorded from upland portions of the ranch[22], and there is a very high probability of its occurring within the development footprint given its preferred habitat dense groves of trees surrounded by grassland or agriculture lands.

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The Burrowing Owl is almost definitely present on the ranch; Dudek & Associates (2006:36) refers to Newhall Ranch employees mentioning "groundowls" (*sic*), which are almost certainly this species. Unfortunately, the preferred habitat of the Burrowing Owl, level, non-native grassland and cultivated fields/pastureland, went unsurveyed during the preparation of the DEIR. This owl is essentially extirpated on the coastal slope southern California, and large, private ranches such as Newhall Ranch may be its last hope of survival in the region. Had grassland been surveyed on the site, we might know the locations of their colonies and would have a chance to plan around them.

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Unlike the Burrowing Owl, the Bell's Sage Sparrow is locally common throughout the Santa Clarita area (D.S. Cooper, unpubl. data), being resident in coastal sage scrub and chamise chaparral. For example, since 2002 participants on the Santa Clarita Christmas Bird Count have found this sparrow in Newhall, Castaic, Sand Canyon and along the north side of Hwy. 126 vic. Castaic Creek. This species' purported absence from the whole of Newhall Ranch is simply not credible; it is possible that the single bird surveyor employed by Newhall Land may not have been familiar with its vocalizations, which resembles those of other sparrow species.

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As for the Tricolored Blackbird, the lack of observations during the surveys for the project raises concern - dozens of these distinctive birds winter in the agricultural fields of Newhall Ranch that are proposed for conversion to houses as part of the Landmark Village, with birds easily seen and heard from pull-outs along The Old Road (D.S. Cooper, unpubl. data). Nesting Tricolored Blackbirds were found recently just west of the project area along Salt Creek[23] and the species is known to breed in marshes along the entire northern flank of the San Gabriel Mountains. (D.S. Cooper, unpubl. data). Since potential nesting habitat was apparently unsurveyed on the Landmark Village site, it is possible that additional breeding sites are located here.

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[21] Point Reyes Bird Observatory, *unpubl. data*.
[22] Dudek & Associates 2006.
[23] T. Hovore, Frank Hovore & Associates, Inc., *pers. comm.* May 2003.

Given these obvious errors and omissions, it is unsurprising that several of the species categorized as Special-Status Wildlife Species *Not Expected* on the Project Site (italics mine: Table 4.4-7) include two birds that are, in actuality, very much expected on the project site. One of these, the Prairie Falcon, was recorded by Dudek & Associates on Newhall Ranch[24], and has been recorded annually in the Santa Clara River Valley in winter (D.S. Cooper, unpubl. data). Oddly, the Prairie Falcon was listed in Table 4.4-6 as likely to suffer significant impact due to project implementation. How could a bird suffer a significant impact if it is not expected on the project site? 54 55

An almost identical situation exisits for the Ferruginous Hawk, listed in Table 4.4-7 as being not expected on the project site. An adult Ferruginous Hawk was well seen by Newhall Land employees and local conservationists on a brief site tour on 11 December 2006 (*pers. obs.*), and in the same area during the 2006 Christmas Bird Count later in the month, in typical habitat (dry, barren cultivated field). 56

Regardless of these contradictions and omissions, the fact that neither Prairie Falcon nor Ferruginous Hawk was listed in recent bird surveys in no way suggests (a) that they don't occur on the site, nor (b) that they would not be impacted by project implementation. Winter bird surveys are required to detect Ferruginous Hawks, which are present in southern California only from November to March; Prairie Falcons would *not* be expected to occur along a forested river where most of the bird surveys took place, but would be seen foraging over dry scrub and grassland - the very habitat slated for development. Nesting falcons require isolated rock and sandstone outcrops, and only through a systematic search of these features in the region would one detect nesting Prairie Falcon, a species nearly extirpated (if not entirely so) as a breeder in coastal southern California. 57 58

4. The DEIR mischaracterizes impacts to sensitive bird species.

Numerous sensitive species known or suspected to occur in the project area are listed as being poised to suffer a Not Significant impact from the development, which implies that either they are not regularly present, or that mitigation measures will offset the loss of habitat, human disturbance, and other threats associated with build-out of the project. While some of these sensitive species (e.g., the Vermilion Flycatcher) are unlikely to be affected simply by virtue of their marginal occurrence here, others almost definitely reside within the footprint of the proposed development, including the numerous small tributaries of the Santa Clara River slated for cement channelization and in the extensive agricultural lands to be replaced by houses. For example, two common riparian woodland nesters, Cooper's Hawk and Yellow Warbler, were recorded on several of the 2002-04 bird surveys, but the DEIR omits location data on where they occur within the project area, much less information on nest locations that would be necessary for their management on the site. Therefore, it is difficult to determine that project implementation will entail less than significant impacts to these species. 59 60

A similar situation involves species that the DEIR claims will suffer a significant impact with the completion of Newhall Ranch [see Table 4.4-1 Significant Biological Impacts - Newhall Ranch Specific Plan and WRP (= Valencia water reclamation plant)]. As with the non-significant impacts, the data presented are implausible, and in some cases, are contradicted outright later in 61

[24] Dudek & Associates 2006, p. 21.

the Biota section. For example, we learn from Table 4.4-1 that the (State threatened) Swainson's Hawk a) occurs on the site and b) would suffer a significant impact from the development, even after mitigation measures are undertaken. However, the document provides no description of the species' usage of the site elsewhere in the document, and this hawk apparently went undetected during surveys conducted here in 2002, 2003 and 2004. Of course, the mitigation guidelines do not discuss what might be done to reduce the project's significant impacts to Swainson's Hawks, which require groves of tall trees surrounded by grassland or agricultural lands for breeding. In reality, the Swainson's Hawk neither breeds nor winters on or near the site; the only known nesting sites in southern California are located within a handful of ranchyards in the northeastern Antelope Valley[25]. 61 62

Another sensitive bird species listed in Table 4.4-1 as likely to suffer significant impacts and yet discussed nowhere in the report is the Mountain Plover (*Charadrius montanus*), a California Bird Species of Special Concern. Its inclusion is perplexing - it is known to occur in just four parts of southern California, the eastern Antelope Valley, the San Jacinto and Lower Colorado River valleys in Riverside County, and the Imperial Valley in Imperial County; all far from the project area. Because its preferred habitat, extensive cultivated fields, persists along Highway 126 in Newhall Ranch, the potential exists that Mountain Plover *could* occur here, but only in winter. However, since no winter bird surveys were conducted on or around the site, it is impossible to assess whether or they do occur. Once again, the DEIR provides no way for a reader to evaluate the conclusions reached therein. 63

Other sensitive/protected species listed as poised to suffer significant impacts include the Golden Eagle, Northern Harrier, White-tailed Kite, Ferruginous Hawk, Sharp-shinned Hawk and Burrowing Owl. Though some of these raptors (e.g., Sharp-shinned Hawk) are still common in the region, others are not. The Golden Eagle, for example, has declined so severely in southern California that only a few pairs nest regularly in Los Angeles County in remote hills and mountains far from urban development. Yet, no information is revealed about Golden Eagle in the region, other than that a note that it will suffer a significant impact following build-out. Because no raptor surveys were conducted that might have located nesting and foraging sites, we may never know whether this project will extirpate the Golden Eagle from Los Angeles County. Another rare raptor, the White-tailed Kite, may be nowhere more common in Los Angeles County than along the Santa Clara River - 2006 saw a half-dozen breeding pairs[26] which may be a majority of the total number nesting in the entire county. 64

5. Mitigation measures are insufficient to benefit impacted species.

The Landmark Village DEIR appears to rely on three main conservation strategies to minimize and mitigate impacts to sensitive species: 65

1. Preservation of a "Santa Clara River Corridor" (section 4.4-93)
2. Preservation of a "large block of relatively undisturbed habitats on higher elevations into the Santa Susana Mountains", which extends down to the Santa Clara River west of the site (section 4.4-93)
3. Avoiding disturbance to nesting birds during construction (described below)

[25] K.L. Garrett, Los Angeles County Museum of Natural History, *pers. comm.* Dec. 2006.
[26] T. Swift, Placerita Canyon County Park, *pers. comm.*, Dec. 2006.

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Mitigation for narrowing the riparian corridor in the project area should include the establishment of a large riparian reserve that includes a broad section of the intact riparian corridor from the channel to upland habitat. The reserve should contain existing mature cottonwood and willow forests that have been nearly extirpated from most of the river. The developer currently owns the last large area of this type downstream of the proposed project. 65

The DEIR includes almost no detail on proposed actions that would actually mitigate permanent and significant impacts *to* sensitive species that are known or suspected to occur on the site. Rather, it suggests that these impacts would be reduced because of proposed preservation of habitat along a corridor along the mainstem of the Santa Clara River and in the rugged hills on the southwestern corner of the site (the "High Country" and the off-site Salt Creek drainage). The Santa Clara River has been reasonably well-surveyed, but virtually nothing is known about the wildlife elsewhere on the ranch, in particular the High Country/Salt Creek area, which has apparently never been visited by an ornithologist.[27] This is especially troubling because very few sensitive bird species known to occur in areas proposed for development are also present in the High Country or Salt Creek areas[28]. Recent surveys turned up just five such species (compared with the 17 sensitive bird species known or likely to occur within proposed grading areas), and the DEIR provides no distributional or abundance information on these five. Since the DEIR fails to demonstrate that preservation of the High Country and Salt Creek areas is likely to benefit many of the species to be impacted by Landmark Village, the DEIR should not identify preservation of these areas as providing mitigation for significant impacts to these species. 66

Rather than suggesting meaningful mitigation that preserves sensitive species and habitats *where they occur*, the DEIR instead offers only vague guidelines to be followed should such mitigation projects be initiated, and proposes no specific remedies to offset what it ackowledges would be significant impacts to a variety of species and habitats. In fact, the DEIR relies on a single guideline, LV 4.4-8[29] as the sole mitigation action to be taken to reduce impact levels below significance for the majority of the affected sensitive bird species. 67

Rather than setting aside habitat for these species or directing development away from sensitive habitats (aside from the flood-prone riverbed and court-mandated rare plant reserves), LV 4.4-8 suggests simply delaying development activities (e.g., grading, landscaping) if nests are located during construction. Given that the federal Migratory Bird Treaty Act requires the exact same course of action, LV 4.4-8 has no practical effect. Once birds are finished nesting in the late summer or fall, construction and resultant habitat elimination would be permitted under this mitigation measure. 68

By failing to identify feasible measures to mitigate this project's many significant impacts to sensitive species, the DEIR clearly violates the requirements of CEQA. Mitigation recommendation LV 4.4-8 - delaying construction only where nests are found - is listed as the primary mitigation measure for nearly *20* bird species that occur or potentially occur on the site. Because LV 4.4-8 is insufficient as mitigation, we consider the following species to be especially vulnerable to significant impacts here: 69 70

[27] The DEIR relies upon a seriously flawed biological report by Dudek & Associates (2006) which included no bird surveys, only incidental sightings, many of the most common birds of the region (e.g., Greater Roadrunner, California Thrasher) are not listed as having been observed by Dudek biologists.

[28] Dudek & Associates 2006, p. 81-84.

[29] "Within 30 days of ground disturbance activities associated with construction or grading.. the applicant shall have weekly surveys conducted by a qualified biologist.. to determine if active nests ..are present in the disturbance zone..."

- Known to occur on Landmark Village site
  - Cooper's Hawk
  - Southern California Rufous-crowned Sparrow (*Aimophila ruficeps canescens*)
  - Lawrence's Goldfinch (*Carduelis lawrencei*)
  - Yellow Warbler (*Dendroica petechia*)
  - White-tailed Kite
  - Horned Lark
  - Yellow-breasted Chat (*Icteria virens*)
  - Least Bell's Vireo (*Vireo bellii pusillus*)
  - Loggerhead Shrike

70

- Potentially occurring[30]
  - Tricolored Blackbird
  - Bell's Sage Sparrow
  - Long-eared Owl
  - Western Burrowing Owl
  - Western Yellow-billed Cuckoo
  - Southwestern Willow Flycatcher
  - Summer Tanager
  - Coastal California Gnatcatcher

Even addressing only those species *known* (to the DEIR preparers) from the site, it seems highly unlikely that grassland-dependent species such as Loggerhead Shrike and Horned Lark would not suffer a significant impact following the destruction of their preferred habitat (grassland, cultivated fields, pastureland) on the site, as proposed by the project. While these birds might get a "reprieve" during construction (assuming their nests can be found and left undisturbed), once the project is built, they would have no place to return to nest in the future.

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Unfortunately, because so many species were so poorly surveyed (see above), we have no information on where their nests or consistent populations occur on the site, much less how to suggest mitigation to benefit them.

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5. The DEIR proposes an unacceptable magnitude of impact to sensitive bird species and their habitats.

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The Landmark Village DEIR actually presents two categories of impact; first, those to resources within the *entire* 10,000-acre Newhall Ranch development (including the Landmark Village) as addressed in the original Newhall Ranch Specific Plan. Impacts associated *only* with Landmark Village (the first phase of Newhall Ranch), are discussed later in the document[31].

Even after mitigation, the impacts from implementing Landmark Village would apparently still be significant, and include the outright elimination of over 3,000 acres of wildlife habitat, including two sensitive habitat types (coastal sage scrub and Valley Oak woodland); substantial

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[30] Evidence for Tricolored Blackbird, Bell's Sage Sparrow and Western Burrowing Owl occurring on the site is discussed above
[31] See sections 4.4-70 to 4.4-82.

12

impacts to 10 sensitive bird species (in the report); plus indirect and cumulative impacts that the preparers admit cannot be mitigated (Table 4.4-1)[32]. 74

Even without appropriate surveys for grassland species, nesting raptors, owls, or wintering birds the DEIR still predicts that many unavoidable, significant impacts will occur with the construction of Landmark Village. These admitted unavoidable impacts of only the Landmark Village site include:

1. "Permanent conversion" (i.e., elimination) of 267.27 acres of coastal sage scrub, a sensitive plant community. 75
2. "Permanent net loss" of 918.84 acres of wildlife habitat.
3. Loss of oak woodland and protected oak trees.
4. "Unavoidably significant" impacts to three bird species:
    a. Southern California Rufous-crowned Sparrow
    b. Northern Harrier
    c. White-tailed Kite

Even assuming that these effects represent the only significant impacts of implementing the Landmark Village project, two of these bird species, the Northern Harrier and White-tailed Kite, are sufficiently imperiled in the region to request more thorough surveys be conducted in appropriate habitat to determine their locations and/if they are nesting, and then possibly require a re-evaluation of the project design and its proposed mitigation. 76

The Northern Harrier is a grassland-dependent raptor that was historically common throughout southern California. It nests in extensive grassland, on the ground or in matted reeds, and requires short herbaceous vegetation (e.g., grass, short reeds, barren/cultivated land) for foraging. In Los Angeles County, is most numerous in the Antelope Valley, where it breeds locally (e.g., at the Piute Ponds). On the coastal slope of the county, recent (non-historical) breeding has been suspected only in the Puente Hills[33]. Birds are more widespread in winter, occurring in grasslands near Santa Clarita and in the Santa Monica Mountains, but are still highly localized and nearing extirpation in much of the Los Angeles Basin. The total breeding population of Northern Harrier in Los Angeles County is certainly fewer than 5 pairs, and breeding may not even occur every year. The discovery of nesting Northern Harrier on Newhall Ranch would be a significant discovery, and a "significant impact" to the population here should be avoided or mitigated. 77

White-tailed Kite is another grassland-dependent raptor, but unlike the harrier, it selects as nest sites tall, often isolated clumps of trees surrounded by short grassland for foraging. Known breeding areas in Los Angeles County are very few, and are restricted to remote areas of the Santa Monica Mountains, Santa Susanna Mountains, the Santa Clara River, and the Puente Hills. Occasional breeding occurs elsewhere in the Los Angeles area, such as within flood-control basins. The total population of this species in the county is low - well under 100 individuals during winter - with possibly as few as 10 breeding pairs each year. Therefore, we assert that a 78

[32] Sensitive bird species to be significantly impacted on Newhall Ranch, even after mitigation, include: Northern Harrier, Southern California Rufous-crowned Sparrow, Tricolored Blackbird, White-tailed Kite, Swainson's Hawk, Mountain Plover, Bell's Sage Sparrow, Ferruginous Hawk, Western Burrowing Owl, Sharp-shinned Hawk, and Golden Eagle; not all of these are considered by the DEIR as present on lands affected by the construction of Landmark Village, but rather are felt to occur on habitats elsewhere on the ranch.
[33] Cooper, D S. 2000. Breeding landbirds of a highly-threatened open space: the Puente-Chino Hills, California. Western Birds 31 213-234.

significant impact to this small population is unacceptable and should be avoided or properly mitigated. 78

6. The DEIR fails to provide the "full environmental context" mandated under CEQA Section 15125 (c).

All CEQA lead agencies have a responsibility to ensure the competence, thoroughness, and objectivity of the consultants retained to prepare CEQA documentation for a given project. This is a matter of due diligence, since certification of demonstrably inadequate CEQA documentation leaves the lead agency vulnerable to legal challenge by citizens who have no other recourse for achieving impartial, reasonable planning of their communities and natural open spaces. The deficiencies of the biological resources section of the Landmark Village DEIR are so pervasive that the most important points of contention identified herein probably cannot be resolved without prepartion of a revised DEIR. The revised document should be circulated for another round of public review. 79

SUGGESTED REMEDIES

We assert that *all* sensitive species that were not adequately surveyed during the preparation of the Landmark Village DEIR be re-evaluated and, if necessary, re-surveyed. As outlined below, this would specifically apply to the three taxa entirely overlooked in the preparation of the DEIR; nesting and wintering raptors; nocturnal species; and grassland-dependent species. The actual status of each, including nesting sites as applicable, must be addressed in an ammended DEIR before any impact analysis is attempted. Specifically, these species include:

1. California Condor (overlooked)
2. Golden Eagle (nesting raptor)
3. Cooper's Hawk (nesting raptor)
4. Ferruginous Hawk (winter-only; grassland obligate)
5. Northern Harrier (grassland obligate)
6. White-tailed Kite (nesting raptor)
7. Prairie Falcon (nesting raptor)
8. Short-eared Owl (overlooked; winter-only; grassland obligate)
9. Long-eared Owl (nocturnal)
10. California Spotted Owl (overlooked)
11. Burrowing Owl (grassland obligate)
12. Loggerhead Shrike (grassland obligate)
13. Horned Lark (grassland obligate)

80

Following this analysis, we suggest the adoption and implementation of reasonable mitigation to offset the projected impacts - as well as any new impacts discovered after surveys for the above species. Once satisfactory mitigation measures are identified and agreed upon, only then should Newhall Land use the guidelines set forth in the DEIR for implementing them; *the guidelines described in the DEIR, such as LV 4.4-8, do not constitute mitigation measures.* 81

Examples of appropriate mitigation could include the following actions: 82

- Permanent protection of a large agricultural reserve along Highway 126 maintained as cultivated fields or irrigated pastureland for grassland birds and other wildlife species. 82
- Adequate undeveloped buffers along tributaries, including seasonal streams, and a project-wide prohibition on the use of concrete culverts to replace these vital natural riparian systems. 83
- Establishment of permanent reserves for sensitive coastal sage scrub, grassland and riparian-dependent birds that are *consistent with existing concentrations of these species within the site boundaries* (requires initial and ongoing surveys for Northern Harrier, Loggerhead Shrike, Summer Tanager, Bell's Sage Sparrow, etc.). 84
- Establishment of ecological reserves or at least passive-recreation parks around raptor nesting and foraging areas, particularly for rare and declining species such as Northern Harrier, Golden Eagle, White-tailed Kite and Short-eared Owl. 85

In summary, based on our comments herein, we find that the avian analysis in the Biota section of this DEIR is inadequate and incomplete and request that, based on our specific recommendations above, a new EIR be submitted with additional data on bird species and appropriate mitigation measures. 86

Respectfully submitted,

Glenn Olson

Glenn Olson
Executive Director

cc: Garry George, Executive Director, Los Angeles Audubon Society
Marianne Slaughter, President, Ventura Audubon Society
Kris Ohlenkamp, President, San Fernando Valley Audubon Society

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D8. Letter from Audubon California, dated January 19, 2007

Introduction

One of the primary concerns of Audubon California (Audubon) centered on the adequacy of the survey data, especially that data relating to wintering special-status bird species and raptors. In an effort to address these concerns, Bloom Biological, Inc. conducted winter and spring surveys on all areas of the Landmark Village project site, as well as along the Santa Clara River upstream and downstream of the site. Specifically, qualified biologists conducted surveys along approximately 25 miles of the Santa Clara River and adjacent tributaries as well as the proposed impact area of the Landmark Village project site from February through June 2007. Surveys focused on special-status species, as identified by state/federal resource agencies and recognized conservation organizations. Both diurnal and nocturnal surveys were conducted and documented agency protocols were followed, when required, for surveys of certain bird species.

A total of 21 special-status bird species were observed during the course of the survey effort, including six special-status raptor species. A number of other common raptor species also were documented as nesting along or adjacent to the Santa Clara River. Most of the special-status species observed occurred within riparian habitat associated with the Santa Clara River, with some occurring within the adjacent uplands. The report prepared by Peter H. Bloom, Bloom Biological, Inc., documenting the methods and results of these surveys is found in **Appendix A** of this Final EIR.

In addition, Bloom Biological, Inc. has prepared a separate summary of late winter and spring survey results focusing on the California condor (*Gymnogyps californianus*). The surveys conducted from February through June 2007 on the Landmark Village project site and along 25 miles of the Santa Clara River and adjacent tributaries resulted in no observations of the California condor. Bloom concluded that while the condor has been documented as flying over Newhall Ranch, the Landmark Village project area is not currently nesting or roosting habitat for the condor, no condors are known to have landed within the project area, nor would the condor be expected to nest on the project area because it does not contain the essential elements that define suitable California condor habitat. Accordingly, Bloom has concluded that there are no direct impacts to the California condor as a result of the proposed Landmark Village project. Bloom also noted the potential for indirect cumulative impacts resulting from an increase in human population; however this potential for indirect impacts is not anticipated to be significant. The Newhall Ranch Specific Plan includes the dedication of the 4,200-acre High Country Preserve; an area that has the potential to be utilized in the future by condors due to its habitat characteristics. Additionally, Landmark Village is located along SR 126 at the lower western edge of the Santa Clarita Valley. Due to its elevation and proximity to urban uses it is unlikely that condors would utilize the

project site (Landmark) in the future. Bloom Biological's summary of the surveys relative to the California condor (July 2007) is found in **Appendix A** of this Final EIR.

Furthermore, Dudek & Associates (Dudek) conducted focused coastal California gnatcatcher (*Polioptila californica californica*; gnatcatcher) surveys. Specifically, qualified Dudek biologists conducted six protocol-level presence/absence surveys over the approximately 1,043-acre Landmark Village project area in spring 2007. The surveys were conducted in all areas of suitable habitat (i.e., California sagebrush scrub habitat and sagebrush sub-associations with less than 50% slopes). Based on the surveys conducted, no gnatcatcher were detected on site. In conjunction with the gnatcatcher surveys, Dudek biologists also observed 62 species of wildlife during the surveys, comprising two species of reptile, 49 bird species, nine mammal species, and two butterfly species. A full list of wildlife species observed during the surveys is provided in Appendix A of Dudek's report. Dudek's report on focused gnatcatcher surveys, dated July 9, 2007, is found in **Appendix A** of this Final EIR.

The Landmark Village Draft EIR, Section 4.4, Biota, also was substantially revised. Specifically, please refer to the Final EIR for the revised **Section 4.4, Biota**. In addition, please see the associated SEATAC Report, which is found in **Appendix A** of this Final EIR.

Response 1

This comment is an introduction to comments that follow. No further response is required.

Response 2

The comment refers to the ultimate build-out of the Newhall Ranch Specific Plan; however, the Specific Plan will not impact more than 10,000 acres, as suggested in the comment. As discussed in the previously-certified Newhall Ranch Revised Draft EIR (March 1999), the Newhall Ranch Specific Plan, of which Landmark Village is a part, includes preservation of the High Country SMA/SEA 20, the River Corridor SMA/SEA 23, portions of designated Open Areas, and the Salt Creek area, located adjacent to the western boundary of the Specific Plan in Ventura County, totaling nearly 6,700 acres. While the previously-certified Newhall Ranch Specific Plan Program EIR identified certain significant unavoidable project impacts on sensitive biological resources, the County Board of Supervisors determined that the benefits of the Specific Plan outweighed the potential significant unavoidable impacts and that such impacts were acceptable based on numerous overriding public benefits and considerations.

The remaining comments restate information contained in the Draft EIR, but do not raise an environmental issue within the meaning of CEQA. The comments will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However,

because the comments do not raise an environmental issue regarding the content of the Draft EIR, no further response is required.

Response 3

The comment is noted. No further response is required given that the comment does not address or question the content of the Draft EIR. Nonetheless, the comment contains several references to the Santa Clara River watershed and impacts to that watershed. In response to these and other comments, Dudek completed a comprehensive study of the Santa Clara River watershed. Dudek's Santa Clara River Watershed Study (June 2007) is found in **Appendix A** of this Final EIR.

In that study, Dudek analyzed the cumulative impacts of development including past projects, current land use zoning, and future and approved projects in the Los Angeles County portion of the watershed. Based on that analysis, Dudek found that while land conversion, in the form of agriculture, residential, commercial, and industrial urban uses, has occurred in the Santa Clara River Valley and adjacent foothills, and substantial future development will occur, the vast majority of the watershed is comprised of natural lands, and the additional impacts of the Landmark Village project, Newhall Land and Farming projects in general, and other planned and approved projects in the Los Angeles County portion of the watershed are relatively small in proportion to the overall watershed. Key findings of Dudek's study include:

- The Santa Clara River watershed is, and will remain, for the most part undeveloped – lands converted to agriculture and urban development comprise about 10 percent of the total watershed. Planned and approved projects in Los Angeles County (including the City of Santa Clarita) would increase the amount of development in the watershed by about 3 percent.

- The watershed has very substantial existing public lands and planned open spaces that will be protected in perpetuity. Based on current public lands and currently zoned open space, approximately 71 percent of the watershed (733,526 acres) is existing or zoned open space.

- Under current land use zoning, important biological and physical features of the overall watershed would be retained. The major vegetation communities (coastal scrubs, chaparral, non-native grassland, woodlands and forest, and riparian/wetlands) are still and will remain relatively common in the watershed.

- Newhall lands are a very small proportion (<2%) of the overall watershed and are limited to a small area in the southern portion of the watershed. Planned development on Newhall lands (including the Landmark Village project) would impact only 1 percent of the total watershed and would be 26 percent less than the amount of development allowed on Newhall lands under the current land use zoning.

- Planned development on Newhall lands is downstream of substantial existing, planned, and approved urban land uses in the City of Santa Clarita and the Valencia community and occurs in the

lower elevation areas of the watershed, thus protecting headwaters and upper portions of sub-basins within the watershed and the functions and values these sub-basins provide.

- Regional wildlife corridors and habitat linkages will be preserved in the watershed.

Although encroachment by past development (including agriculture) has caused habitat loss and fragmentation and impacts to species in the watershed, Dudek's watershed study compiled the development projects and assessed associated impacts in the watershed and concluded that the existing and proposed cumulative development in the watershed will not significantly impact sensitive biological resources, based on the findings noted above. In addition, Dudek's watershed study found that the Santa Clara River is still considered a natural river system and still provides habitat for several listed threatened or endangered species such as the listed least Bell's vireo, southwestern willow flycatcher, unarmored threespine stickleback, and arroyo toad, as well as a number of non-listed special-status species.

Response 4

The comment is noted. The methods and results of all biological investigations conducted within Newhall Ranch are disclosed during the environmental review process for each proposed project, as required by CEQA. Such information was disclosed as part of the environmental review associated with the Newhall Ranch Specific Plan Program EIR for the entire Newhall Ranch. In addition, the applicant no longer requires confidentiality agreements for plant and wildlife surveys conducted on its properties. Representatives of Audubon also toured the Landmark Village site and surrounding areas on October 25, 2006. No further response is required given that the comment does not address or question the content of the Draft EIR.

Response 5

Please refer to **Response 4**, above. In addition, all of the 2007 surveys performed on the Landmark Village project site or surrounding area are disclosed in **Appendix A** of this Final EIR. The Draft EIR, Appendix 4.4, also contains over ten bird survey reports, along with several other wildlife surveys.

Response 6

As described on pp. 4.4-11 through 4.4-13 of the Landmark Village Draft EIR, Section 4.4, Biota, known records were compiled and reviewed of the distributions of special-status plant and animal species prior to conducting any site-specific or focused surveys. The most recent versions of the California Natural Diversity Data Base (CNDDB) and the California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants were reviewed for the USGS 7.5 minute quadrangle on which the project site is

located and for the eight surrounding quadrangles. Information also was evaluated on species' known habitat associations relative to on-site vegetation communities. In addition, recent or historical reports or surveys were compiled and reviewed in order to document the existence of special-status plant and animal resources on nearby properties or land areas. The potential for these species to occur on the project site is addressed in Tables 4.4-4 through 4.4-7 in the Draft EIR, Section 4.4, Biota.

Response 7

The comment generally refers to portions of the project description for Landmark Village. A more comprehensive description is contained in the Landmark Village Draft EIR, Section 1.0, Project Description.

In addition, the comment refers to the project setting, claiming that the project site is "undeveloped wildlands." This is not correct. As explained in the Landmark Village Draft EIR, Section 2.0, Environmental and Regulatory Setting, pp. 2.0-1 through 2.0-4, the Landmark Village site is located within the approved Newhall Ranch Specific Plan. The Landmark Village tract map site is generally located due west of the confluence of Castaic Creek and the Santa Clara River. The northern bank of the Santa Clara River forms the southern boundary of the tract map site, and SR-126 defines the tract map site's northern boundary. The eastern boundary abuts Castaic Creek. The City of Santa Clarita is located east of the tract map site, just beyond I-5, approximately 1 mile from the tract map site.

The proposed tract map site is currently cultivated with row crops. Miscellaneous ancillary sheds used to store agriculture equipment are found on the site. Several dirt roads provide access to the cultivated fields. Multiple abandoned oil wells along with water wells also are disbursed within the tract map site. Land within the Adobe Canyon borrow site, Chiquito Canyon grading site, and along the utility corridor is generally disturbed by agricultural cultivation, cattle grazing, oil production, or contains native vegetation, including California sagebrush scrub habitat and sagebrush sub-associations. In short, the Landmark project area is not fairly described as "undeveloped wildlands."

The remaining comments address general subject areas, which received extensive analysis in the Draft EIR. The comments do not raise any specific issue regarding that analysis and, therefore, no more specific response can be provided or is required. However, the comments will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project.

Response 8

The comment addresses general subject areas, which received extensive analysis in the Draft EIR. The comment does not raise any specific issue regarding that analysis and, therefore, no more specific

response can be provided or is required. However, the comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. Nonetheless, in response to this general comment, the reader is referred to the Landmark Village Final EIR, revised **Section 4.4, Biota**. In addition, please see the associated SEATAC Biota Report, which is found in **Appendix A** of this Final EIR.

Response 9

The comment suggests that the proposed project will eliminate essentially all of the remaining agricultural land in the coastal slope of Los Angeles County. As indicated in the Landmark Village Draft EIR, these agricultural areas within Newhall Ranch are actively disked and disturbed as part of the on-going agricultural operations; however, the project site does not represent all of the remaining agricultural land "in the coastal slope of Los Angeles County."

Response 10

The Landmark Village Draft EIR, Section 4.4, Biota, Tables 4.4-5 through 4.4-7, discusses the habitat requirements for several rare special-status wildlife species in the region (e.g., northern harrier, merlin, California horned lark, ferruginous hawk, prairie falcon) and identifies agricultural areas and grasslands as habitat for these species. The discussion of impacts on several special-status wildlife species acknowledges the loss of agricultural land as habitat for those species (e.g., northern harrier, p.4.4-74; California horned lark, p.4.4-75). In addition, the Draft EIR, on p. 4.4-59, discusses wildlife habitat and includes the loss of agricultural land as part of the overall net loss of habitat for wildlife. Also, as noted on p. 4.4-60 of the Draft EIR, the Newhall Ranch Specific Plan Program EIR included the loss of agricultural land as part of the analysis of wildlife habitat as well.

Response 11

The comment restates information contained in the Landmark Village Draft EIR, but does not raise an environmental issue within the meaning of CEQA. The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not raise an environmental issue regarding the content of the Draft EIR, no further response is required.

Response 12

The comment refers to the Newhall Ranch Specific Plan area as a new city "between two major roosting areas of the endangered California Condor." No further information is provided and no reference is made to the content of the Landmark Village Draft EIR. Nonetheless, in response, the Landmark Village

project site is approximately 25 miles from the closest known condor nest. While condors will and do fly over the Santa Clarita Valley, they will rarely land for roosting or foraging, and the Landmark Village project area is not nesting or roosting habitat for the condor, and no condors are known to have landed within the Landmark Village project area in the last 25 years. See, Bloom Biological, Inc.'s summary of findings of survey efforts relative to the California condors (Final EIR, **Appendix A**).

Response 13

Please see **Introduction** and **Response 6**, above.

Response 14

The comment does not specify which surveys were "inadequate;" therefore, no further response is required. Nonetheless, please refer to the **Introduction**, above, for responsive information.

Response 15

The comment does not specify for which species the sensitivity status was mischaracterized. No further response is required.

Response 16

The comment does not specify which impacts to special-status bird species and their habitats were mischaracterized. No further response is required.

Response 17

The comment does not specify which mitigation measures were generalized and did not address species ecological needs. No further response is required.

Response 18

The comment does not specify how the Draft EIR "fails to provide the full environmental context mandated under CEQA." No further response is required.

Response 19

The comment expresses the opinions of Audubon. The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not address or question the content of the Draft EIR, no further response is required.

Response 20

The Landmark Village Draft EIR identified a total of 26 avian special-status species with some level of potential to occur on the Landmark Village site. These species were selected to be addressed in the Draft EIR because they were identified by the CNDDB, and other sources of information (see **Response 6**, above), as known to occur in the region, and because habitat occurs on the site that could potentially support these species either as residents, migrants, or winter visitors. Of these 26 species, nine were observed on the Landmark Village site based on avian and other taxonomic surveys (Draft EIR, Table 4.4-3). As indicated in Table 4.4-3, avian surveys have been conducted annually on Newhall Ranch, including the Landmark Village site, since 1993. The focus of most of these surveys was along the Santa Clara River; however, special-status bird species observed in adjacent upland areas or otherwise observed flying or soaring over the site were noted. In addition, any special-status bird species observed during the course of the numerous other surveys indicated in Table 4.4-3 that were conducted for various taxa (i.e., plants, reptiles, amphibians, mammals, etc.) were noted during those surveys.

In addition, little or no habitat occurs on the Landmark Village site for many of the special-status bird species known to occur in the region. In fact, agricultural fields comprise the largest percentage of land on the project site. These fields, when not in active cropland, are regularly disked as a weed abatement practice. Consequently, these fields provide little foraging habitat and essentially no nest habitat value for the special-status species known to occur in the project region.

Since preparation of the Draft EIR, and in response to Audubon's comments, additional surveys were performed in 2007. The work included additional avian surveys conducted by Bloom Biological Inc. These surveys occurred from February through June 2007. See, **Introduction**, above, for a summary of the results of these survey efforts. In addition, please refer to revised **Section 4.4, Biota**, of this Final EIR. The section has been revised to, among other things, include data from the surveys that took place in the winter and spring 2007.

Response 21

The CNDDB relies on data voluntarily submitted by field biologists. Nonetheless, it is widely used throughout the state as a source of information to identify special-status species potentially occurring within a given area. However, as discussed in the Landmark Village Draft EIR, it is only one source used in conjunction with other literature and data sources (see **Response 6**, above), as well as habitat assessments and field surveys by experienced biologists, to determine the potential of special-status species to occur.

Response 22

Neither the California condor, short-eared owl, nor California spotted owl has never been observed on the tract map site during over 14 years of avian surveys conducted on and near the project site, including recent focused bird surveys conducted on the site and adjacent areas by Peter Bloom, Bloom Biological, Inc., and two other ornithologists from February through June 2007. These latter surveys included a total of 29 days of surveys with 232 person-hours, and daylight surveys as well as dusk, dawn, and nighttime surveys. U.S. Fish and Wildlife Service published survey protocols also were followed to detect least Bell's vireo. The Bloom Biological, Inc. report documenting the methods and results of the 2007 surveys is included in **Appendix A** of this Final EIR. In addition, Bloom Biological, Inc. prepared a summary of its findings relative to the California condor. This summary is found in **Appendix A** of this Final EIR. Because of the relative lack of habitat for both the condor and the spotted owl on the project site, these species were not addressed in the Draft EIR. However, because they may rarely occur on the site, they have been added to **Table 4.4-7** (species not expected or rarely occurring on the site) in revised **Section 4.4, Biota**, of this Final EIR. Because only nesting short-eared owls are considered special-status by CDFG and these species are not known to nest in coastal southern California, this species was not addressed in the Draft EIR. However, because they may rarely occur on the site in the winter months or as a migrant, this species has been added to **Table 4.4-7** (species not expected or rarely occurring on the site) in revised **Section 4.4, Biota**, of this Final EIR. Because the site is not considered of particular biological importance to the short-eared owl or the California spotted owl, no significant impacts on these species would be expected as a result of project implementation.

Response 23

See **Response 22**, above. During over 14 years of avian surveys, which included raptors, conducted on and near the project site, California condor was never observed. Landmark Village contains no roosting or nesting habitat for this species and very little, if any, suitable foraging habitat (areas open and large enough to enable landing and take-off). Nonetheless, condor has been added to **Table 4.4-7** (species not expected or rarely occurring on the site) in revised **Section 4.4, Biota**, of this Final EIR.

In addition, Bloom Biological, Inc. summarized its findings relative to the California condor based on late winter and spring surveys performed in 2007. Based on that summary, Bloom Biological, Inc. has concluded that the Landmark Village project area is not nesting or roosting habitat, and no condors are known to have landed within the project area in the last 25 years. It was also concluded that Landmark Village has no nesting opportunities for California condors and that as the condor population increases, they may fly more frequently over the Landmark Village project area on their way to foraging opportunities, but, in large part, because of limited prey and reduced wind and thermals, the Landmark

Village project area does not contain the essential elements that define suitable California condor habitat. Accordingly, Bloom Biological, Inc., has concluded that no direct impacts to the California condor would occur as a result of the Landmark Village project.

Bloom Biological, Inc. also noted there is a potential for indirect cumulative impacts resulting from an increase in human population; however this potential for indirect impacts is not anticipated to be significant. See **Introduction**.

Response 24

As listed in the most recent version of the CDFG Special Animals (dated February 2006), only the nesting life stage of short-eared owl is tracked (and, therefore, considered of "concern") by the CDFG. This owl primarily nests in the northern half of California and it rarely occurs in the Santa Clara River valley as a migrant. Consequently, this species was not addressed as a special-status species potentially occurring on the Landmark Village site. The individual observed in the High Country area of Newhall Ranch in the fall of 2005, and the dead individual observed in December 2006 near I-5 were likely migrants due to the season (fall/early winter) observed. Both locations were off site from the Landmark Village site. In addition, no short-eared owls were observed during the recent February–June 2007 avian surveys of the site and surrounding area, which were conducted by Bloom Biological, Inc. Nonetheless, because this species could rarely occur on or adjacent to the site, this species has been added to **Table 4.4-7** (species not expected or rarely occurring on the site) in revised **Section 4.4, Biota**, of this Final EIR.

Weather conditions allow Newhall Ranch to engage in farming nearly year round. This is true regarding the agricultural fields on the Landmark Village site. When not active croplands, the fields are actively disked to inhibit weed growth during the limited time the fields are left fallow. While various raptor species may attempt to forage over these fields, the constant activity associated with soil preparation, planting, irrigating, maintenance, harvesting, and disking would likely not provide the conditions or time to establish a substantial prey base (e.g., rabbits, gophers, and other rodents) for raptors to such a degree as to be of substantial biological value as a source of food. Consequently, the agricultural fields on the Landmark Village site are considered to have very low potential to support special-status bird populations. Nonetheless, these fields were included in the February through June 2007 bird surveys conducted by Bloom Biological, Inc. on the project site. In addition, as previously stated, the loss of agricultural fields as a result of project implementation was included in the net loss of wildlife habitat, which is considered a significant, unavoidable impact in the Draft EIR (p. 4.4-60).

Response 25

The California spotted owl typically nests and forages in mature, multi-layered forest stands usually in shady canyons. Roost habitat is often oak woodlands, but also characterized by relatively mature trees with a dense, overhead canopy. It prefers to forage on forest species, most typically a variety of small mammals. No conifer forest habitat occurs on the Landmark Village site. As described on p. 4.4-20 of the Draft EIR, the only oak woodland habitat occurring on the site is that which occurs at the base of north-facing slopes in Chiquito Canyon and Long Canyon, totaling approximately 4.45 acres. These small woodland areas are dominated by coast live oak. Based on the habitat assessment conducted on the Landmark Village site, it was determined that the on-site woodlands are too patchy and sparse to support nesting pairs of the California spotted owl. In addition, no spotted owls were observed during the recent February–June 2007 avian surveys conducted by Bloom Biological, Inc., which included nocturnal searches and tape recordings of owls to elicit responses, of the project site and surrounding area. Nonetheless, this species has been added to **Table 4.4-7** (species not expected or rarely occurring on the site) in revised **Section 4.4, Biota**, of this Final EIR.

Response 26

The publication referred to in the comment as an authority on the sensitivity status of bird species in California is not a CDFG publication, was prepared by the Point Reyes Bird Observatory and, though submitted to CDFG for review, is unpublished. The Draft EIR relied on the most recent version of the CDFG Special Animals list (February 2006) as the published standard for species considered of special-status in California by resource agencies such as CDFG or USFWS. Of the eight species listed in the comment, only three (ferruginous hawk, long-billed curlew, and purple martin) are considered of "Special Concern" by CDFG. Of these, only certain life cycle stages are actually tracked by the CDFG—the nesting stage for long-billed curlew and purple martin, and the wintering stage for ferruginous hawk. The long-billed curlew only breeds in the northeastern portion of the state; therefore, the life cycle stage that is considered special-status would not occur on the project site. Although not observed on the site or surrounding areas during the February–June 2007 avian surveys conducted by Bloom Biological, Inc., because of the potential to migrate through or potentially winter on the site, this species has been added to **Table 4.4-7** (species not expected or rarely occurring on the site) in revised **Section 4.4, Biota**, of this Final EIR.

As noted in the comment, very few records exist of purple martin breeding in Los Angeles County, and most of the breeding colonies in the southern portion of the state occur to the north in the Tehachapi Mountains. In addition, the small and somewhat fragmented stands of oak woodland on the Landmark Village site are not typical of the more extensive oak woodland/savannah habitat associated with

breeding colonies of purple martins. Although not observed on the site or surrounding areas during the February–June 2007 avian surveys conducted by Bloom Biological, Inc., because the on-site oak woodlands represent marginal habitat for the purple martin, this species has been added to **Table 4.4-7** (species not expected or rarely occurring on the site) in revised **Section 4.4, Biota**, of this Final EIR.

Ferruginous hawk was listed in **Table 4.4-7** of the Draft EIR and acknowledged as an "infrequent migrant" to the region that could potentially forage or otherwise occur on the site in grasslands, agricultural fields, and open scrublands, and, thus, was analyzed in the Draft EIR. No ferruginous hawks were observed during the recent February–June 2007 surveys of the site and surrounding area, which were conducted by Bloom Biological, Inc.

The Swainson's thrush, Clark's marsh wren, grasshopper sparrow, and yellow-headed blackbird are not considered special-status species by CDFG or USFWS. Further, the Swainson's thrush and Clark's marsh wren are not even listed on the CDFG Special Animals list and were not observed during the February–June 2007 avian surveys conducted by Bloom Biological, Inc. The grasshopper sparrow and yellow-headed blackbird are only listed as of "local concern" on the CDFG list, while the black-chinned sparrow is considered a "bird of conservation concern" by the USFWS, of "local concern", and is on the Audubon Society's "watch list." The grasshopper sparrow, because it is listed on CDFG's Special Animals list, has been added to **Table 4.4-6** (species with potential to occur on the site) in revised **Section 4.4, Biota**, of this Final EIR. Because one individual yellow-headed blackbird was observed on site, it has been added to **Table 4.4-5** (observed species on or adjacent to the project site) in revised **Section 4.4, Biota**, of this Final EIR. Finally, the black-chinned sparrow has been added to **Table 4.4-7** (species not expected or rarely occurring on the site). Because of the lack of a recognized CDFG and/or USFWS sensitivity status for the Swainson's thrush and Clark's marsh wren, and low sensitivity status for grasshopper sparrow, black-chinned sparrow, and yellow-headed blackbird, any impacts on these species, should they occur on the site, would not be considered significant under CEQA.

All of these bird species are protected by the federal Migratory Bird Treaty Act and the state Fish and Game Code from harm or loss to individual birds, including young and eggs. Mitigation Measure LV 4.4-24 in the Final EIR (LV 4.4-8 in the Draft EIR) includes provisions for pre-construction and pre-grading nest surveys to be conducted to locate active nests of these and all other native bird species that would potentially be impacted by construction/grading. If such nests are found, measures are included such as establishing an appropriate setback from active nests and monitoring by a qualified biologist that will ensure that the adults, young, or eggs will not be harmed.

Response 27

See **Response 26**, above, with respect to species that were addressed in the Draft EIR and why focused surveys were not conducted for certain species.

Response 28

See **Response 26**, above, with respect to long-billed curlew.

Response 29

See **Response 26**, above, with respect to purple martin.

Response 30

See **Response 26**, above, with respect to grasshopper sparrow.

Response 31

Pages 4.4-11 and 4.4-13 of the Draft EIR describe the databases and historical and recent documents that were compiled and reviewed to identify special-status species potentially occurring on the Landmark Village site. Pages 4.4-14 through 4.4-17 document the various surveys that were conducted on the project site as well as the entire Ranch for various plant and animal taxa. Pages 4.4-38 through 4.4-50, including **Tables 4.4-5** through **4.4-7** describe and list the special-status wildlife species with some potential to occur on the project site or immediate area. Pages 4.4-70 through 4.4-82 describe potential impacts on these species and measures to mitigate those impacts considered significant under CEQA. This information is also reflected in revised **Section 4.4, Biota**, of this Final EIR.

Response 32

See **Response 31**, above, for a discussion of the overall approach taken in the Landmark Village Draft EIR with respect to special-status species. As discussed on p. 4.4-37, a total of 49 special-status wildlife species (including 26 avian species) were identified as known to occur in the project region and having some potential to occur on the Landmark Village project site. This was based on a review of the CNDDB and other documents (see **Response 6**, above) as well as on thorough assessments of on-site habitats to support special-status species known to occur in the region. As discussed on p. 4.4-46 of the Draft EIR, species for which suitable habitat did not occur on the site were eliminated from further consideration.

Surveys are generally targeted for those species that are considered of special-status by CEQA and for which impacts would normally be considered significant (see, list of Significance Threshold Criteria

beginning on p. 4.4-53 of the Draft EIR), and for which suitable habitat exists on the project site for the specific life cycle stage (e.g., nesting, wintering) that has been identified as "special-status." In particular, the surveys conducted by Bloom Biological, Inc., from February through June 2007, focused on all special-status bird species that are known to occur in the project region, for which the project site is included in the breeding or wintering range of the species, and for which suitable habitat exists on the site. Each of these species is listed in **Tables 4.4-5** and **4.4-6** of revised **Section 4.4, Biota**, of this Final EIR. Pages 4.4-70 through 4.4-82 of the Draft EIR describe potential impacts on these species and measures to mitigate those impacts considered significant under CEQA. Mitigation Measure LV 4.4-24 in the Final EIR (LV 4.4-8 in the Draft EIR) includes provisions for pre-construction and pre-grading nest surveys to be conducted to locate active nests of these and all other native bird species that would potentially be impacted by construction/grading. If such nests are found, measures such as providing adequate setbacks around active nests and on-going monitoring by a qualified biologist are included that will ensure that the adults, young, or eggs will not be harmed.

Numerous focused and general surveys were conducted on Landmark Village, and Newhall Ranch in general, that included the project site, and documented those species that were observed (see **Response 20**, above). As discussed in Table 4.4-3 of the Draft EIR, focused surveys were conducted for those species that are state- or federally-listed as threatened or endangered with potential to occur on the site, utilizing the appropriate agency-required survey protocol. Many special-status species not associated with protocol surveys would have been noted during the protocol surveys for target species if associated with similar habitat.

Responding to Audubon's statement that "conducting no surveys over large areas of the ranch that almost certainly would have yielded sightings of several species that could be impacted by the project," the Landmark Village EIR focuses on the Landmark Village project site, not the entire Newhall Ranch or other areas of the Newhall Ranch Specific Plan. The entire Newhall Ranch Specific Plan was the subject of prior environmental review in the previously certified Newhall Ranch Revised Draft EIR (March 1999) and the Newhall Ranch Revised Additional Analysis (May 2003).

Response 33

As stated in Table 4.4-3 of the Draft EIR, focused surveys for California gnatcatcher were conducted using the appropriate USFWS survey protocols. The 2007 surveys for California gnatcatcher conducted on the project site also followed USFWS protocols. No California gnatcatchers were observed during the course of the 2007 gnatcatcher surveys conducted by both Bloom Biological, Inc. and Dudek & Associates. The reports documenting the methods and results of these survey efforts are found in **Appendix A** of this Final EIR.

Response 34

See **Responses 22** and **23**, above, regarding surveys for California condor.

Response 35

See **Response 26** regarding ferruginous hawk and long-billed curlew. To address concerns in the comment that specific surveys were not conducted for wintering birds, additional surveys were conducted by Bloom Biological, Inc. from February to June 2007 that included the Landmark Village site, the Santa Clara River from I-5 to the Ventura County line, as well as lower Salt Creek, Potrero Canyon, an unnamed canyon south of Wolcott Way, lower Castaic Creek, and lower Chiquito Canyon. The report documenting the methods and results of this survey is found in **Appendix A** of this Final EIR. However, for the reasons discussed in **Response 32**, the results of these surveys do not change the conclusions of impact significance on bird species described in the Draft EIR.

Response 36

See **Responses 22** and **25** regarding surveys for spotted owl. Long-eared owl was listed in Table 4.4-6 of the Draft EIR as potentially occurring on the site, and was not observed during the 2007 surveys conducted by Bloom Biological, Inc. Potential impacts (which are considered significant pursuant to CEQA, absent mitigation) on this species are discussed on p. 4.4-75 of the Draft EIR. Nocturnal bird surveys were included as part of the February–June 2007 surveys conducted by Bloom Biological, Inc., the results of which are found in **Appendix A** of this Final EIR. However, for the reasons discussed in **Response 32**, the results of these surveys do not change the conclusions of impact significance on bird species described in the Draft EIR.

Response 37

The agricultural areas of the project site were included in the February–June 2007 bird surveys conducted by Bloom Biological, Inc. Grassland areas were observed during surveys conducted for a variety of common and special-status wildlife species (see, Draft EIR, Table 4.4-3) as well as during the 2007s surveys conducted by Bloom Biological, Inc. See **Response 26**, above, regarding ferruginous hawk and long-billed curlew; **Response 22**, above, regarding short-eared owl; and **Response 26**, above, regarding grasshopper sparrow. Ferruginous hawk is listed in Table 4.4-7 of the Draft EIR as expected to occur as a seasonal migrant (this species was not observed during the 2007 winter surveys); northern harrier is listed in Table 4.4-5 as having been observed on the project site (this species was also observed during the Bloom 2007 February–June surveys); burrowing owl is listed in Table 4.4-6 as potentially occurring on the project site and as having been observed in the project area (this species was not observed during the

2007 survey effort); California horned lark is listed in Table 4.4-5 as having been observed within the project site (it was also observed during the Bloom 2007 surveys); and loggerhead shrike is listed in Table 4.4-5 as having been observed on the project site (two were observed during the 2007 February–June surveys; this information has been added to **Table 4.4-5** in revised **Section 4.4, Biota**, of this Final EIR). Potential impacts on northern harrier, burrowing owl, California horned lark, and loggerhead shrike are discussed in the Draft EIR on pp. 4.4-74, 4.4-80, 4.4-75, and 4.4-76, respectively. Without mitigation, potential impacts on these species are considered significant.

Response 38

See **Response 20**, above, regarding all avian surveys conducted on the project site and on Newhall Ranch that included the project site. See **Response 32**, above, regarding pre-construction surveys that will be conducted for all avian species, including raptors. Cooper's hawk and white-tailed kite are listed in Table 4.4-5 of the Draft EIR as having been observed on the project site, and prairie falcon are listed in Table 4.4-7 as having potential to forage over the site. Cooper's hawk and white-tailed kite were observed during the Bloom 2007 February–June surveys; **Table 4.4-5** has been updated to reflect this information in revised **Section 4.4, Biota**, of this Final EIR. Pursuant to the results of the Bloom 2007 survey efforts, golden eagle (although not observed during those 2007 surveys) has been added to **Table 4.4-6** as not expected to nest on the site but that could occasionally forage over the site, in revised **Section 4.4, Biota**, of this Final EIR.

Response 39

See **Response 20**, above, regarding all avian surveys conducted on the project site and on Newhall Ranch that included the project site. See **Response 32**, above, regarding pre-construction surveys that will be conducted for all avian species, including raptors. See **Response 37**, above, regarding northern harrier. See **Response 26**, above, regarding Clark's marsh wren and yellow-headed blackbird. Each of these species were included in the Bloom 2007 avian surveys conducted on the project site and surrounding area.

Response 40

See **Response 20**, above, regarding all avian surveys conducted on the project site and on Newhall Ranch that included the project site. See **Response 32**, above, regarding pre-construction surveys that will be conducted for all avian species. The Bloom 2007 February–June surveys included coastal California gnatcatcher surveys within the coastal sage scrub habitat on the project site, and none were observed. In addition, Dudek & Associates conducted six protocol-level presence/absence surveys for the coastal

California gnatcatcher in the spring of 2007, and no gnatcatcher were detected on site. For the Bloom and Dudek reports, please refer to **Appendix A** of this Final EIR.

Response 41

Only 271 acres of coastal sage scrub occur on the Landmark Village project site (as opposed to the 1,820 acres stated in the comment). Nevertheless, all surveys conducted for coastal California gnatcatcher in 1999 that included the project site were done so in accordance with USFWS survey protocols for this species. In addition, surveys following USFWS protocols for coastal California gnatcatcher were conducted in the spring/summer of 2007 that included all suitable gnatcatcher habitat within the Landmark Village project site and surrounding area. No California gnatcatchers were observed during these survey efforts. The methods and results of these surveys are included in **Appendix A** of this Final EIR.

Response 42

See **Responses 40** and **41**, above. All sage and scrubland bird species observed during these surveys were recorded and documented and are found in **Appendix A** of this Final EIR.

Response 43

See **Response 20**, above, regarding the avian surveys conducted on the project site and on Newhall Ranch that included the project site. See **Response 32**, above, regarding pre-construction surveys that will be conducted for all avian species. While surveys were conducted in a variety of habitats, the focus was on the Santa Clara River corridor for avian species because all of the state-listed and/or federally-listed bird species potentially occurring on Landmark Village, except the California gnatcatcher, are associated with riparian habitats. The Bloom 2007 February–June surveys included surveys within the upland habitats on the site and, as noted in **Response 41**, above, California gnatcatcher surveys were conducted in suitable sage scrub habitat on the project site in spring and early summer 2007. No California gnatcatchers were observed during these survey efforts.

Response 44

It is unclear what the comment means by "status of sensitive species in the project area." Distribution status? Sensitivity status? However, the sensitivity status and the general location of each special-status species that was observed on the site are found in Tables 4.4-5 through 4.4-7 of the Draft EIR. (The same tables, with the same "status" information, are found in the revised **Section 4.4, Biota**, of this Final EIR.)

Response 45

As indicated in Tables 4.4-5 through 4.4-7 of the Draft EIR, a total of 26 special-status bird species was identified as known to occur in the project region. Of these, nine were observed on the Landmark Village site during the course of various surveys conducted on the site. The life cycle stage (i.e., breeding, migrating, wintering) of each species and its potential to occur on the project site are indicated in these tables. Please also see **Response 20**, above.

Response 46

For the purposes of CEQA, when a special-status species was observed on the project site, it was assumed that the species could occur throughout all suitable habitat on the site for that species. As discussed on pp. 4.4-54 through 4.4-55 of the Draft EIR, a habitat-based approach is generally used to determine whether or not alteration of a particular habitat type would cause significant impacts on each species. The sensitivity status of each species is also considered. In the case of the special-status bird species observed on the project site, including loggerhead shrike, the Draft EIR (pp. 4.4-73 through 4.4-81) concluded that, absent mitigation, the potential loss of active nests of these species as a result of habitat loss would be a significant impact under CEQA. See **Response 24**, above, regarding surveys within the agricultural areas of the project site, and **Response 32**, above, regarding pre-construction surveys that will be conducted for all avian species to ensure no direct impacts to nesting or roosting birds will occur.

Response 47

See **Response 46**, above. The Draft EIR (p. 4.4-75) concluded that, absent mitigation, the potential loss of active nests of California horned lark as a result of habitat loss would be a significant impact under CEQA. Mitigation Measure LV 4.4-24 in revised **Section 4.4, Biota**, of this Final EIR (LV 4.4-8 in the Draft EIR) includes provisions for pre-construction and pre-grading nest surveys to be conducted to locate active nests of these and all other native bird species that would potentially be impacted by construction/grading. If such nests are found, measures such as providing adequate setbacks around active nests and on-going monitoring by a qualified biologist are included that will ensure that the adults, young, or eggs will not be harmed.

Response 48

Of the ten special-status bird species not observed but identified as potentially occurring on the site, nine (the species identified in the comment) could potentially nest there. The Draft EIR (pp. 4.4-73 through 4.4-81) concluded that, absent mitigation, the potential loss of active nests of these species as a result of habitat loss would be a significant impact under CEQA. Mitigation Measure LV 4.4-24 in revised **Section**

4.4, Biota, of this Final EIR (LV 4.4-8 in the Draft EIR) includes provisions for pre-construction and pre-grading nest surveys to be conducted to locate active nests of these and all other native bird species that would potentially be impacted by construction/grading. If such nests are found, measures such as providing adequate setbacks around active nests and on-going monitoring by a qualified biologist are included that will ensure that the adults, young, or eggs will not be harmed. See **Response 46**, above.

Response 49

As indicated in Table 4.4-6 in the Draft EIR, the riparian obligate species discussed in the comment were not observed on the project site, despite numerous surveys, and are represented as only potentially occurring as the site is within the known range of these species and suitable habitat for these species occurs on the project site along the Santa Clara River. Since circulation of the Draft EIR, and in response to Audubon's comments, additional avian surveys were performed on the project site and surrounding area. Please see **Introduction**, above. The Bloom 2007 February–June surveys results in observations of the merlin. **Table 4.4.5** (special-status wildlife species observed on or adjacent to the project site) has been updated to include the merlin in revised **Section 4.4, Biota**, of this Final EIR.

The publication to which the comment refers as an authority on the sensitivity status of bird species in California is not a CDFG publication, was prepared by the Point Reyes Bird Observatory, and is unpublished. The Draft EIR relied on the most recent version of the CDFG Special Animals list (dated February 2006) as the standard source for species considered of special-status in California by resource agencies such as the CDFG or USFWS. Merlin is included on this latest CDFG list of Special Animals as a California Species of Special Concern.

Response 50

See **Response 36**, above, regarding long-eared owl.

Response 51

See **Response 37**, above, regarding burrowing owl. The grassland habitats on the site were included in the Bloom 2007 avian survey efforts of the project site.

Response 52

See **Response 20**, above, regarding all avian surveys conducted on the project site and on Newhall Ranch that included the project site. The survey results discussed in the Draft EIR focused on the Landmark Village site, not the whole of Newhall Ranch. See **Response 32**, above, regarding pre-construction surveys that will be conducted for all avian species.

Response 53

See **Response 24**, above, regarding surveys that were conducted within the agricultural areas of the project site. See **Response 20**, above, regarding all avian surveys conducted on the project site and on Newhall Ranch that included the project site. See **Response 32**, above, regarding pre-construction surveys that will be conducted for all avian species. See **Response 48**, above, regarding conclusions made by the Draft EIR concerning species such as tricolored blackbird that were not observed on the site but were determined to potentially occur there. While not observed on the Landmark Village site, including during the Bloom 2007 February–June surveys, tricolored blackbird were regularly observed in very small numbers in transit between nesting and foraging areas during surveys conducted along the Santa Clara River outside of the project site boundaries.

Response 54

As stated in the Draft EIR, p. 4.4-46, just prior to Table 4.4-7, this table lists species not expected to occur on the site "as a resident or nesting species." It includes several species that could occur on the site as a seasonal migrant or that would only forage on the site. Prairie falcon is listed in Table 4.4-7 of the Draft EIR (not Table 4.4-6 as stated in the comment). The table indicates that no suitable nesting habitat for this species occurs on the project site, but that it could forage on the site. The Bloom 2007 February–June surveys observed one adult flying over the project site.

Response 55

Nowhere in Table 4.4-6 are impacts to the prairie falcon discussed. As stated just prior to the table on p. 4.4-46, "as these species are not expected to breed, nest, or otherwise reside on or substantially utilize the project site, they are not discussed further in this document." Consequently, prairie falcon is not included in the discussion of potential impacts on special-status species. Based on the lack of suitable habitat, the Draft EIR's findings remain the same even after taking into account the Bloom 2007 February–June avian surveys.

Response 56

As stated on p. 4.4-46 of the Draft EIR, just prior to Table 4.4-7, this table lists species not expected to occur on the site "as a resident or nesting species." It includes several species that could occur on the site as a seasonal migrant or that would only forage on the site. Ferruginous hawk is listed in Table 4.4-7 as "an infrequent seasonal migrant" to the region, and because it does not nest in California, "is only expected to rarely forage or otherwise occur on the site." The off-site observations of this species, as

stated in the comment, which occurred after release of the Draft EIR, illustrate the infrequent winter status of this species in the region. None were observed during the Bloom 2007 February–June surveys.

Response 57

See **Response 54**, above, regarding the potential for prairie falcon to occur on the project site and **Responses 35** and **56**, above, regarding the potential of ferruginous hawk to occur on the project site. To address concerns in the comment that specific surveys were not conducted for wintering birds, an additional survey was conducted by Bloom Biological, Inc., from February to June 2007 that included the Landmark Village site, the Santa Clara River from I-5 to the Los Angeles County/Ventura County line, as well as lower Salt Creek, Potrero Canyon, an unnamed canyon south of Wolcott Way, lower Castaic Creek, and lower Chiquito Canyon. The Bloom report documenting the methods and results of these surveys is found in **Appendix A** of this Final EIR. For the reasons discussed in **Response 32**, above, the results of these surveys do not change the conclusions of impact significance on bird species described in the Draft EIR.

Response 58

See **Response 57**, above, regarding the loss of potential prairie falcon foraging habitat. See **Response 54**, above, regarding the potential for prairie falcon to occur on the site. One adult prairie falcon was observed during the Bloom 2007 winter surveys flying over the project site. However, for the reasons discussed in **Response 32**, above, the results of these surveys do not change the conclusions of impact significance on bird species described in the Draft EIR.

Response 59

See **Responses 46** and **48**, above, regarding potential impacts to both observed special-status species on the Landmark Village site as well as species potentially occurring on the project site. The comment may be confusing the Newhall Ranch Specific Plan Program EIR with the Landmark Village Draft EIR as potential impacts on all special-status bird species identified in the Draft EIR as occurring or potentially nesting on the site were identified as significant prior to mitigation.

Response 60

Contrary to the statements made in the comment, potential impacts on Cooper's hawk and yellow warbler are identified in the Draft EIR as significant, prior to mitigation (pp. 4.4-73 and 4.4-75, respectively). See **Response 46**, above, regarding surveys to determine distribution and location of special-status species addressed in the Draft EIR.

Response 61

As described on p. 4.4-2 of the Draft EIR, Table 4.4-1 summarizes the impacts on biological resources, the applicable mitigation measures, and the significance findings after mitigation from the *Newhall Ranch Specific Plan Program EIR*, not the Draft EIR for the Landmark Village site. It is offered as background information since the Landmark Village EIR is tiering from the previously certified Newhall Ranch Specific Plan Program EIR. Because not all species and habitats known to occur or potentially occur within the approximately 12,000-acre Newhall Ranch Specific Plan area would necessarily occur within the smaller Landmark Village project site, it is plausible that there will be differences in the findings regarding species presence and significance of impacts addressed in each EIR for the same species. This is the case for the Swainson's hawk described in the comment. While the Newhall Ranch Specific Plan Program EIR concluded that potential impacts on Swainson's hawk could occur, this species was not addressed in the Landmark Village Draft EIR as it was determined that this particular species would not occur (actively forage and/or nest) on the project site. However, because two individuals of this species were observed migrating over the site during the Bloom 2007 surveys, Swainson's hawk has been added to **Table 4.4-5** (species observed on or adjacent to the project site) in revised **Section 4.4, Biota**, of this Final EIR.

Response 62

See **Response 61**, above, with respect to the Swainson's hawk.

Response 63

The inclusion of mountain plover in Table 4.4-1 of the Newhall Ranch Specific Plan EIR is for the same reason as Swainson's hawk (see, **Response 61**, above). For the same reasons as Swainson's hawk, mountain plover was not identified as potentially nesting or actively utilizing habitat on the Landmark Village project site and, therefore, was not addressed in the Draft EIR. See, **Response 20**, above, regarding surveys conducted within the agricultural areas of the project site. Because of the potential, albeit marginal, for the species to potentially winter on the site, this species has been added to **Table 4.4-7** in revised **Section 4.4, Biota**, of this Final EIR. For further responsive information concerning winter bird surveys, please see **Introduction**, above.

Response 64

See **Response 61**, above, regarding the differences between species addressed in Table 4.4-1 associated with the Newhall Ranch Specific Plan Program EIR and those addressed in the Landmark Village Draft EIR. See **Responses 46** and **48**, above, regarding potential impacts to both observed special-status species

on the Landmark Village site as well as species potentially occurring on the site. The comment may be confusing the Newhall Ranch Specific Plan Program EIR with the Landmark Village Draft EIR as potential impacts on all special-status bird species identified in the Draft EIR as occurring or potentially nesting on the site were identified as significant prior to mitigation. The comment is again confusing Table 4.4-1 that is associated with the Newhall Ranch Specific Plan Program EIR with the Landmark Village Draft EIR with respect to impacts on golden eagle. This species was not initially addressed by the Draft EIR; the species has been added to **Table 4.4-6** as not expected to nest on the site, but that could occasionally forage on/over the site, in revised **Section 4.4, Biota**, of this Final EIR. See **Response 20**, above, regarding all avian surveys conducted on the project site and on Newhall Ranch that included the project site. See **Response 32**, above, regarding why focused surveys for certain avian species, including some raptors, were not conducted and pre-construction surveys that will be conducted for all avian species. See **Response 38**, above, regarding white-tailed kite. See, **Introduction**, above, for a discussion of additional 2007 surveys on the project site and surrounding area.

Response 65

As described in the Newhall Ranch Specific Plan Program EIR, essentially the entire Santa Clara River corridor within Newhall Ranch, including downstream to the Los Angeles County/Ventura County line, will be preserved. Where riparian habitat will be temporarily disturbed, the area will be restored. Small areas of habitat that will be permanently disturbed will be replaced through enhancement of similar habitat elsewhere along the River corridor. In addition, it should be noted that the Landmark Village tract map site has not "narrowed" the riparian corridor as stated in this comment. The Landmark Village project's southern boundary is consistent with the boundaries shown on the Newhall Ranch Land Use Plan found in the approved Specific Plan.

Response 66

Mitigation Measures LV 4.4-6 through 4.4-12 and 4.4-15 in the Final EIR (which include LV 4.4-2 through 4.4-6 in the Draft EIR) identify specific tasks and actions to be implemented to avoid or minimize impacts to special-status aquatic and riparian species. Mitigation Measure LV 4.4-24 in the Final EIR (LV 4.4-8 in the Draft EIR) includes provisions for pre-construction and pre-grading nest surveys to be conducted to locate and avoid active nests of special-status bird species and all other native bird species that would potentially be impacted by construction/grading. Mitigation Measure LV 4.4-22 in the Final EIR (LV 4.4-9 in the Draft EIR) includes pre-ground disturbance surveys and actions to be implemented to avoid harm to coast horned lizard, slivery legless lizard, coast patch-nosed snake, and five other special-status reptile species as well as American badger, San Diego black-tailed jackrabbit and San Diego desert woodrat. Mitigation Measure LV 4.4-27 in the Final EIR (LV 4.4-10 in the Draft EIR) describes specific actions to be

implemented to avoid impacts to special-status bat species. Mitigation Measure LV 4.4-21 in the Final EIR (LV 4.4-17 in the Draft EIR) includes specific actions to be implemented to avoid impacts to spadefoot toad. And Mitigation Measures LV 4.4-1, 4.4-3 and 4.4-24 in the Final EIR (LV 4.4-23, 4.4-20, and 4.4-19 in the Draft EIR, respectively) address actions to be implemented to minimize and/or avoid impacts to several special-status plant species.

A number of general and focused plant and wildlife surveys, as well as habitat assessments for special-status species, have been conducted within the Salt Creek area and the High Country SMA. Within the Salt Creek area, these include plant surveys conducted in 2003 and again in 2006, and wildlife surveys in 2005 and 2006. Plant and wildlife surveys were conducted within the High Country SMA in 2005 and 2006. The surveys resulted in a total of 86 species of wildlife that were observed, including 56 species of birds, seven reptile and amphibian species, 16 mammal species, and seven species of butterflies or moths. A large number of these species, including 35 bird species, occur or are expected to occur within the Landmark Village site.

The proposed preservation of habitat along the Santa Clara River, as well as habitat within the High Country SM/SEA 20 and Salt Creek corridor, is a provision of the certified Newhall Ranch Specific Plan Program EIR to offset the loss of similar habitat elsewhere in the Specific Plan area, including Landmark Village. As the Landmark Village Draft EIR is tiering from the Newhall Ranch Specific Plan Program EIR, these provisions were not included in the Draft EIR. Rather, the Draft EIR summarizes this mitigation information as provided in the Newhall Ranch Specific Plan Program EIR for impacts to similar habitat throughout the Specific Plan area.

The preservation, restoration, and enhancement of riparian habitat within the Santa Clara River corridor is expected to provide habitat for the same riparian species subject to habitat loss within Landmark Village. Likewise, much of the drainage and upland habitat preserved in the Salt Creek corridor is expected to provide habitat for the same species, given its relatively low elevation status, that are subject to habitat loss within Landmark Village. Because of the similarity of the upland habitat in the High Country SMA/SEA 20 to that within the Landmark Village site, preservation and enhancement of upland habitat within the High Country SMA/SEA 20 is expected to provide suitable habitat for most of the special-status species subject to habitat loss within Landmark Village. As previously stated, the net loss of wildlife habitat, including nesting, foraging, and winter habitat for special-status bird species, as a result of implementation of the Landmark Village project is considered a significant, unavoidable impact in the Draft EIR (p. 4.4-60) that cannot be mitigated to less than significant levels.

Response 67

As described in the Draft EIR, pp. 4.4-54 through 4.4-55, impacts on biological resources are analyzed both from a habitat perspective (because most plant and animal species, including those of special-status, are dependent on native habitats to satisfy various life cycle requirements), and from an individual plant and animal perspective when impacts to these resources, in and of themselves, could be considered significant or conflict with local, state, and/or federal statutes or regulations. The previously-certified Newhall Ranch Specific Plan Program EIR mitigation measures, as well as those from the Newhall Ranch Resource Management Plan, related to habitat preservation, restoration, and enhancement, that are included in the Draft EIR are intended to offset or otherwise minimize the loss of similar habitat within the Specific Plan area, inclusive of Landmark Village.

Response 68

Mitigation Measure LV 4.4-24 in the Final EIR (LV 4.4-8 in the Draft EIR) is intended to mitigate direct impacts to individual birds pursuant to CEQA (see the first significance threshold criteria, "Substantial adverse effect, either *directly* or through habitat modification, on any species…." [emphasis added]), and to comply with various state and federal regulations requiring no harm or mortality to native birds, including eggs and/or young (i.e., active nests). It is not intended to mitigate the loss of habitat (see, **Responses 65** and **66**, above, that address mitigation for loss of habitat) for these species.

Response 69

Each of the mitigation measures in the Draft EIR for biological resources, including special-status bird species, are identified and feasible. (See also, Final EIR, revised **Section 4.4, Biota**.) In fact, most of the habitat-associated measures have been previously approved by Los Angeles County as part of the Newhall Ranch Specific Plan Program EIR. There are 80 previously adopted Specific Plan mitigation measures relative to impacts on sensitive biological resources. There are also 34 additional mitigation measures incorporated into the Landmark Village Draft EIR. In total, the County has imposed, and likely will impose, 114 biota-related mitigation measures.

Response 70

See **Response 68**, above regarding the intent of Mitigation Measure LV 4.4-24 in the Final EIR (LV 4.4-8 in the Draft EIR). Based on the intent of this measure, the Draft EIR reasonably concludes that the potential direct loss of or harm to individuals of the special-status bird species listed in the comment can be avoided such that the potential significant impacts to these species will be reduced to less than significant levels. As such, mitigation measure is sufficient mitigation under CEQA.

Response 71

Direct impacts (i.e., loss of or harm to individual birds or eggs) on loggerhead shrike and California horned lark are addressed in the Draft EIR (pp. 4.4-76 and 4.4-75, respectively). The loss of grassland habitat is included in the discussion of the overall net loss of wildlife habitat, including for these two species (p. 4.4-56). The loggerhead shrike and California horned lark also do not use the same nest year after year; such species would nest in other grasslands, cultivated fields, etc. Dudek's Santa Clara River Watershed Study, June 2007 (Final EIR, **Appendix A**), identifies several such areas throughout the watershed.

Response 72

See **Response 46**, above, regarding survey efforts to quantify species distribution and nest locations. See also, **Introduction**, above.

Response 73

See **Response 61**, above, regarding the differences between species addressed in Table 4.4-1 associated with the Newhall Ranch Specific Plan Program EIR and those addressed in the Landmark Village Draft EIR. Nowhere in the impacts section (beginning on p. 4.5-53) of the Draft EIR is there a discussion of impacts to resources within the entire Newhall Ranch Specific Plan, other than to disclose when the impacts associated with Landmark Village are consistent with those disclosed in the Newhall Ranch Specific Plan Program EIR.

Response 74

The comment is not correct. The entire Landmark Village site is approximately 1,050 acres. A total of approximately 950 acres will be permanently developed as a result of project implementation, not 3,000 acres as stated in the comment.

Response 75

The avian surveys conducted by Bloom Biological, Inc. from February to June 2007 included all grassland habitats within the Landmark Village project site, nesting raptors, owls, and wintering birds. The significant unavoidable impact conclusions to southern California rufous-crowned sparrow, northern harrier, and white-tailed kite are those made by the Newhall Ranch Specific Plan Program EIR (see Table 4.4-1 beginning on p. 4.4-3 of the Draft EIR). In contrast, the Landmark Village Draft EIR concludes that potential direct impacts (loss/harm to individuals) can be avoided, resulting in less-than-significant impacts with implementation of Mitigation Measure LV 4.4-24 in the Final EIR (LV 4.4-8 in the Draft EIR).

Response 76

The avian surveys conducted by Bloom Biological, Inc. from February to June 2007 included focused searches for raptors and raptor nests, particularly for special-status raptors such as the northern harrier and white-tailed kite. All active nests and/or territories of these species were noted and mapped. The Landmark Village Draft EIR concludes that potential direct impacts (loss/harm to individuals) to these two raptors can be fully mitigated with implementation of Mitigation Measure LV 4.4-24 in the Final EIR (LV 4.4-8 in the Draft EIR).

Response 77

The avian surveys conducted by Bloom Biological, Inc. from February to June 2007 included focused searches for raptors and raptor nests, particularly for special-status raptors such as the northern harrier. An individual northern harrier was observed foraging adjacent to the Santa Clara River on three occasions in March south, east, and west of the project site. No nests and/or territories of this species were observed. As stated in the Landmark Village Final EIR, revised **Section 4.4, Biota, Table 4.4-5**, this raptor species likely only occurs in the area as a winter visitor or migrant. Potential impacts to northern harrier are discussed on p. 4.4-74 of the Draft EIR.

Response 78

The avian surveys conducted by Bloom Biological, Inc. from February to June 2007 included focused searches for raptors and raptor nests, particularly for special-status raptors such as the white-tailed kite. Several nests and/or territories of this raptor were observed and mapped during the 2007 survey efforts along the Santa Clara River to the east and west of the project site. This information has been added to the discussion of white-tailed kite in **Table 4.4-5** in revised **Section 4.4, Biota**, of this Final EIR. Potential impacts to white-tailed kite are discussed on p. 4.4-75 of the Draft EIR.

Response 79

The comment expresses the opinions of Audubon. The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not address or question the content of the Draft EIR, no further response is required.

Response 80

With regard to each of the species listed by Audubon: See, **Responses 20** and **22** through **26**, and **Response 32**, above, regarding pre-construction surveys will be conducted for all avian species. See

Response 22 through **23**, above, regarding surveys for the three "overlooked" taxa (California condor, California spotted owl, and short-eared owl). See **Tables 4.4-5** through **4.4-7** regarding the potential of various special-status raptor species to nest or winter on the site. For further responsive information concerning winter bird surveys, please see **Introduction**, above. See **Response 32** and **36**, above, regarding focused surveys for certain avian species, including nocturnal species. See **Response 37**, above, regarding surveys for grassland species. See **Response 46**, above, regarding survey efforts to quantify species distribution and nest locations on the project site.

Response 81

See **Responses 32**, **68**, and **70**, above, regarding Mitigation Measure LV 4.4-24 in the Final EIR (LV 4.4-8 in the Draft EIR).

Response 82

Agricultural and grassland habitat will be preserved within the High Country SMA/SEA 20 and Salt Creek Corridor areas. See **Response 9**, above, regarding the loss of agricultural lands. See also **Response 66**, above, regarding the preservation of upland habitat within the High Country SMA/SEA 20 and the Salt Creek Corridor areas.

Response 83

No tributaries occur within the Landmark Village project site except Castaic Creek along the eastern boundary of the site and Chiquita Creek along the western boundary of the site. No impacts will occur to either of these tributaries of the Santa Clara River as a result of implementation of the proposed project. Page 4.4-60, Section 1c, Setbacks from Riparian Resources, in the Draft EIR discusses the nature and extent of buffers that will be established between riparian systems and adjacent development. A minimum of 100 feet will be established as a setback from all riparian areas. For further responsive information regarding the buffer/setback area, please refer to **Response 4** to letter from Heal the Bay, dated January 22, 2007.

Response 84

See **Response 66**, above, regarding the preservation of upland habitat within the High Country SMA/SEA 20 and the Salt Creek Corridor area.

Response 85

See **Response 66**, above, regarding the preservation of upland habitat, that would include raptor nesting and foraging habitat, within the High Country SMA/SEA 20 and the Salt Creek areas. Preservation of habitat along the Santa Clara River corridor also will preserve suitable nesting and foraging habitat for many raptor species.

Response 86

The comment is noted. No further response is required given that the comment does not address or question the content of the Draft EIR.

Letter No. D9

TriCounty Watchdogs

...protecting mountain resources and communities in Kern, Los Angeles, and Ventura Counties.

TriCounty Watchdogs
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California 93225
www.tcwdogs.org

Mr. Daniel Fierros
Los Angeles County Regional Planning Dept.
320 W. Temple St.
Los Angeles, CA 90013

Date 1/19/07

Re: Landmark Village (Project No. 00-196-5), DEIR Comments

Dear Mr. Fierros,

Thank you for giving us the opportunity to comment on the DEIR for Landmark Village.

The DEIR is a very large and complicated document, and a comment period of only sixty days makes it virtually impossible for the public to give thorough and far-reaching comments. To make matters worse the DEIR refers at many places to the DEIR for the Newhall Ranch Specific Plan, another gigantic document that is difficult, if not impossible, to oversee in its entirety. As a consequence the whole procedure for these large projects strongly suggest that it is sufficient for certification if developers hire consultants to generate thousands of pages of documents. Documents that suggest expertise, and sometimes even have a tenuous and remote relationship to science, but are basically written in templates and characterized by bulk. We have no doubt that the CEQA guidelines have been followed, We just wanted to restate that the outcome of the process is quite unsatisfactory. 1 2 3

To keep our comments to within reasonable limits we concentrate on the Traffic/Access section of the DEIR . 4

In Section 4.7 we see that the traffic impact reports by Austin-Foust are somewhat dated. The main report in Appendix 4.7a dates from 2004. Since the traffic situation in the area is changing rapidly, this is not really up to date. The reports on impacts in Ventura County (Piru and Fillmore) are from April 2006, and are more pertinent. Since TriCounty Watchdogs is 5 6

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mainly interested in the Mountain Communities north of Castaic, we shall naturally concentrate on impacts on the I-5. This is also because the UCLA Center for Environmental Statistics is currently doing a study on I-5 traffic between SR-14 and SR-99, and the impact of current and future project developments in the corridor on traffic. The study is still in a preliminary stage, but we expect to get a clearer picture over the next two years. 6

Section 4.7, which is based on the reports of Austin-Foust, estimates that the three phases of the Landmark Village project cumulatively will generate about 42,000 average daily trips, of which about 30% would be internal trips. The Newhall Ranch project at buildout will generate 357,000 ADT's. Added to many other developments in the corridor, that is an enormous number of additional trips. 7

The DEIR assumes a growth factor of 2% for ambient traffic. That is not realistic for I-5 traffic. From 2004 to 2005 Average Annual Daily Traffic at the I-5 and SR-126 intersection, for instance, increased from 97,000 to 103,000, a 6% growth. Typical growth at other I-5 intersection in the Santa Clarita area is 4%, and the increase in truck traffic approaches 6%. See the Figure I at the end of this letter. Our information is based on Caltrans counts -- the Austin-Foust 2003 AADT figures (Table 4.7-5 in the DEIR, supposedly also from the Caltrans database) are considerably lower. 8

In the cumulative traffic impact section the DEIR only pays attention to projects that are "reasonably expected to be in place in 2007" and that are in the Santa Clarita area. That seems short-sighted, both in time and space. The GIS map in Figure 2 at the end of this letter shows planned developments, some of it with approved specific plans, that will impact traffic in the corridor between Castaic and the North San Fernando Valley. Centennial, 30 miles north of the project, will generate 400,000 ADT's at buildout, and it seems reasonable to assume that at least 50,000 will head south on I-5, and all of these will cross the intersection with SR-126. It is true that Centennial and similar projects have not yet been approved, and will take 25 years to completion, but it is certainly not proper planning to act as if they do not exist. SCAG and MTA to some extent take these projects into account in their long-term plans for Northern LA County traffic. 9 10

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The mitigations and project improvements proposed by the project consist of modifications of interchanges, adding traffic lights, and build surface roads within Santa Clarita. It seems to me that those local improvements do not solve the basic problem, which is that 200,000 cars and 30,000 trucks have to go daily in both directions through the Santa Clara River Valley and the Newhall Pass. Every development, certainly every large development, will add substantially to this total. And past experience, in Valencia and Santa Clarita, shows that developers and consultants widely overestimate the percentage of internal trips. 11 12

More generally, it is well known that trip generation models have poor predictive power. To quote Niels Bohr: "Prediction is very difficult, especially of the future." We argued above that the short-term and local perspective of the models implies poor prediction. Do the traffic flow models that compute LOS take the mega-container ships into account that are flooding the harbors ? What will the influence be of Centennial, Northlake, San Emidio New Town, Los Lomas, Gates-King, Riverpark ? What will happen to Magic Mountain ? Do the consultants and developers know that SCAG/MTA in their long-range plans propose to widen the I-5 from SR-14 to SR-126 to a sixteen-lane freeway ? What will then happen to the fancy new Newhall interchanges ? 13 14 15 16 17

Even if, and it's a big if, we take the trip generation and traffic prediction models seriously, they are clearly extremely localized in time and space, and they do not acknowledge that traffic flow on I-5 is both a large-scale and a long-term problem. And, as any commuter can testify, it is getting worse every year. 18

Sincerely,

Jan de Leeuw,

Executive Board, TriCounty Watchdogs

Distinguished Professor and Chair, UCLA Department of Statistics

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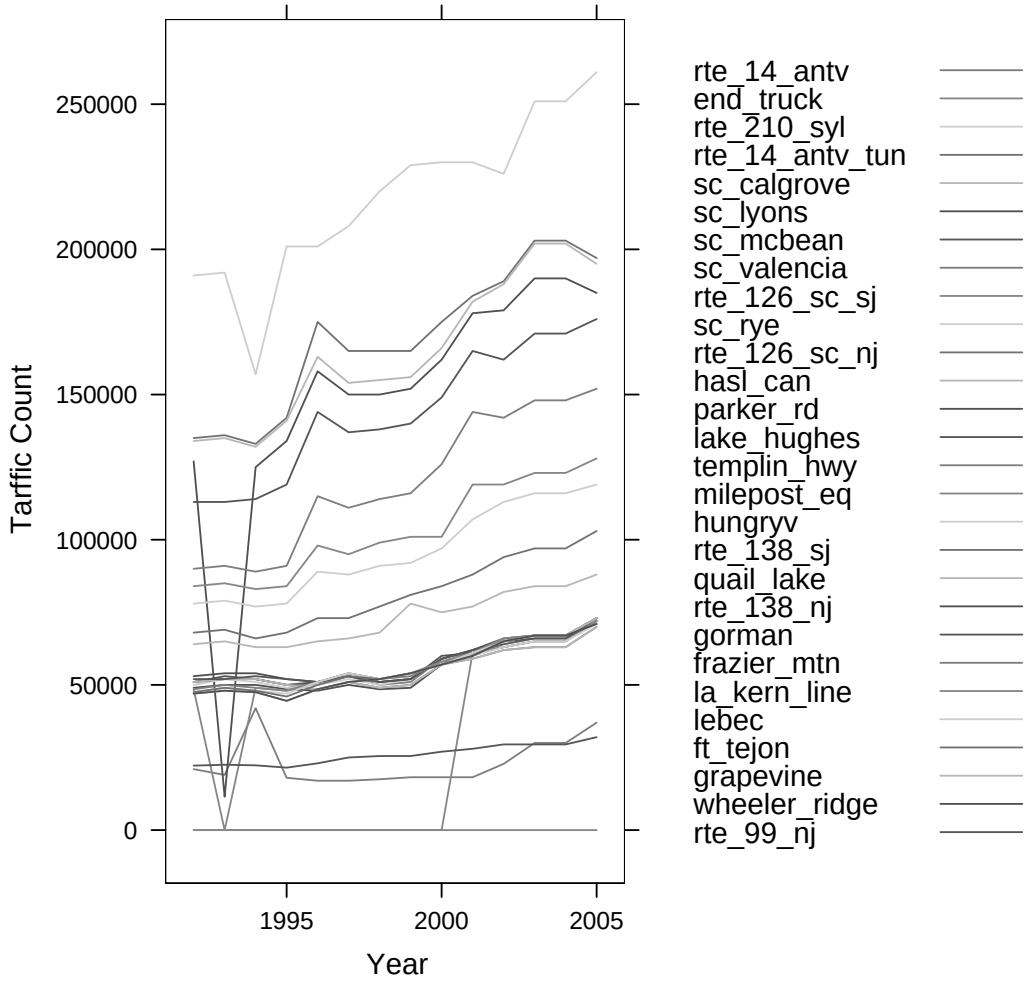

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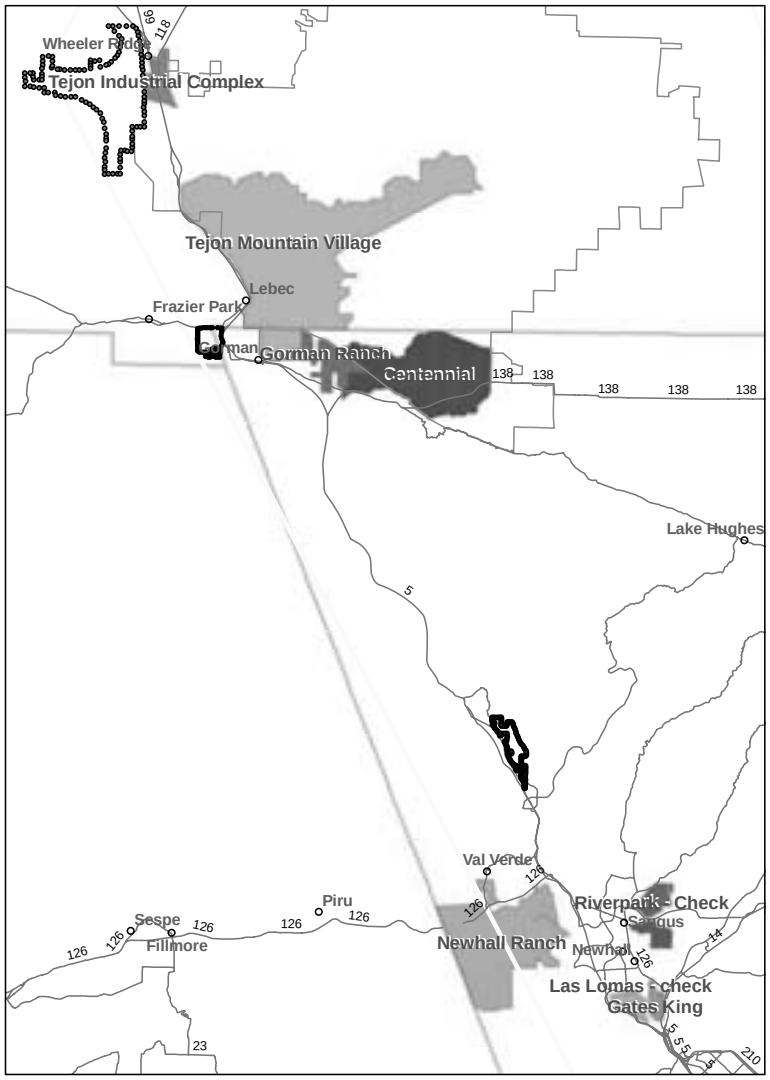
I-5 Corridor Housing Development Projects



Cartography by Sierra Club Angeles Chapter GIS Committee
Angeles.SierraClub.org/gis

D9. Letter from TriCounty Watchdogs, dated January 19, 2007

Response 1

The comment states that given the length of the public comment period it is "virtually impossible" to give "thorough and far-reaching comments." The comment expresses the opinions of TriCounty Watchdogs. Additional time has been provided for public review and comment. For further information responsive to the comment, please refer to **Topical Response 3**: Public Review Opportunities. The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not address or question the content of the Draft EIR, no further response is required.

Response 2

The comment refers to the certified Newhall Ranch Specific Plan Program EIR and associated documents, stating that reliance on these documents, because of their size, makes the review process difficult. The comment also questions the "science" found in the certified Newhall Ranch environmental documentation. The comment expresses the opinions of TriCounty Watchdogs. Additional time has been provided for public review and comment, which could have been used to facilitate review of the previously certified Newhall Ranch documentation. For further information responsive to the comment, please refer to **Topical Response 3**: Public Review Opportunities. The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not address or question the content of the Draft EIR, no further response is required.

Response 3

The comment states that TriCounty Watchdogs believe that the *CEQA Guidelines* have been followed, but believe the outcome of the process to be unsatisfactory. The comment expresses the opinions of TriCounty Watchdogs. The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project.

Response 4

The comment states that the traffic report (Draft EIR, Appendix 4.7) is from 2004, and, therefore, is somewhat dated. The methodology used in both the traffic report and the associated traffic section of the Draft EIR (Section 4.7) included use of a two percent ambient growth rate per year to account for background growth in ambient traffic (see Draft EIR, Section 4.7, p. 4.7-4). The ambient growth rate is a commonly used methodology for ensuring that the traffic report remains up-to-date. The rate was

derived by comparing existing traffic counts and future trip generation forecasts in the Santa Clarita Valley, as provided in the 2004 and 2030 Santa Clarita Valley Consolidated Traffic Models (SCVCTM). This allowed for the calculation of an average annual ambient growth rate based on existing traffic counts and future trip generation forecasts from the modeling work.

Response 5

The comment indicates that the traffic reports concerning impacts in Ventura County (Piru and Fillmore) are more pertinent than the project's traffic report, because they were from 2006. The comment expresses the opinions of TriCounty Watchdogs, which will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project.

Response 6

The comment indicates that TriCounty Watchdogs' primary focus is in mountain communities north of Castaic. The comment provides factual information regarding a study, which is still in the preliminary stages, being prepared by UCLA's Center for Environmental Statistics. According to the comment, the study is expected to provide a "clearer picture" in the future concerning impacts on the I-5. The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not raise an environmental issue regarding the content of the Draft EIR, no further response is required.

Response 7

The comment accurately restates the trip generation forecasts of the proposed project.

Response 8

Ambient growth factors, as defined by the Los Angeles County Department of Public Works (LACDPW) for the use of traffic studies, do not include future increases in traffic due to cumulative development. In other words, ambient growth is a subset of the total projected increase in traffic, which is made up of ambient growth plus growth due to future development. A comparison of historical traffic counts, as cited in the comment, should result in an average annual growth rate that is greater than the ambient growth rate factor since the historical growth also includes increases due to new development. In accordance with LACDPW requirements, the Draft EIR traffic study utilizes an ambient growth factor to evaluate a hypothetical scenario of a stand-alone "project only" impact. Project impacts under a cumulative scenario are evaluated in a distinctly separate manner utilizing a travel demand model that estimates traffic growth based on cumulative land use and demographic projections. Regarding the 2003 average daily trip (ADT) volumes for I-5 that are cited in the Draft EIR traffic study, the volumes in Table

4.7-5 of the Draft EIR tabulate each direction (i.e., northbound and southbound) separately. When added together to form a volume that represents the total of both directions, the volumes are comparable to the ADT volumes cited in Figure I attached to the comment letter.

Response 9

In accordance with the LACDPW traffic study requirements, the Draft EIR describes the methodology used for assessing cumulative traffic impacts. On p. 4.7-6, the Draft EIR describes the short-term cumulative traffic setting that is based on the estimated development year of the Landmark Village project. As noted, for short-term cumulative traffic impacts, additional future traffic volumes from other development planned to occur in the area (related projects) are added to existing and ambient growth to analyze short-term cumulative traffic conditions. Related projects consist of future development that is reasonably expected to be in place based on the development year of the Landmark Village project. This short-term cumulative traffic analysis is intended to take into account short-term traffic conditions based on existing traffic counts (2003), plus seven years of ambient growth including other development planned to be in place by project build-out. This forms the basis for identifying potential 2010 traffic impacts under both 2010 traffic conditions without the project and with project build-out and related projects.

Because it is a short-term cumulative traffic analysis (2010), which takes into account related projects likely to be in place at or about the same time as the Landmark Village project, the proposed Centennial project, which is 30 miles north of Landmark Village, not yet approved, and, if approved, will likely take 25 years or more to complete, was not included in Landmark Village's short-term 2010 cumulative traffic analysis.

The Draft EIR also evaluated long-range cumulative traffic impacts. On p. 4.7-79, this long-range cumulative impacts analysis entailed build-out of all lands within the current land use designations in the County's Santa Clarita Valley Areawide Plan and the City of Santa Clarita's General Plan, plus the proposed Newhall Ranch Specific Plan, plus all known active pending General Plan Amendments requests for additional urban development in the County unincorporated area of Santa Clarita Valley and the incorporated City of Santa Clarita. The long-range cumulative traffic volumes, which included trips generated by the Landmark Village project, are illustrated in Figure 4.7-22 of the Draft EIR. The illustrated volumes were derived using the SCVCTM, version 4.1 model, and represent long-range (2030) cumulative traffic conditions.

Because the Centennial project is not within the County unincorporated Santa Clarita Valley area, nor the incorporated area of the City of Santa Clarita, it was not specifically included in the Santa Clarita Valley

model; however, projected trips from the north provided by SCAG are incorporated in that model, and those trips encompass a sufficient number of trips to include the long-term Centennial project, if approved. Therefore, the traffic impacts reported in the Draft EIR accurately account for the Centennial project.

Response 10

See **Response 9**, above.

Response 11

The project applicant has also committed to participate in capacity augmentation improvements on a fair-share basis for the I-5 freeway (reference Mitigation Measure LV-4.7-21) in the Draft EIR.

Response 12

The amount of internal trips is estimated using the LACDPW travel demand model for the Santa Clarita Valley.

Response 13

See **Responses 9** and **12**, above.

Response 14

LOS calculations prepared for the I-5 freeway take into account the percent of the vehicle mix that consists of trucks, which includes those trucks transporting containers to and from the harbor ports.

Response 15

The proposed development plans of each cumulative development project on record in the County Department of Regional Planning are included in the County's travel demand model used for the Draft EIR traffic study. Newspaper accounts of the intentions of the owners of Six Flags Magic Mountain indicate that the Magic Mountain site is planned to remain a theme park. The San Emidio New Town has reportedly lost its water entitlements and is now partially owned by a conservation group and, therefore, is not expected to develop as shown in the approved 1992 Specific Plan. According to the City of Los Angeles, a project EIR is being prepared for the Las Lomas project; however, a formal application has not been filed with the City. Based on information from the City of Los Angeles, the project is expected to undergo significant revisions; and, therefore, the project and its description are in a state of flux.

Response 16

The current Transportation Concept Report (TCR) for the I-5 freeway identifies a 16-lane concept (four mixed-flow lanes, two HOV lanes, and two truck lanes per direction) as the maximum reasonable development of a highway facility within the corridor (i.e., the Ultimate Transportation Corridor (UTC)). The TCR also identifies a Recommended Alternative (Alternative 2) which consists of a 12-lane concept (four mixed-flow lanes, one HOV lane, and one truck lane per direction).

Response 17

The recent and planned interchange improvement projects are based on designs that accommodate the TCR alternatives noted in **Response 16**, above.

Response 18

Traffic volume forecasts for the I-5 freeway shown in the Draft EIR traffic study indicate deficient conditions will occur within the Santa Clarita Valley without planned freeway improvements. The project applicant has committed to participate in capacity augmentation improvements on a fair-share basis for the I-5 freeway (see Mitigation Measure LV-4.7-21).

Letter No. D10

california water network

Carolee K. Krieger
president

Dorothy Green
secretary

Joan Hartmann
treasurer

Lloyd G. Carter
director

Malinda Chouinard
director

Yvon Chouinard
director

Jim Edmondson
director

Michael Jackson
director

Huey Johnson
director

Linda Mitrovich
director

Tom Stokely
director

1/20/07

Attention: Daniel Fierros
LA County Regional Planning Department
320 W. Temple St.
LA, CA 90012
Fax: (213) 217-5108

Re: Landmark Village Environmental Impact Report SCH No. 20040021002

On February 26, 2004, C-WIN requested that we be provided with all CEQA documents being circulated for review in the Santa Clarita Valley because of our concern over the adequacy of the State Water Project to supply new development in this high growth area.

The County has most graciously consistently complied with this request until now. Regretfully, we did not receive the Landmark EIR until January 19, 2007. The close of comment period as stated in the cover letter is January 22, 2007. It is not possible for us to provide you with an in depth analysis of this voluminous document in only 3 days. 1

We remain concerned about the adequacy of the water supply in Santa Clarita Valley and therefore would like to submit timely comments that will be circulated in the final EIR.

Therefore, we request that the comment period be extended by 60 days to give us sufficient time to review the EIR and provide you with our comments, concerns and suggestions.

Thanks you very much for your consideration.

Carolee K. Krieger, President

Jan 22 07 05:48p David & Carolee Krieger (805) 565-3394 p.1

D10. Letter from California Water Impact Network, dated January 20, 2007

Response 1

The comment requests that the comment period be extended by 60 days. Additional time has been provided for public review and comment. For further information responsive to the comment, please refer to **Topical Response 3**: Public Review Opportunities. The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not raise an environmental issue, no further response is required.

Letter No. D11

TriCounty Watchdogs

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Mr. Daniel Fierros
Los Angeles County Regional Planning Dept.
320 W. Temple St.
Los Angeles, CA 90012

Date 1/21/07

Re: Landmark Village (Project No. 00-196-5), DEIR Comments

Dear Mr. Fierros,

Thank you for giving us the opportunity to comment on the DEIR for Landmark Village.

The DEIR is a very large and complicated document, and a comment period of only sixty days makes it virtually impossible for the public to give thorough and far-reaching comments. To make matters worse the DEIR refers at many places to the DEIR for the Newhall Ranch Specific Plan, another gigantic document that is difficult, if not impossible, to oversee in its entirety. As a consequence the whole procedure for these large projects strongly suggest that it is sufficient for certification if developers hire consultants to generate thousands of pages of documents. Documents that suggest expertise, and sometimes even have a tenuous and remote relationship to science, but are basically written in templates and characterized by bulk. We have no doubt that the CEQA guidelines have been followed, We just wanted to restate that the outcome of the process is quite unsatisfactory. 1 2 3

To keep our comments to within reasonable limits we concentrate on the Traffic/Access section of the DEIR .

In Section 4.7 we see that the traffic impact reports by Austin-Foust are somewhat dated. The main report in Appendix 4.7a dates from 2004. Since the traffic situation in the area is changing rapidly, this is not really up to date. The reports on impacts in Ventura County (Piru and Fillmore) are from April 2006, and are more pertinent. Since TriCounty Watchdogs is 4 5 6

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mainly interested in the Mountain Communities north of Castaic, we shall naturally concentrate on impacts on the I-5. This is also because the UCLA Center for Environmental Statistics is currently doing a study on I-5 traffic between SR-14 and SR-99, and the impact of current and future project developments in the corridor on traffic. The study is still in a preliminary stage, but we expect to get a clearer picture soon. 6

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[illegible]

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www.[illegible]

The mitigations and project improvements proposed by the project consist of modifications of interchanges, adding traffic lights, and build surface roads within Santa Clarita. It seems to me that those local improvements do not solve the basic problem, which is that 200,000 cars and 30,000 trucks have to go daily in both directions through the Santa Clara River Valley and the Newhall Pass. Every development, certainly every large development, will add substantially to this total. And past experience, in Valencia and Santa Clarita, shows that developers and consultants widely overestimate the percentage of internal trips. 11 12

More generally, it is well known that trip generation models have poor predictive power. To quote Niels Bohr: "Prediction is very difficult, especially of the future." We argued above that the short-term and local perspective of the models implies poor prediction. Do the traffic flow models that compute LOS take the mega-container ships into account that are flooding the harbors ? What will the influence be of Centennial, Northlake, San Emidio New Town, Los Lomas, Gates-King, Riverpark ? What will happen to Magic Mountain ? Do the consultants and developers know that SCAG/MTA in their long-range plans propose to widen the I-5 from SR-14 to SR-126 to a sixteen-lane freeway ? What will then happen to the fancy new Newhall interchanges ? 13 14 15 16 17

Even if, and it's a big if, we take the trip generation and traffic prediction models seriously, they are clearly extremely localized in time and space, and they do not acknowledge that traffic flow on I-5 is both a large-scale and a long-term problem. And, as any commuter can testify, it is getting worse every year. 18

Sincerely,

Jan de Leeuw,

Executive Board, TriCounty Watchdogs

Distinguished Professor and Chair, UCLA Department of Statistics

TriCounty Watchdogs

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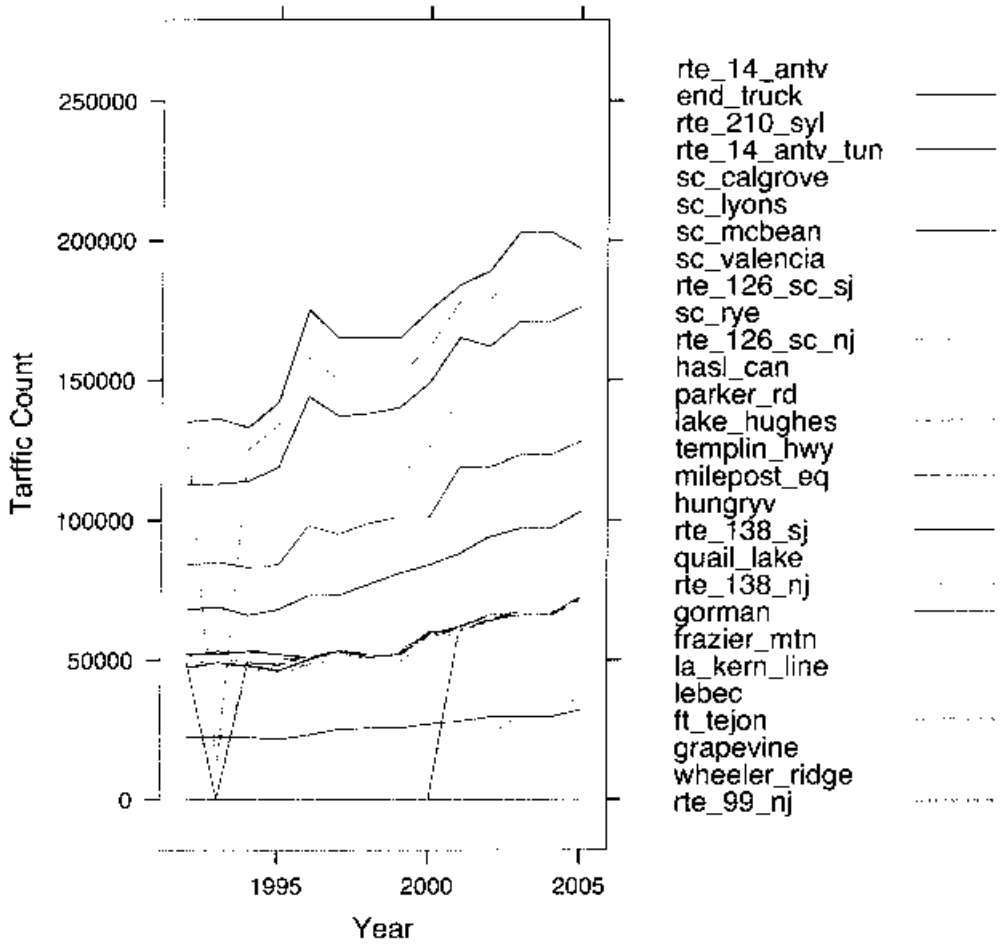

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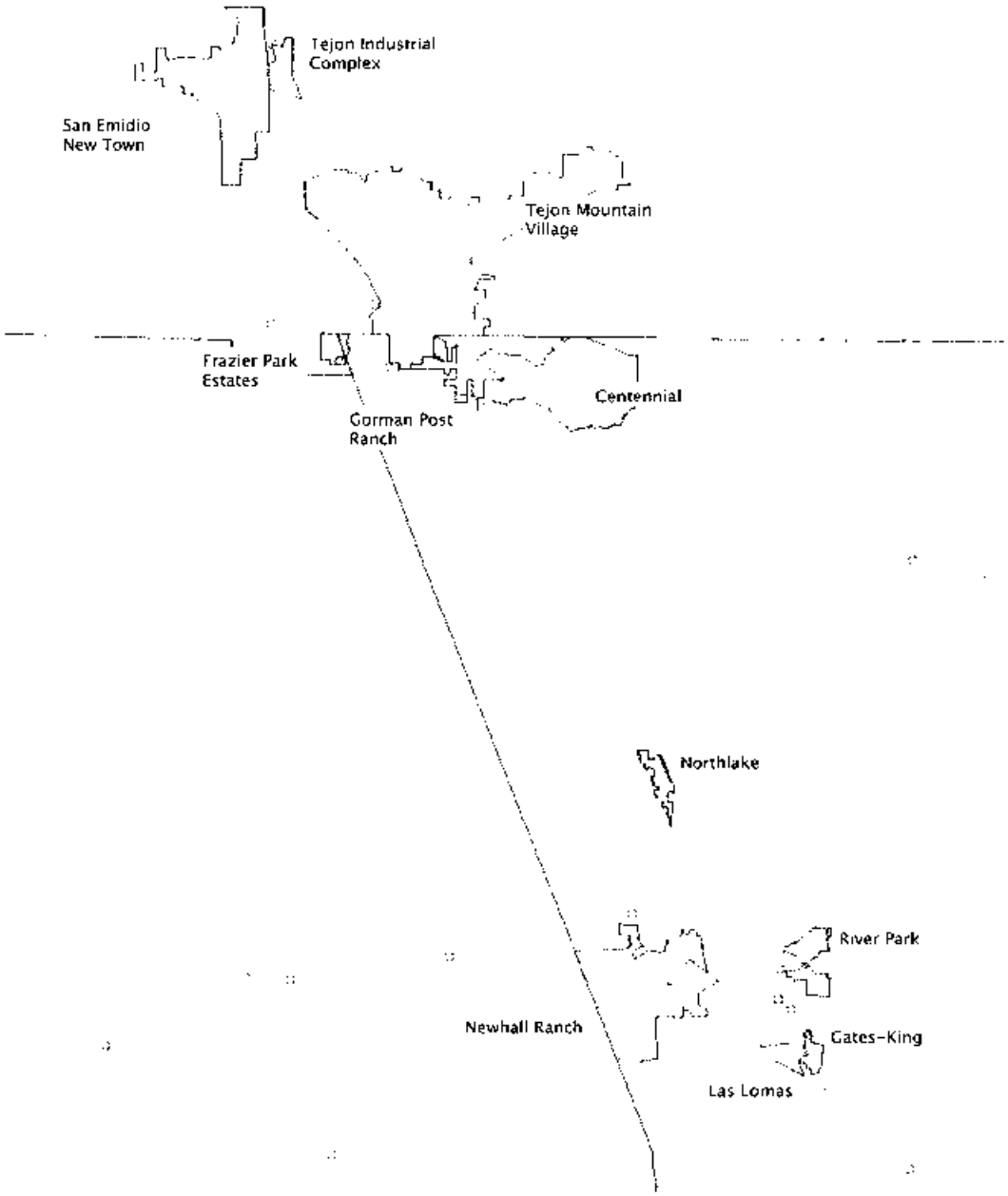

D11. Letter from TriCounty Watchdogs, dated January 21, 2007

Response 1

The comment states that given the length of the comment period it is virtually impossible for the public to give thorough and far-reaching comments. The comment expresses the opinions of TriCounty Watchdogs. And, additional time has been provided for public review and comment. For further information responsive to the comment, please refer to **Topical Response 3**: Public Review Opportunities. The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not address or question the content of the Draft EIR, no further response is required.

Response 2

See **Response 2** to letter from TriCounty Watchdogs, dated January 1, 2007.

Response 3

See **Response 3** to letter from TriCounty Watchdogs, dated January 1, 2007.

Response 4

See **Response 4** to letter from TriCounty Watchdogs, dated January 1, 2007.

Response 5

See **Response 5** to letter from TriCounty Watchdogs, dated January 1, 2007.

Response 6

See **Response 6** to letter from TriCounty Watchdogs, dated January 1, 2007.

Response 7

See **Response 7** to letter from TriCounty Watchdogs, dated January 1, 2007.

Response 8

See **Response 8** to letter from TriCounty Watchdogs, dated January 1, 2007.

Response 9

See **Response 9** to letter from TriCounty Watchdogs, dated January 1, 2007.

Response 10

See **Response 10** to letter from TriCounty Watchdogs, dated January 1, 2007.

Response 11

See **Response 11** to letter from TriCounty Watchdogs, dated January 1, 2007.

Response 12

See **Response 12** to letter from TriCounty Watchdogs, dated January 1, 2007.

Response 13

See **Response 13** to letter from TriCounty Watchdogs, dated January 1, 2007.

Response 14

See **Response 14** to letter from TriCounty Watchdogs, dated January 1, 2007.

Response 15

See **Response 15** to letter from TriCounty Watchdogs, dated January 1, 2007.

Response 16

See **Response 16** to letter from TriCounty Watchdogs, dated January 1, 2007.

Response 17

See **Response 17** to letter from TriCounty Watchdogs, dated January 1, 2007.

Response 18

See **Response 18** to letter from TriCounty Watchdogs, dated January 1, 2007.

Letter No. D12

Friends of the Santa Clara River

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Wishtoyo Foundation

January 21, 2007

Mr. Daniel Fierros
Los Angeles County Department of Regional Planning
Impact Analysis Section, Room 1348
320 West Temple St.
Los Angeles, CA 90012

Re: Comments on Draft Environmental Impact Report - Newhall Ranch, Landmark Village (County Project No. 00-196)

Dear Mr. Fierros.

Friends of the Santa Clara River submits the following comments on the subject project.

Areas of Controversy to be Resolved

At a minimum, there are several areas of controversy and issues to be resolved relative to the Newhall Ranch Project that neither the Specific Plan nor the DEIR sufficiently addresses. Most of these will be considered in the EIS/EIR now being prepared by the Army Corps of Engineers and California Department of Fish and Game (see comments below on EIS/EIR review). These issues need to be studied, understood, and mitigation defined for significant impacts prior to any approval of Landmark Village. Among these are: 1

- What is the long-term effect of stormwater runoff on the unarmored threespine stickleback and can this species survive continued floodplain alteration? 2
- What is the long-term effect of bank protection on the sediment dynamics of the river? 3
- What is the probability of success of riparian restoration and mitigation (see comments below on mitigation effectiveness)? 4
- Why can't alternative methods of bank protection be used and what is the justification for encroachment into the river floodplain when there are large areas of undeveloped uplands in the surrounding areas (see comments below on floodplain modifications and the need for larger buffer zones)? 5
- What are the cumulative impacts of multiple large development projects in the upper Santa Clara River, including Newhall Ranch and projects within the City of Santa Clarita, on the biological resources of the river corridor? 6

Water Quality

The DEIR comments on hydromodification (page 4.3-113) show once again that there is no real understanding of the cumulative potential for existing and future development along the Santa Clara River to cause detrimental hydromodification impacts. A larger, quantitative, regional study is needed. Until that study is complete and the impacts understood, we urge that no further projects, including Landmark Village and other Newhall Ranch Villages, be approved. 7

Biota

Friends is submitting a separate comment letter on biota, prepared by David Magney Environmental Consulting. 8

We also refer to the remarks of Dr. Jonathon Baskin (Reference 4), a recognized expert on aquatic species and the unarmored threespine stickleback (UTS) in particular. Dr. Baskin clearly explains his concern that the Newhall Ranch project will "negatively affect, and perhaps eliminate, the unarmored threespine stickleback."

Specifically, he states (Ref 4) "The sensitive biota of the river, including the UTS, arroyo toad, least Bell's vireo, etc., requires a habitat that is produced by a meandering stream. Meandering streams have a variety of shallow, slow flow habitats, as well as areas of faster flow, and during flooding overbank habitat is formed. A well-developed riparian corridor is essential to the birds, but is also important to the fish because it provides a refugium during high flows and its ecotonal nature increases productivity of the aquatic habitat. The sensitive aquatic species require good water quality, water free of sediments and chemical pollutants. The project documents do not provide adequate evidence that these conditions will be maintained if the project is implemented. 9

"The installation of buried and other bank stabilization will destroy the riparian vegetation upon which some species (birds, insects and others) depend. Revegetation at best takes many years to produce the mature plant community that support these organisms, and recent studies show that revegetation efforts, even if they succeed in restoring some of the ecosystem structure, fail to restore ecosystem functions. One reason for this failure is that the root systems of willows, mule fat and other vegetation hold the soil in place, and these root systems take many years, perhaps hundreds of years, to develop. Even when the above ground vegetation is flattened or removed by floods, the roots resprout rapidly. The proposed bank stabilization will destroy this root system for many miles of riverbank area. Revegetation cannot replace it, and the soil will be much more vulnerable to erosion. This will, in turn, destroy the remaining vegetation and what ever had developed, and greatly increase sediment in the river. This sediment is particularly harmful to gravel spawning fishes such as the Santa Ana sucker, and the southern steelhead, which inhabit the river further downstream, and to the bottom nesting UTS. Sediment smothers the eggs and nests of the UTS. Additional downstream impacts of sediment and other water quality parameters are inadequately addressed. Furthermore revegetation, even if successful, will tend to become uniform if the dynamic nature of the 10

river is impaired. The diversity of organisms associated with the riparian is maintained by the dynamic nature of the stream, which periodically disrupts patches of riparian habitat so that the corridor is a mosaic of habitats in various stages of ecological succession. Disruption of the disturbance regime will significantly reduce the biodiversity, including sensitive species such as the least Bell's vireo." 10

Adequacy of Mitigation

Recent studies have shown that wetlands mitigation is not working. A recent report (Reference 1: Ambrose, et.al., UCLA, August, 2006) studied 129 wetlands mitigation projects and found that "despite relatively high permit compliance, the vast majority of mitigation sites were not optimally functioning wetlands…In comparison to reference sites, only 19% of the mitigation files were classified as optimal, with just over half sub-optimal and approximately one-quarter marginal to poor." (Reference 1, page iii). Given the high reliance placed on wetlands mitigation to offset project impacts, we must conclude that wetlands loss, in general, is not being adequately mitigated in projects such as Landmark Village. Thus, we urge that a thorough review of project mitigation be carried out along with the establishment of sufficiently high mitigation ratios and adequate monitoring to ensure there is no net loss of wetlands in the project area. 11

Need for Larger Buffer Zones

The Santa Clara is the last major natural river remaining in Southern California, a region has already lost all but 3-5% of its pre-settlement riparian woodlands. The Newhall Ranch Environmental Impact Report states: "The Santa Clara River is a regionally significant biological resource. Its value is derived from the inherent value of the riparian habitats and associated species, from its function as a regional wildlife corridor, and because it is a natural river for most of its course". 12

The river's riparian corridor can properly be considered an ecological reserve, as per its designation by Los Angeles County as SEA#23. Reference 2 (*"Buffer Zones for Ecological Reserves in California: Replacing Guesswork with Science"* by Kelly and Rotenberry) considers needed width, or buffer, for ecological reserves such as SEA 23. Here is a key quote from Reference 2 (page 87): "Buffer design needs to be regarded as a key component of any integrated management strategy for sensitive species". In designing buffers, the UC Riverside scientists consider what processes are operating at the reserve boundary and to what extent those external forces are likely to penetrate the boundary and result in negative effects. Several potential forces are listed, including: (1) introduction of alien predators (particularly domestic cats and dogs), (2) increased nighttime illumination, (3) trespass, including pedestrian, equestrian, and off-road vehicles, (4) introduction of wildlife competitors, (5) pollution, and (6) disease transmission from domestic animals to wildlife. The paper illustrates the problem with an example of a wildlife reserve in Orange County. This reserve, which is up to a *mile wide* in places, is discussed by the authors as likely having *no interior area* immune from certain edge effects such as far-ranging pets, *even at a mile in width*. This reserve is much wider than the buffer allowed between the river trail (top of buried bank protection) 13

and the riparian vegetated zone in Landmark Village, which varies from zero to about 300 feet. Moreover, the EIR does not reference any studies concerning urban edge effects on riparian species. 13 14

A study by Stanford's Department of Biological Studies (Reference 3: Rottenborn, Stephen C., "Predicting impacts of urbanization on riparian bird communities) shows that the placement of urban uses in the vicinity of riparian zones has substantial impacts on riparian bird communities *out to a distance of 1500 feet.* Landmark Village setbacks range from zero to about 300 feet and thus fail to buffer the sensitive riparian resources of the project area. The Stanford paper's concluding paragraph contains the following statement: *"The single most important step that can be taken to conserve riparian communities in the face of urbanization is to minimize development in and along floodplains by maintaining broad buffers of undeveloped land between developed areas and riparian habitats."* 15 16 17

Floodplain modifications 18

Landmark Village, as proposed, will result in a loss of over 85 acres of river floodplain. The Los Angeles Regional Water Quality Control Board has recommended that Newhall Ranch avoid development in the floodplain and Friends agrees with that recommendation. The purpose of floodplains is to store floodwaters. Usurping the floodplain of a river can have serious immediate and long-term repercussions on the hydrology of the river and on channel morphology, both upstream and downstream (see comments above under Water Quality). Long-term impacts could include structural flood control measures of unknown magnitude which could be required in the future due to the cumulative effects of artificial reduction of the existing floodplain. The floodplain avoidance alternative would prevent these impacts and, if the project is eventually approved, this alternative or a lesser damaging environmental alternative, should be adopted. (See remarks above on hydromodification). 19 20

Traffic/Access

Friends will submit a separate comment letter on traffic impacts. 21

New Alternatives Needed 22

The proposed Landmark Village project includes construction of the Long Canyon bridge and an extensive section of buried bank protection downstream of the project for use in future phases of Newhall Ranch. These future phases will require separate EIRs and the extent to which they will be approved remains undetermined at this time. Both the bridge construction and the downstream section of bank stabilization will have significant impacts on riparian flora and fauna, and neither is actually needed for the great majority of the housing and commercial development within Landmark Village. A project alternative should therefore be developed that omits these parts of the project so that the impacts can be isolated and understood and a better determination made as to whether approval as part of the Landmark Village phase is warranted. 23

A second alternative should be developed which provides a minimum 500-foot buffer zone between the urban edge (top of the buried bank protection) and the riparian zone. Such an alternative would at least go part way towards reducing the urban edge effects discussed above under "Need for Larger Buffer Zones". 24

Cumulative Impacts

The unprecedented growth in the Santa Clara River watershed over the last few decades has caused an array of cumulative impacts to flora and fauna of the River corridor. Encroachment by development into the River floodplain and terrace lands has resulted in habitat loss and fragmentation and will inevitably be followed by a decline in species and loss of biological diversity. These cumulative impacts are not adequately addressed the DEIR. In its 1998 "Biological Opinion for the Valencia Company's Clean Water Act Section 404 Authorization for Portions of the Santa Clara River, Los Angeles County, California", the U. S. Fish and Wildlife Service (p. 33) states that "The potential increase in urbanization could result in alterations to the Santa Clara River through increasing the pollutant load reaching the river through runoff, human activity in the river, and introduction of additional exotic predators, all of which could adversely affect the unarmored threespine stickleback, southwestern willow flycatcher, and least Bell's vireo." Almost ten years later, the truth of this statement is evident as numbers of massive projects continue to impact the river. The DEIR must completely reexamine cumulative impacts of Santa Clara watershed projects and evaluate the effectiveness of mitigation for these impacts (see comments above under Water Quality). 25

EIS/EIR Review Document

We note with some puzzlement that the Landmark Village approval process is proceeding in advance of a major environmental review document that will impact the entire Newhall Ranch project. We refer to the EIS/EIR now being prepared by the California Department of Fish and Game and the Army Corps of Engineers that will govern the needed 1603 Stream Alteration Agreement and Corps 404 permit. This document, along with its associated public hearings and a finalizing process, could affect large sections of the project over which these two agencies have jurisdiction and could well result in major alterations. We therefore submit that project approval by Los Angeles County Regional Planning should be delayed until after such changes have been clarified and any associated alternatives evaluated. Sequencing project-level review after completion of the EIS/EIR could avoid needless staff time and expense if substantial changes are required in the project. 26

Conclusion 27

No approval for Landmark Village should be forthcoming until the DEIR is revised to account for the impacts discussed above. Cumulative impacts, in particular must be analyzed, understood and mitigated. If approval is granted, Friends recommends that the floodplain avoidance alternative, or an alternative less biologically damaging, be adopted. 28

Thank you for your consideration of these comments.

Sincerely,

Ron Bottorff

Ron Bottorff, Chair

References

1.Ambrose, R. F. et. al. *An Evaluation of Compensatory Mitigation Projects Permitted Under the Clean Water Act Section 401 by the Los Angeles Regional Quality Control Board, 1991-2002.* Department of Environmental Health Sciences, University of California, Los Angeles, December 2004.

2.Kelly, Patrick J. and Rotenberry, John T., *Buffer Zones for Ecological Reserves in California: Replacing Guesswork with Science,* in "Interface Between Ecology and Land Development in California". Southern California Academy of Sciences Symposium Proceedings: 1993.

3.Rottenborn, Stephen C., *Predicting the impacts of urbanization on riparian bird communities.* In Biological Conservation, v. 88, n.3, June, 1999, pages 289-299.

4.Personal email communication, Jonathan Baskin, Ph.D. to Ron Bottorff, February 28, 2003.

REF 1

An Evaluation of Compensatory Mitigation Projects Permitted Under Clean Water Act Section 401 by the Los Angeles Regional Quality Control Board, 1991-2002.

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Steven F. Lee

With technical assistance from:

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Prepared for:

State of California
California Environmental Protection Agency
California Regional Water Quality Control Board
Los Angeles Region (Region 4)
320 W. 4th Street, Suite 200
Los Angeles, CA 90013

December 2004

Executive Summary

In 2002, the Los Angeles Regional Water Quality Control Board (LARWQCB) obtained a grant from the Environmental Protection Agency (with matching state funds) to evaluate the success of compensatory mitigation projects associated with water quality certifications issued under Clean Water Act Section 401. The LARWQCB's objective was to assess how well the goal of "no net loss" of wetlands was being met in the Los Angeles region. Due to staffing limitations, the LARWQCB could not carry out this project internally, so they contracted with UCLA to perform the study. This report summarizes the results of the evaluation of Section 401 permits.

This project evaluated permit compliance and wetland functions in wetland compensatory mitigation projects in Ventura and Los Angeles Counties. All of the projects studied were granted permits requiring mitigation from the Los Angeles Regional Water Quality Control Board under Section 401 of the Clean Water Act. The assessment of mitigation projects included an extensive review of permit files followed by field monitoring to assess the condition of the habitat and map the area of the mitigation sites. This project was undertaken to help the Regional Board determine when and where mitigation wetland sites are likely to fail. By providing information about successful and failed mitigation sites, it will help the Regional Board determine an appropriate prioritization for proposed mitigation techniques.

Methods

The initial plans for this project called for a two-phase evaluation effort. Phase I was to involve an initial site reconnaissance visit for each of 50 permit files, including a permit compliance evaluation and a GPS (Global Positioning Satellite)-based survey of the site to determine mitigation project acreages. For a subset of 25 files, sites were to be visited a second time to perform a functional evaluation (Phase II), which would be more time consuming than the reconnaissance visit. After a series of early site visits, we determined that a substantial amount of time was required simply to understand the nature of the impact and mitigation projects and to determine the precise location and boundaries of the mitigation site(s). This, and the fact that individual permit files commonly involved several independent and distinct mitigation projects, meant that it was not feasible to perform a quick reconnaissance of several nearby projects on the same field day. In addition, during those early site visits, when we tested the use of our functional assessment evaluations, we determined that it would be feasible to perform the functional assessment for all 50 files, doubling the number of sites included in "Phase II." We decided, therefore, that it was much more efficient to perform both the initial compliance assessment and the functional evaluation on the same day, rendering a second visit unnecessary. Therefore, we combined the Phase I and Phase II assessments into a single site visit.

The central goal of this project was to assess compliance and function of a set of mitigation projects required by the Los Angeles Regional Water Quality Control Board (LARWQCB) under Section 401 of the Clean Water Act. We selected permits for

assessment based on a physical review of permit files archived at the LARWQCB office. To ensure a broad representation of mitigation project ages, we sought to complete a permit review with files stratified by year, with at least 20 permit files requiring compensatory mitigation per year from 1990 to 2003. Since key documents were frequently absent from the LARWQCB files, we supplemented our file survey by reviewing the file archives at the United States Army Corps of Engineers office in Ventura. As we went through each storage box in the search for files, the basic information from nearly 900 permit files was recorded. For 250 of the 319 files that contained mitigation requirements, photocopies of all pertinent information were made to facilitate our office and field assessments. A new Microsoft Access database was designed specifically for use on this project. Information from all 250 photocopied files was entered into this database, including basic project data, permittee, agent, location, impacts and mitigation, and permit conditions. All data collected through our office and field assessment of compliance, as well as all primary and supplemental data collected through the functional evaluations, were entered into this Access database. The GPS data were managed separately.

Fifty permit files to be included in our compliance and functional evaluations were selected randomly from the total population of 250 files with mitigation requirements. We conducted site visits at all mitigation sites associated with these 50 permits. At many sites, the site visit uncovered information indicating that the site was not suitable for assessment (e.g., the mitigation construction was still in progress): in all of these cases the file was removed from our list of 50 assessed files and replaced by an additional randomly chosen permit. In addition to these excluded permit files, there were five files for which compliance evaluations could be made, but where functional evaluations were not possible because of ambiguities in their in-lieu fee programs. Because we wanted a set of 50 fully assessed (Phase I and Phase II) files, an additional five files were added, resulting in a total of 55 files evaluated for compliance.

We determined the acreage of mitigation sites using a survey-grade GPS. To fulfill the acreage requirements mandated by the regulatory agencies, and given the resource limitations of the typical permittee, an individual permit file may have from one to four discrete mitigation project sites that may blend together several different habitat types (e.g., wetlands, alluvial scrub, riparian areas, etc.), and multiple mitigation actions (e.g., restoration, enhancement, preservation). Where possible, we distinguished between discrete mitigation sites, and these were surveyed and evaluated separately. Of the fifty permit files we assessed, 20 files had multiple discrete mitigation project types that yielded 79 individual mitigation site evaluations. Frequently, we were unable to determine the boundaries of a mitigation site although we could determine the general area: in these cases, we recorded a single GPS reading at the approximate location of the mitigation site.

Each permit file has a series of standard and special conditions associated with it specifying management actions or performance standards that must be accomplished in order to meet the compliance requirements of the permit. We define compliance as the percent of conditions met, as determined through our field and/or office assessment. We

assessed three different types of compliance: (1) compliance with the actual permit conditions; (2) compliance with "modern" permit conditions, the more inclusive and specific conditions that would have been imposed on older permits had they been processed recently; and (3) compliance with the mitigation plan, which is designed to accommodate the requirements of all agencies (e.g., U.S. Army Corps of Engineers and California Dept. of Fish and Game). For files with multiple mitigation sites, we evaluated compliance at each mitigation site separately, resulting in 79 field compliance evaluations. These were combined with the five permit files containing in-lieu fee payments for a total of 84 individual compliance evaluations. A subset of permit conditions often could not be assessed because of the age of the site or the nature of the condition; for example, it is not possible to determine if a site was mulched ten years ago.

The functional evaluations of the mitigation sites were conducted using the California Rapid Assessment Method (CRAM), modified specifically for this project (called UCLA-CRAM), along with supplemental information collected at each site. Supplemental assessments evaluated the success and appropriateness of the mitigation work, plant/habitat community characteristics, wetland conditions and jurisdictional habitat, and beneficial wetland/riparian services gained compared to what was likely lost at the impact site. Full functional assessments including CRAM, UCLA-CRAM and all other supplemental evaluations were performed for all 79 discrete mitigation projects. Analyses were performed either by mitigation site (all 79 sites) or by permit file (data from multiple sites combined for each of the 50 permit files) as appropriate. Digital photographs were also taken at each mitigation site.

Results

Ninety of the >200 LARWQCB storage boxes were inventoried. Within these 90 boxes, 887 permit applications were found from 1991 to the present, for which 601 permit certifications were issued, with 319 requiring some form of mitigation. Residential/urban development projects were the dominant project type permitted (35%), followed by flood control, bridge crossing, and bank/channel work projects (18%, 16%, and 16%, respectively). Pipeline/utility projects were about half again as common (7%), and the remainder of the project types were represented by just a few files each. Permanent impacts were twice as common as temporary impacts (66% compared to 33%). Restoration projects were the most common (46%) type of mitigation project, followed by creation (27%), enhancement (20%), and preservation (8%).

Sixty-nine percent of the sites (48 of 79 sites) complied with 100% of the (assessable) conditions; 31% did not comply with all of the permit requirements (Figure ES1). Only one site did not comply with any of the requirements. A much lower percentage of sites achieved 100% compliance with the modern conditions compared to the stated 401 permit conditions. This is to be expected since the permittee of a past project was not required to comply with the conditions typically included in more recently issued permits. However, 70% of the sites had compliance of 70% or higher, which is similar to the results for the stated permit conditions. Thus the majority of mitigation projects would have been in or near compliance with the set of modern permit

conditions, had they been required. Compliance with the mitigation plan was similar to compliance with the stated permit conditions: 67% of the sites achieved 100% compliance.

A summary of the compliance for individual conditions that were commonly specified in 401 permits is presented in Table ES1. The surveyed mitigation projects generally did well on revegetation conditions, with 100% of mitigation sites meeting the "presence of species specified for revegetation" condition and 94% meeting the "native vegetation present?" condition. These high rates of success can be attributed in part to the simple yes versus no (presence/absence) nature of the compliance evaluation for these conditions. Only two conditions were never found to be out of compliance: grading to pre-project contours, and the presence of specified plant species. Both of these conditions relate to the initial establishment of the mitigation sites, suggesting that the contractors constructing the mitigation are reasonably diligent. However, conditions relating to longer term maintenance and performance of the mitigation sites, such as maintenance in perpetuity and lack of exotic species, had much lower rates of compliance.

The total area lost permitted through these 50 permits was about 170 acres. This represents the acreage of "waters of the United States," including wetlands and non-wetland waters that were within the limits of federal jurisdiction as identified in Section 404 and Section 401 permits. The total acreage required to offset these losses was 233 acres, which would have represented a net gain of about 63 acres of wetland and other waters habitat (a gain/loss mitigation ratio of 1.38:1). The total area "gained" that we measured through our GPS survey was approximately 226 acres, assuming that 15 mitigation sites with undeterminable boundaries resulted in zero acres of gain each. Excluding the 15 sites with undetermined boundaries from our set of acreage calculations, the total acreage lost was 139.36, the total acreage required was 197.57, and the acreage "gained" was 226.12 acres, which exceeds the required acreage by 28.55 acres and yields a gain/loss ratio of 1.62:1.

These results suggest that, overall, mitigation projects in the Los Angeles region are meeting or slightly exceeding their acreage requirements. Therefore, it might be assumed that losses to wetlands and non-wetland waters permitted under Sections 401 and 404 of the Clean Water Act are being offset by adequate gains in acreage through compensatory mitigation requirements. However, a substantial proportion of these mitigation projects are enhancements and, to a lesser extent, preservation areas (which may increase or preserve function, but do not constitute gains in habitat). In addition, these results do not indicate whether the habitat type and ecological function lost at impact sites are being adequately replaced by comparable habitat and function at mitigation sites. These issues are discussed next.

The UCLA-CRAM functional evaluation method assessed 15 different metrics in four main categories of wetland functions or conditions. By assigning numerical values to the conditions for each metric, we were able to combine values to generate summary scores. The conditions at the 79 mitigation sites varied from 17% to 84% of the total

possible UCLA-CRAM points (Figure ES2). Twenty-three of the 79 sites (29%) had scores less than 54.2% of the total possible points, considered to be marginal to poor wetland condition. Fifty-three of the 79 sites (67%) were of sub-optimal condition, and only three sites (4%) exceeded 79.2%, the criterion for optimal wetland condition. Figure ES3 presents the distribution of scores for each of the four components of the UCLA-CRAM assessment. For the landscape context component, 34 sites (43%) were marginal to poor and 7 sites (9%) were optimal. For the hydrology component, 18 sites (23%) were marginal to poor and 7 sites were optimal (9%). For the abiotic structure component, 29 sites (37%) were marginal to poor and 14 sites were optimal (18%). For the biotic structure component, 31 sites (39%) were marginal to poor and 7 sites were optimal (9%) with respect to wetland condition. These scores are summarized in Table ES2.

The UCLA-CRAM functional evaluation indicates that few mitigation projects resulted in optimal wetland conditions overall (4%), while nearly 30% resulted in marginal to poor wetlands. Similar results were found for each of the four components of the assessment, with the mitigation projects most successful in the abiotic structure category, but even here achieving only 18% optimality. Of course, not all compensatory mitigation projects include wetland hydrology, biogeochemistry, and hydrophytic vegetation as target endpoints. In these cases, a CRAM score of 100% may not be an appropriate expectation, since it is based on the premise that a high-functioning natural wetland will have high condition scores in all categories. On the other hand, since the principle behind the Clean Water Act regulation is protection of wetland functions and values, and because the regulatory framework is focused on wetland habitats, we feel that the target endpoint of a 100% CRAM score is an appropriate benchmark. CRAM evaluations of "best attainable wetlands" in the region and typical pre-project sites would enable us to put the UCLA-CRAM scores in a better context, but such investigations were beyond the scope of this project.

We extended the scope of CRAM's assessment through supplemental qualitative assessments. Included in this collection are estimates of plant density and diversity, total native cover and total cover of invasive species, and the percent cover of *Arundo donax*, a particularly troublesome invasive plant in the Los Angeles region. We also focus on one relevant stressor, the influence of impervious substrate on the sites. Additional assessments were made that focus on how successful the mitigation project was with respect to its potential longevity, its ability to persist without artificial watering, and the overall quality of the habitat. The final three assessments consider how successful the mitigation activities were in replacing lost function, how successful the permittees were in satisfying their permit obligations, and how appropriate those permit obligations were in guaranteeing that the goal of "no net loss" of remaining wetland habitat and function would be met, as approved. The main findings for selected supplemental assessments are presented in this Executive Summary, with the full set of supplemental assessments presented in the main body of the report.

The supplemental assessments indicate that most compensatory mitigation sites are achieving high success with respect to their plant communities. This confirms our

general impression that the planting element of compensatory mitigation projects is the aspect of wetland replacement that both agency personnel and permittees focus on most.

For the "overall success of functional replacement" assessment, we considered what was actually accomplished at a mitigation site (the functional difference between the pre-mitigation state and post-mitigation state of the site) compared to the functional losses that likely occurred at the impact site (estimated through careful consideration of all available information regarding the site and project). Twenty three sites (29%) were successful, 10 sites (13%) were partially successful, while 46 sites (58%) were failures. The "overall success in achieving stated goals of mitigation plan/permit requirements" assessment considered whether or not the permittees adequately fulfilled their mitigation-related responsibilities, as outlined in the permits and mitigation plans approved by regulatory agencies. Forty two sites (53%) were considered successful, 10 sites (13%) were partially successful, and 27 sites (34%) were failing. Compared to the functional replacement assessment, the success scores for this assessment were higher by about 20 percentage points, indicating that many mitigation projects accomplished the goals set out for them but nonetheless failed to replace the lost functions from the impacted sites. From the results of these two assessments, one might conclude that the mitigation goals have not been set high enough to ensure that mitigation sites achieve the functions necessary to replace the impact site's functions adequately.

At each mitigation site, we assessed the approximate proportions of jurisdictional and non-jurisdictional habitat types that would have been recorded had formal wetland delineations been made at the mitigation sites. The results indicate that nearly half of the acreage at compensatory mitigation sites consisted of non-jurisdictional riparian and upland habitat. Upland habitat and riparian habitat that is beyond the limits of federal jurisdiction (waters of the United States) are not included in the estimates of habitat losses that result from the formal permitting process. Nor are losses to these habitats considered when determining the acreage requirement of Section 404, or 401 permits (although the riparian habitats that are beyond federal jurisdiction may be considered "waters of the state," and may thus be included in the acreage requirements of the California Department of Fish and Game Streambed Alteration Agreement). As a consequence, a simple balance-sheet approach to assessing no net loss, where acres impacted are compared to acres mitigated, can be misleading, since the loss acreage does not include non-waters habitats but the mitigation acreage does. A more complete accounting shows that a shift is occurring through the Section 401 permits whereby wetlands and other waters of the United States are being replaced to a certain extent by non-jurisdictional riparian and upland habitats. Jurisdictional wetlands themselves (as opposed to non-wetland jurisdictional habitat) appeared to have had a net gain in acreage through our 50 permit files. However, acreage gains were not evenly distributed among the permit files and over half of the files with wetlands impacts resulted in losses of wetland habitat. Our estimates of wetland habitat at mitigation sites represent the best-case scenario because we did not apply a strict three-parameter test, and the functions and services provided by these wetland habitats remains low.

Wetland protection under the Clean Water Act and the goal of "no net loss" is founded on the concept that wetlands and other "waters of the United States" provide valuable functions, values, and services that are important and beneficial to humans. Examples of such services include flood water storage, flood energy dissipation, biogeochemistry (e.g., water purification, nutrient cycling), sediment accumulation, wildlife habitat including aquatic wildlife habitat, and in some cases, groundwater recharge. To assess whether lost functions and services actually have been replaced by mitigation activities, we compared the services occurring at mitigation sites to what was lost through project impacts. For each of the services listed above (except ground water recharge, which is not relevant at most of our riverine sites), we considered what the realized gains were through mitigation activities and what the likely losses were at the impact sites. To analyze these data, we subtracted the loss score from the gain score for every service assessment, so zero represents complete replacement, negative numbers represent net losses, and positive numbers represent net gains. We will refer to the scale intervals as "service units." For each of the service category results given below, we consider success as meeting or exceeding full replacement (zero or higher score), and we consider failure as falling below a score of -1 service units. Partial replacement is defined as -1 service unit, or for the "totals" calculations, between this value and zero. Sites with service unit scores below -2 were considered "extreme failures."

The majority of the mitigation projects did not adequately compensate for services lost at the impact sites for five of the six types of services assessed; the one exception was flood energy dissipation, where 53% of the sites could be considered successful (zero or greater) at replacing the service (Table ES3). Replacement failed (< -1 score) at between 29% and 39% of the sites for the six services assessed. For each of the 79 mitigation sites, the data for the six types of services were averaged across all six categories to obtain a single value for services lost versus gained, per site. These results are presented in Figure ES4. As can be seen in this figure, the majority of the mitigation projects (66% or 52 sites) failed to compensate for the beneficial services lost through impact projects. Replacement could be considered successful for 27 sites (34%), with 20 sites (25%) achieving a net gain of services and seven sites (9%) having a net loss/gain of zero. Thirty-six sites (46%) failed to replace lost services, with 24 of these sites (30%) considered extreme failures.

A simple summary of mitigation success by acreage, permit conditions, and function is presented as a "by file" analysis (79 sites combined by 50 permit files) in Table ES4. Forty-six percent of permit files met or exceeded their acreage requirement and 60% successfully complied with their permit conditions. Among the files that had assessable permit conditions, all files met at least one assessable permit condition (and thus were judged partially successful), although 12 files (24%) failed to meet their acreage requirement. These results for acreage success are complicated by the fact that at a large percentage of sites, acreage determinations were not possible, either because the approximate boundaries of the site could not be determined or because no evidence of mitigation activities could be found. Even though the success rates for acreage and compliance were not high, the success rate for function was extremely low: only one site

was considered successful with respect to function. Clearly, success in meeting permit conditions does not ensure mitigation site function.

Although overall the acreage of mitigation exceeded the acreage of impacts, there are differences in the habitat types impacted and required for mitigation. Data from this study show that a net loss of wetlands and waters has been replaced by a net gain in riparian areas and terrestrial habitats as well as in-lieu fee mitigation (Figure ES5). This figure shows the number of instances of the various habitat types lost compared to the number expected to be gained from an analysis of the information in the permit files. These analyses show the mitigation habitat types proposed and subsequently approved, but may not reflect the actual habitat types present at mitigation sites. Large discrepancies between impacted and mitigation habitats occurred for vegetated and unvegetated streambeds, with more impacted than mitigated, and riparian and terrestrial, with more mitigated than impacted. (There were also more "other wetland" habitats impacted than mitigated, but this difference is likely due to mitigation plans naming specific wetland types.) Thus, it appears that streambed habitats are not being replaced as often as they are impacted, while habitat outside of the streambed (riparian and terrestrial) are included as mitigation more often than they are being impacted. This will lead to a shift in the distribution of wetland types in the landscape.

Of 250 permit files we reviewed, 16% involved in lieu fee payments. Complexities inherent in the in-lieu fee program, as currently implemented, have resulted in numerous problems with respect to both permit compliance and the assurance that the goal of "no net loss" will be met. Key weaknesses in the in-lieu fee process include problems with the timeliness of fee transfers, substantial delays in the implementation of mitigation projects by the in-lieu fee program administrator, transfer of money to an agency general fund rather than to a specific mitigation action, and use of in-lieu fee payments for projects that do not replace lost functions and services appropriately.

The concept of the in-lieu fee program is valid. In-lieu fee programs can take advantage of economies of scale and the consolidation of small mitigation requirements into a larger effort that is more likely to succeed. However, compliance cannot be assured without adequate oversight and accounting, and "no net loss" will not be achieved unless appropriate mitigation projects are undertaken. The most difficult problems with in-lieu fee programs stem from the absence of a direct connection between the resources lost versus those gained from mitigation. Simple payment of fees facilitates the loss of this explicit link, exemplified by payments to a general program without any clear accounting for what the fees produced. In these situations, how can the amount of any particular fee payment (rather than a smaller or larger one) be justified? An explicit link between losses and gains is fundamental to the proper application of mitigation policy; in-lieu fee programs must be implemented in a way that maintains this link. Most current in-lieu fee arrangements do not.

In conclusion, the Section 401 has not achieved the goal of no net loss of habitat functions, values and services in the Los Angeles region. The root of this shortcoming lies with a lack of explicit consideration of the full suite of functions, values, and services

that will be lost through proposed impacts and might be gained through proposed mitigation sites and activities. This begins with the drafting of compensatory mitigation proposals by permittees or their consultants that have little or no chance of meeting the "no net loss" goal. But ultimately it is manifested in the conditional approval of those mitigation measures by regulatory staff. There are certainly instances where inadequacies of subsequent mitigation plans, acreage shortfalls and other compliance issues contribute to net loss on an individual permit file basis. These problems frequently go unnoticed due to a lack of regulatory oversight and enforcement. However, our results demonstrate a much higher rate of success for compliance with permit conditions and acreage requirements than for replacement of lost wetland functions and services. Improving the protection of wetland resources will require a more careful scrutiny of mitigation plans to ensure they adequately replace lost habitat types, functions and services and the application of permit conditions that ensure that mitigation habitats provide appropriate functions and services.

The guidance document associated with this report discusses a number of the issues raised during our evaluation of 401 permits and provides a number of recommendations on ways the current Section 401 process might be improved to increase the success of compensatory mitigation.

Table ES1. 401 Permit Condition Analysis including the percent of sites where these conditions were specified and met (% of sites in compliance) and the percent of sites where these conditions were specified, but there was not enough evidence to determine whether they were met (% of sites where compliance was undeterminable). This analysis includes the 70 sites among 49 files at which 401 Permit Compliance was evaluated.

401 Permit Conditions	% Met	% Not Met	% Undetermined
Mitigation has been maintained in perpetuity?	72	16	12
Grading to pre-project contours?	88	0	12
Exotic plants absent?	16	84	0
Evidence of exotic plant removal?	41	41	18
Minor impact of exotics on site?	78	22	0
Is native vegetation present?	94	6	0
Is there evidence of restorative planting?	73	18	9
Presence of species specified for revegetation?	100	0	0

Table ES2. Summary of condition of wetland mitigation sites based on UCLA-CRAM scores. Data are percent of the 79 mitigation sites falling in each category. Optimal was >79.2% of possible points, suboptimal was <79.2% but >54.2% of possible points, and marginal to poor was <54.2%.

	Optimal	Suboptimal	Marginal to Poor
Overall	**4%**	**67%**	**29%**
Landscape context	9%	48%	43%
Hydrology	9%	68%	23%
Abiotic structure	18%	45%	37%
Biotic structure	9%	52%	39%

Table ES3. Summary of condition of wetland mitigation sites based on Services Lost versus Gained Assessment scores.

	Successful	Partially Successful	Failure
Overall	**34%**	**20%**	**46%**
Flood storage	42%	19%	39%
Flood energy dissipation	53%	14%	33%
Biogeochemistry	42%	24%	34%
Sediment accumulation	49%	14%	37%
Wildlife habitat	41%	21%	38%
Aquatic habitat	49%	22%	29%

Table ES4. Mitigation success by permit file. Data shown are percentages out of a total number of 50 permit files. The evaluation for 401 conditions was out of 55 files due to the inclusion of the 5 permits which had in-lieu fees paid that could not be tracked to specific mitigation projects. Numbers in parentheses are the actual number of sites within each category. For the UCLA-CRAM functional evaluation, success means "optimal wetland condition," partial success means "suboptimal" condition, and failure means "marginal to poor" condition. See the text for a full description of the success categories.

Category	Success	Partial Success	Failure	Cannot be Determined
Acreage Requirement	46 (23)	Not a category	24 (12)	30 (15)
401 Conditions	60 (33)	29 (16)	0 (0)	11 (6)
Mitigation Plan Conditions	44 (22)	34 (17)	0 (0)	22 (11)
Functional Evaluation	2 (1)	60 (30)	38 (19)	0 (0)

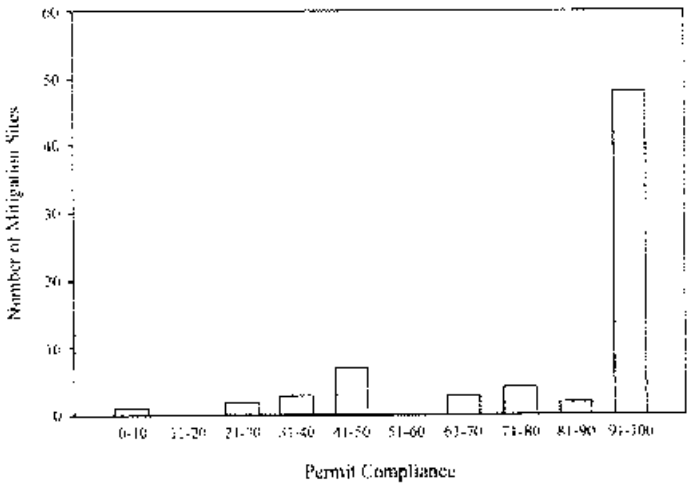

Figure ES1. 401 Permit Compliance histogram showing the percent of 401 Permit Conditions met for all of the files in the subset of fifty files evaluated fully and the five in-lieu fee files for which compliance could be determined (N= 70 mitigation sites within 49 files). Fifteen sites did not have assessable permit conditions, therefore compliance was not calculated for them.

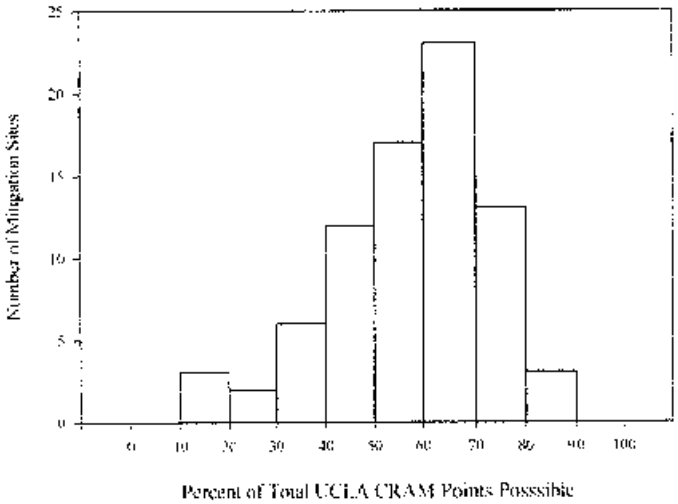

Figure ES2. UCLA-CRAM Totals – All Data. All data combined into a single functional success score for each of the 79 individual mitigation sites representing 50 files.

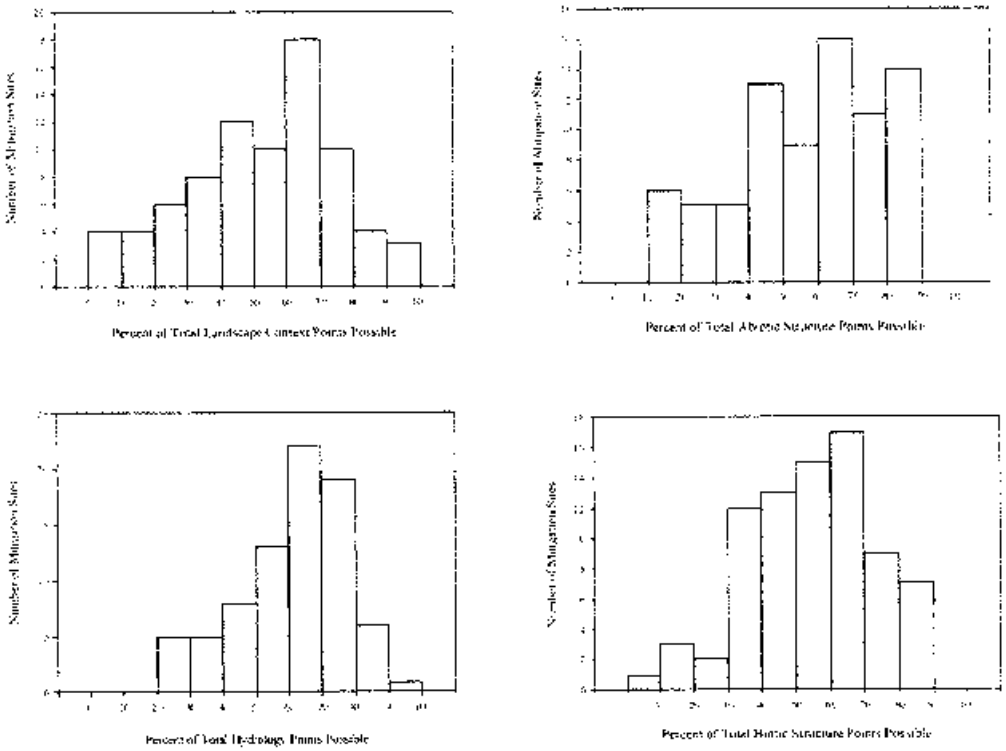

Figure ES3. UCLA CRAM Totals for four main functional categories. Landscape Context: All buffer extent, buffer width, buffer condition, and linear contiguity data combined into a single landscape context score. Hydrology: All water source, hydroperiod, and upland connection data combined into a single hydrology score. Abiotic Structure. All abiotic patch richness, topographic complexity, and sediment integrity data combined into a single abiotic structure score. Biotic Structure. All organic material accumulation, biotic patch richness, vertical structure, interspersion and zonation, and plant community integrity data combined into a single biotic structure score.

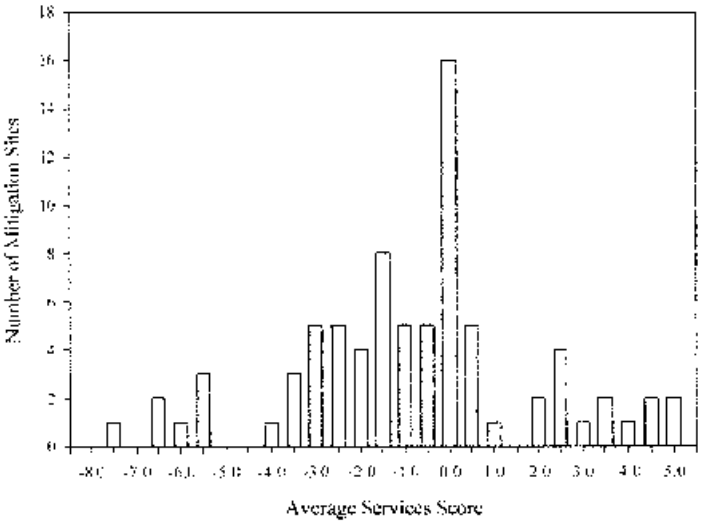

Figure ES4. Average Services Gained-Lost Scores across all services categories (Flood Storage, Flood Energy Dissipation, Biogeochemical, Sediment Accumulation, Wildlife Habitat, Aquatic Habitat) for all sites evaluated fully (N=79 mitigation sites within 50 files).

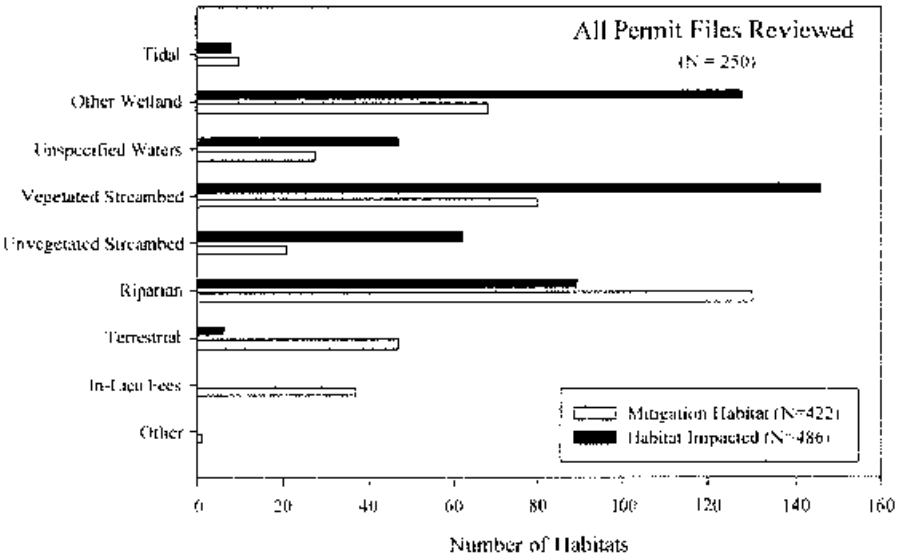

Figure ES5. Comparison of the habitat types lost at impact sites vs. habitats created, restored, enhanced, or preserved at mitigation sites for all 250 Permit Files reviewed in the initial phase of this project. Most permit files involve multiple habitat types at both impact and mitigation sites.

Interface Between Ecology and Land Development in California
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Buffer Zones for Ecological Reserves in California: Replacing Guesswork with Science

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Abstract. An integral part of any habitat conservation plan is the design and establishment of one or more ecological reserves to provide for the continued existence of threatened or endangered species. As a consequence of rapid urbanization, however, potential reserve areas in southern California often abut areas of intense human use. Although the extension of undesirable anthropogenic disturbance beyond urban boundaries into potential reserve habitat (sometimes referred to as "edge effects") can be identified, currently little scientific attention is being paid to reserve buffering. The importance of understanding boundary processes cannot be understated: areas near boundaries may be unsuitable for protected species, hence reducing the effective size of a reserve. Furthermore, this reduction disproportionately affects relatively smaller reserves (which have a higher perimeter/area ratio) that are characteristic of a fragmented landscape. We describe several approaches to quantifying edge effects at the urban/wildland interface; such research can obviate the use of guesswork in the design of buffer zones for nature reserves.

Keywords: Coastal sage scrub; core area model; *Dipodomys stephensi*; domestic cat; *Felis catus*; edge effect; habitat conservation plan; habitat fragmentation; reserve design; Riverside; SLOSS; Stephens' kangaroo rat.

Introduction

Ecologists and environmentalists are alarmed by the global rates of contemporary habitat destruction and biodiversity loss. This environmental degradation is primarily a consequence of continued exponential growth of the human population and the subsequent increased demand on space and natural resources (Western 1989; Ehrlich and Wilson 1991; Soule 1991a; Western 1992). Inescapable consequences of such population growth and habitat loss are increasing fragmentation and isolation of remaining natural habitat, and, ultimately, reduction of the natural world to a series of ecological reserves.

These reserves, whether their final boundaries are determined by design or by the residual of unregulated habitat loss, may vary in size from small habitat fragments in an urban landscape (e.g., Soule et al. 1988) to large national parks, national forests, and wilderness areas (e.g., Salwasser et al. 1987; Salwasser 1991). Although some reserves will be of ecosystem proportions, the size distribution of protected areas worldwide is heavily biased towards smaller reserves (Pellew 1991). Whether any reserve is of a sufficient size and appropriate configuration to viably support species populations or communities of special interest, however, has become a matter of considerable debate. Much attention has been focused on what has become known as the SLOSS (Single-Large-Or-Several-Small) question (Diamond 1975; Simberloff and Abele 1976; Diamond 1976; Soulé and Simberloff 1986; Simberloff 1988; Quinn and Harrison 1988).

In regions that are undergoing rapid urbanization, such as much of Southern California, the question of preplanning the establishment of reserves of sufficient size and configuration to maintain population or community viability is often moot, because of high land values and the extent of pre-existing habitat fragmentation. Instead, we often inherit a parcel of natural land abutting or embedded in an urban landscape. The boundaries of these parcels may be permeable to a variety of external forces that may be destabilizing to the specific attributes that we wish to preserve in the reserve. We contend that reserve establishment in urbanized California is a pointless exercise in crisis management if those reserves are going to be gradually eroded away by external forces. Boundary processes must therefore be of paramount importance from the outset of the conservation planning process.

The importance of understanding boundary processes cannot be understated because the effective size of an ecological reserve is almost always smaller than the area contained within the reserve's administrative boundary. Thus, the ultimate fate of any reserve depends on the magnitude of impacts from processes occurring at its boundaries (see Schonewald-Cox and Bayless 1986; Schonewald-Cox 1988; Schonewald-Cox et al. 1992). In his essay "The Eternal External Threat," Daniel Janzen (1986, p. 303) advises preserve managers: "Above all, be a field biologist who works with your preserve's neighbors to keep out what should be kept out." A reserve boundary that is unresistant to deleterious external influences is doomed to degradation by diffusion-like processes. Only the portion of the reserve that withstands degradation remains as the effective or core area reserve. The effective size or core area is a function of the cumulative magnitude of impacts resulting from penetration of the reserve boundary by external forces. Such "edge effects" have been studied in tropical forests (Janzen 1983, 1986; Lovejoy et al. 1986; Laurance 1990, 1991a, 1991b), temperate forests (Wilcove 1984; Temple 1986; Wilcove et al. 1986; Andren and Angelstam 1988), and in simulation models (Buechner 1987; Stamps et al. 1987). However, despite the significant role of urbanization in habitat fragmentation and biodiversity loss, there has yet been little research on edge effects in more urbanized situations (but see Soule et al. 1988; Bolger et al. 1991; Langen et al. 1991; Soule et al. 1992; Alberts et al. 1993; Sauvajot and Buechner 1993; Scott 1993). Although the appropriate size of a reserve is always relative to the specific conservation context, the impact of edge effects is particularly significant for small reserves because of their larger perimeter to area ratios (see below). Extensive habitat fragmentation, as we have in southern California today, precludes the luxury of establishing large reserves for many sensitive species. Therefore, reserve buffering must be adequately addressed in the reserve design phase of any habitat conservation planning process in this region.

We describe several approaches to quantifying edge effects at the urban/wildland interface in California. Our goal is to develop a methodology that is explicitly scientific. It involves the systematic collection of relevant data to ascertain whether edge effects do, indeed, exist, and to develop and test specific hypotheses about the underlying mechanisms that may be responsible for producing those effects.

Theory

We wish to develop an approach that emphasizes processes across the boundaries between reserves and adjacent land-use elements in a landscape mosaic (explicitly following Wiens et al. 1985). The boundary we are most concerned with is the "administrative boundary," the geographical limits to the authority of reserve managers (the legal boundary; see Schonewald-Cox 1988). The concern is how boundaries affect the exchanges or redistribution of materials, energy, and organisms between the reserve and adjacent parcels.

Dynamics across landscape boundaries are due to the action of "vectors," physical forces or animals that actively move material or energy in the system. Vectors are important because they may impose non-random, directional fluxes of materials. When evaluating the potential effects of animal vectors, it becomes necessary to understand individual behavior and movements, home ranges and space use patterns, foraging behavior, and diet.

The degree to which a boundary deflects the movements of vectors may be expressed as a boundary's "permeability," and it may be considered as the degree to which a reserve is "buffered" from a particular vector across that boundary. Permeability or buffering is a function of characteristics of both the boundary and the vectors taken together.

The likelihood that a boundary will be crossed by an animal vector is related to the density of animals outside (or within) a reserve. While the probability that an individual will encounter and perhaps cross a boundary is a function of its movement patterns and position with respect to the boundary, increases in population density produce a dramatic increase in the collective probability of boundary encounter. Thus, there is likely to be a clear density-dependence to cross-boundary movements.

We have already noted that small reserves have larger perimeter-to-area ratios than large reserves. This comparative quantity is not actually a ratio (which are dimensionless), but an index of the amount of perimeter per unit area. We prefer to call this index the 'relative edge' and express it in meters per hectare. A circular reserve will have the least amount of relative edge possible for reserves of equal area. Since the movement or diffusion of vectors across a boundary is directly related to the length of the boundary, in general reserves with high relative edge will have less buffering (more flux) than those with low.

The relationship between perimeter and area has been further refined in the development of the Core-Area Model by Laurance and Yensen (1991). In essence, they derive a shape index (SI) that describes the degree to which any given perimeter-area ratio (relative edge) departs from that of a circle of the same area. Combining the shape index with an edge function (d, the distance to which a disturbance vector penetrates a boundary, in meters) they derived an expression to calculate the core

area of any habitat fragment (in hectares). The authors point out that the only crucial assumption of the Core-Area Model is that d is unimodal.

Conservation in Urbanizing California

In southern California, urbanization of what was formerly wildlands is proceeding rapidly, resulting in extensive habitat fragmentation. Large-scale habitat fragmentation is almost automatically a precursor to conflicts between endangered species preservation and land development. There are a number of mechanisms for resolving such conflicts under the state and federal Endangered Species Acts. One of the most common routes to conflict resolution at this time is by application for a federal Incidental Take or 10(a) Permit through the development of a Habitat Conservation Plan (HCP) for the affected species. HCPs typically involve the establishment of ecological reserves ranging in size from a few hundred to thousands of hectares. The goal of the HCP process is to ensure the continued existence of a sensitive species while allowing some 'incidental take' by an otherwise lawful activity, such as land denaturation and development (cf. Soule 1991b), to continue (Bean et al. 1991; Beatley 1992). As a consequence of rapid urbanization, however, potential reserve areas in southern California are often adjacent to areas of intense human use. Although the extension of undesirable anthropogenic disturbance beyond urban boundaries into potential reserve habitat can be identified, currently little scientific attention is being paid to reserve buffering (in essence, the calculation of d_{min}).

The Buffer Design Process

Buffer design needs to be regarded as a key component of any integrated management strategy for sensitive species. The use of conservation easements and active management practices (habitat manipulation, alien predator control, provision of corridors for, or barriers to, wildlife movement, etc.) are other important components of an integrated management strategy, which can be implemented after potential impacts have been identified and quantified. Therefore, the first step in the buffer design process is the identification and, if possible, ranking of potential impacts.

The process should proceed as though a worst-case scenario exists; the reserve is isolated and suboptimal in size, and the sensitive species distribution is, at least initially, contiguous with the "impact boundary" at a completely permeable administrative boundary. This describes the situation where a housing development or an industrial park directly abuts an unfenced reserve boundary. Obviously, our concern is with the distance to which negative external influences extend into the reserve interior, and thus reduces the effective size of the reserve, and how we might change the permeability of that boundary to reduce vector movement.

The critical questions are:

1. What external forces or processes likely to have a negative impact on the protected species, community or resources in question are operating at the reserve boundary (i.e., what vectors are present)?

2. To what extent are those external forces likely to penetrate the boundary and result in negative impacts on the protected population(s) or community (i.e., how permeable is the boundary)?

3. Can these forces be ranked in terms of likely negative impact to produce a prioritized list of buffering requirements?

4. Are these potentially negative forces amenable to scientific hypothesis testing?

5. How do we collect data to evaluate hypotheses?

6. How do we mitigate for both general and specific impacts (i.e., how do we alter boundary permeability)?

We illustrate this process in a consideration of buffering requirements for the establishment of reserves for the endangered Stephens' kangaroo rat (*Dipodomys stephensi*) in the context of a long-term Habitat Conservation Plan that is being developed by Riverside County (RECON 1990, the short-term HCP). Roughly, that plan envisions three to seven independent reserves, each consisting of 500-2,000 ha.

One likely component of that HCP is the Motte Rimrock Reserve (a part of the University of California Natural Reserve System), a 515 ha ecological reserve located 30 km south of the city of Riverside (Fig. 1). Although, it is surrounded on all sides by major highways and dispersed urbanization, it contains a diverse flora and fauna including a number of sensitive species. Its irregular shape results in a relative edge of about 39 m/ha (perimeter = 20.125 km); since a a circular reserve of the same area would have a relative edge of 15.6 m/ha (Fig. 2), the Motte has an SI value of 2.5. If we run the

Laurance and Yensen Core-Area Model with SI = 2.5 and an arbitrary edge function of $d = 100$ m, we find that approximately 40% of the total area of the Motte would be lost to this hypothetical disturbance. Since no part of the reserve is more than 625 m from an edge, the Motte may not have any core area for certain external impacts, such as far-ranging domestic dogs.

We have hypothesized that the following forces have the potential to operate across reserve-urban interfaces in Riverside County to the detriment of Stephens' kangaroo rats:

1. Introduction of alien predators (particularly domestic cats).
2. Increased levels of nighttime illumination.
3. Increased sound and vibration levels.
4. Trespass (pedestrian, equestrian and off-road vehicle) and associated habitat alteration.
5. Introduction of competitors (commensal rats and mice).
6. Garbage disposal and pollution drift (e.g., pesticides etc.).
7. Disease transmission from domestic or commensal animals to wildlife.
8. Shooting (effects on community dynamics: e.g. mortality of natural predators, such as coyotes).

Our ranking of these forces as to their impact on Stephens' kangaroo rat populations is tentative, other

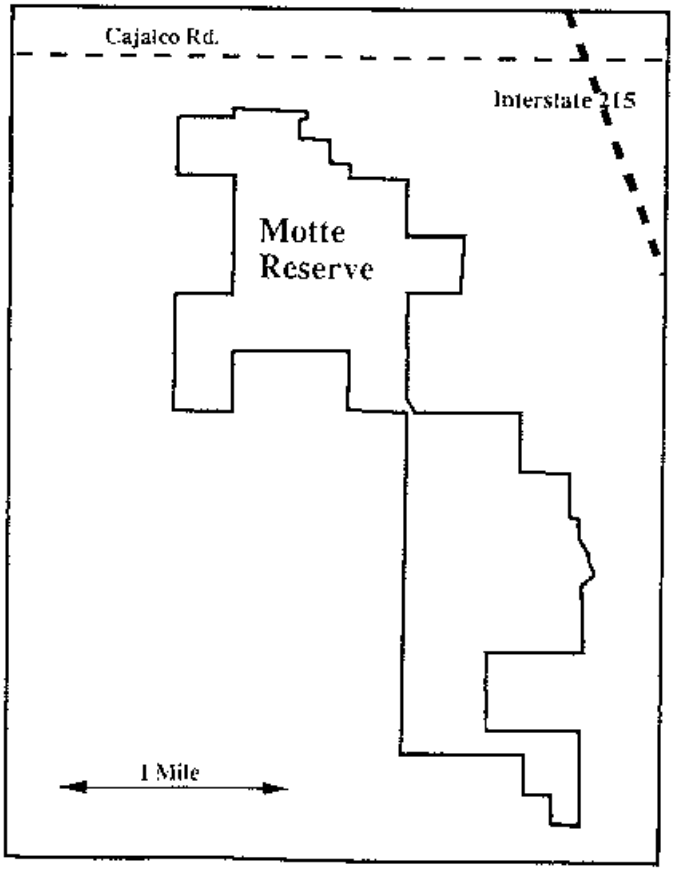

Figure 1. Map showing boundary of the Motte Rimrock Reserve. Adapted from Mayhew and Carlson (1990).

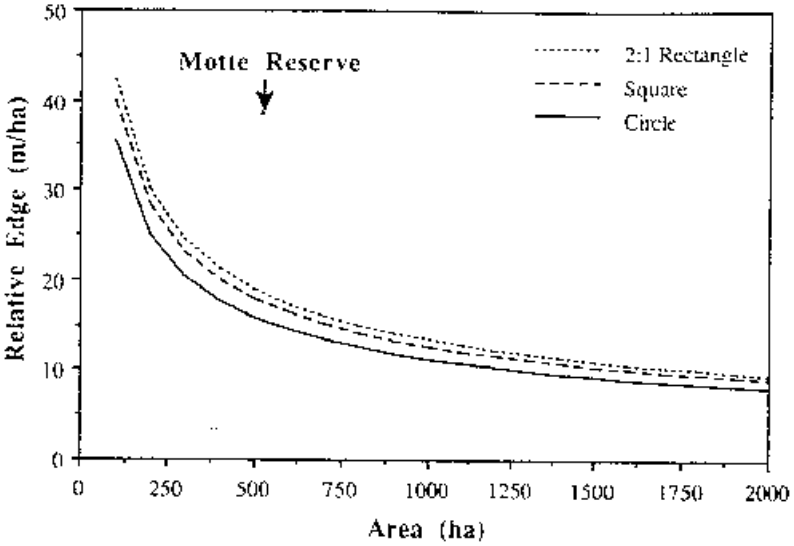

Figure 2. Perimeter/Area (relative edge) as a function of Area for three hypothetical reserve configurations: a circle, a square and a 2:1 rectangle. The relative edge for the Motte Reserve (arrow, ca. 39 m/ha) is at least twice the value for any of the three hypothetical reserve shapes for the same area.

than that we consider the impact of domestic cats (*Felis catus*) as likely to be highly significant. To study the penetration of these vectors into potential reserves, we suggest the use of two approaches:

Empirical non-specific approach

This involves documenting that, indeed, a statistically detectable edge effect exists and certainly represents the minimum degree of sampling and analysis that should be implemented for any reserve design. It should typically involve replicated censuses of target species (or communities) at set distances from hypothetical reserve boundaries under different impact situations. For example, we could calculate kangaroo rat burrow densities as a function of distance from a reserve boundary and contact with external forces. If linear or non-linear regression reveals a consistent relationship between population density and distance from the reserve boundary, an empirically-determined buffer zone (of width *d* meters) for the cumulative impacts can be proposed (Fig. 3). However, that buffer width will be only appropriate for the specific species and edge type under investigation.

Mechanistic hypothesis testing approach

To develop the most appropriate and effective buffer requires the identification of specific mechanisms likely to produce any pattern identified in the previous step. In essence, each of the forces we identified as potentially operating across boundaries to affect kangaroo rat populations serves as a hypothesis that can be tested. Although not always testable under a strict experimental regime, we can nonetheless collect data in such a way as to use strong inference about the influence of any particular mechanism.

As an example, we hypothesize that the predation of house-based domestic cats on kangaroo rat populations is a significant edge-related impact. To examine this hypothesis, we would attempt two approaches: predation documentation and cat movement studies.

House-based cats, unlike their feral cousins, are cooperative in that they often bring home prey items. The prey can be identified and the diet quantified through the help of cooperative pet owners. A variety of studies of this type have been performed throughout the world, most notably in Great Britain. In an English village, for example, domestic cats were responsible for at least 30% and perhaps 50% of the mortality of all sparrows in a one year period (Churcher and Lawton 1987, 1989). Considering the high levels of cat ownership in the U.S., their ability to survive as feral animals, and their innate hunting abilities, the potential of cats as a destabilizing force in ecological reserves is enormous. Studies on the diet of house-based and feral cats in southern California would indicate levels of predation pressure not only on kangaroo rats but also on a variety of other sensitive species (e.g., California gnatcatcher, *Polioptila californica*).

Determining the spatial distribution of feline predation in relation to reserve boundaries is obviously impor-

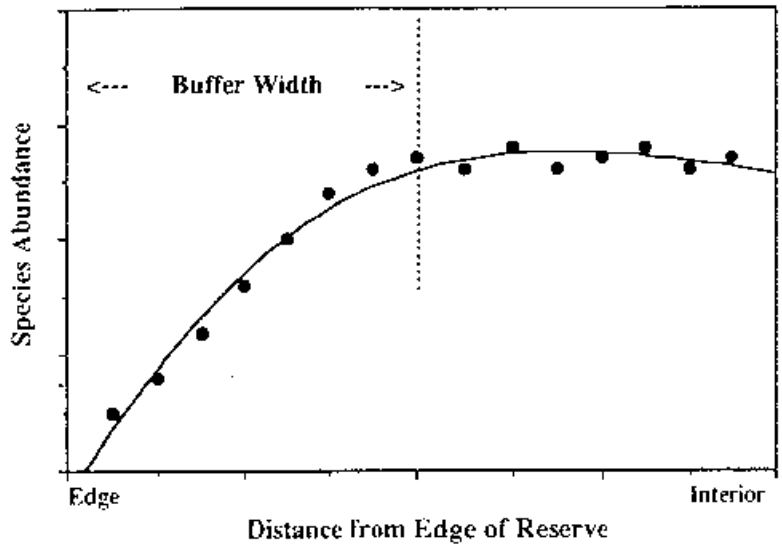

Figure 3. Empirical determination of buffer zone width (*d*) through censusing/sampling at set distances from the reserve boundary. If regression reveals a relationship between population density and distance from the edge of the reserve, a buffer zone of width *d* meters can be proposed for the cumulative impacts.

tant for buffer consideration. Observations in the field in Riverside County of domestic cats more than a mile from human dwellings (P. Kelly, personal observation) hint of the potential for feline impact deep within reserve boundaries. Movements of both house-based and feral cats can be studied using radio telemetry. The study should be designed to provide information on the degree of reserve penetration by gender, age-class and ownership status. Analysis of movement distributions should provide guidelines on buffering requirements for this particular edge effect.

Mitigation Recommendations

The result of non-specific and mechanistic approaches to buffering determination can provide a rationale for appropriate mitigation to counter edge effects. A number of mitigation avenues are available for use. For example, in a large reserve a sacrificial zone of open space equivalent to the buffer width identified in an empirical analysis might be incorporated within the boundaries of the initial reserve design; alternatively, such a zone could be imposed external to a proposed reserve boundary. If specific external impacts can be identified, inappropriate land use options can be limited within a specified distance of reserve boundaries (e.g., through conservation easements or restrictive covenants); if possible or appropriate, barriers can be constructed to block or curtail access by negative influences.

The external forces impinging on ecological reserves are identifiable in California's urbanized regions. However, an important point is that those same forces will impact different taxa in different ways. Appropriate buffering and management for one sensitive species will not necessarily apply to another sensitive taxon that may even use the same habitat. For example, studies on habitat fragments in San Diego indicated that native rodents were usually absent from smaller fragments whereas the bird fauna was not as affected (see Soule et al. 1988; Bolger et al. 1991; Langen et al. 1991; Soule 1991b; Soule et al. 1992). Soule and his colleagues also inferred that the presence of coyotes (*Canis latrans*) is a stabilizing influence, controlling the depredations of gray foxes (*Urocyon cinereoargenteus*), domestic cats, and other mesopredators. Studies in Arizona also indicate that coyotes seem to exert a stabilizing influence by controlling the depredations and movements of house-based cats (Goldsmith et al. 1991). For these reasons, the introduction of coyotes has been proposed to control the impacts on California least terns (*Sternus antillarum*) and light-footed clapper rails (*Rallus longirostris*) by urban populations of red foxes (*Vulpes fulva*), another alien predator (Zembal 1993). In the San Joaquin Valley, on the other hand, coyotes are a destabilizing influence in kit fox (*Vulpes macrotis*) recovery efforts (Scrivner et al. 1991).

Conclusions

A comprehensive scientific approach to the issue of reserve buffering in California is long overdue. As we move into an era of multi-species conservation planning, rigorous determination of buffering requirements for ecological reserves will become more difficult and more important. The development of a large-scale HCP is an extremely expensive undertaking: costs are about $25 million in the case of the Coachella Valley fringe-toed lizard (*Uma inornata*) and likely much higher for the Stephens' kangaroo rat HCP (see Beatley 1992). The tremendous costs involved demand that buffering be thoroughly addressed early in the reserve design process. The procedure we have described is very flexible and can be adapted to meet the specific needs of most reserve design situations in California.

To develop a buffering protocol we recommend:

1. Identification and ranking (if possible) of those external forces likely to impact the sensitive population(s) or community (communities) in question.

2. An empirical non-specific approach; censusing sensitive species at set distances from reserve boundaries, under varying impact conditions, to estimate the penetration and impact of negative external forces on the protected population(s).

3. Mechanistic hypothesis testing; study of the most significant forces (e.g. alien predators or competitors, trespass, runoff, light, noise, vibration, etc.) to quantify individual impacts.

4. Adoption of mitigation management practices that maximize buffering but minimize future costs. Public policies affecting conservation programs are subject to sudden change so it is important to minimize reliance on the future availability of funding for management.

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Predicting the impacts of urbanization on riparian bird communities

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Abstract

In 1995, birds were surveyed in riparian woodlands along a gradient of urbanization in the Santa Clara Valley, CA, USA, in order to determine the relationships between riparian bird communities and urbanization. Bird species richness and density decreased at a location as the number of bridges near that location increased and as the volume of native vegetation decreased. Species richness also increased as the distance to the nearest building and the width of the riparian habitat increased. Canonical correspondence analysis confirmed that bird community structure was influenced strongly by these variables. Many individual species responded significantly to variables associated with urbanization, most having lower densities on more urbanized sites. Whereas previous studies have demonstrated substantial effects of urbanization on bird communities in the habitats being directly altered, this study indicates that urbanization on lands adjacent to intact riparian woodlands has substantial impacts on riparian bird communities. © 1999 Published by Elsevier Science Ltd. All rights reserved.

Keywords: Urbanization; Birds; Riparian; Canonical correspondence analysis

1. Introduction

The influence of urbanization on bird communities has been examined in a number of studies (e.g. Emlen, 1974; DeGraaf and Wentworth, 1981; Beissinger and Osborne, 1982), most finding that urbanization has profound effects on bird species richness, abundance, and community composition. Low levels of development may increase bird species richness somewhat as additional resources, such as ornamental vegetation, artificial roosting or nesting sites, and anthropogenic food sources, are made available (Lancaster and Rees, 1979; Aldrich and Coffin, 1980; Blair, 1996). However, intense urbanization results in a depauperate bird community dominated by a few species that are common and widespread.

Relatively little attention has been paid to the impacts of urbanization on riparian bird communities. In Florida, Smith and Schaefer (1992) found bird species richness to be higher in riparian habitats in rural areas than in urban areas during summer and found that housing density on adjacent lands influenced riparian bird communities. Similarly, Cubbedge and Nilon (1993) reported variation in the densities of individual species among riparian habitats adjacent to different land use types in Minnesota. These studies indicate that urbanization has important impacts on riparian bird communities.

Urban impacts on riparian systems are worthy of further study for a number of reasons. First, they support very high numbers of plant and animal species (Knopf et al., 1988; Naiman et al., 1993). In arid regions in particular, riparian ecosystems are critical in maintaining high biodiversity on a regional scale (Johnson et al., 1977; Stevens et al., 1977; Knopf, 1985). Despite their importance to biodiversity, riparian systems have been severely degraded by anthropogenic activities. In California, for example, > 95% of the riparian vegetation that was present prior to European settlement of the state has been destroyed or significantly degraded (Smith, 1977; Katibah, 1984). In turn, this habitat degradation has caused substantial declines in the populations of many riparian-associated animal species (Gaines, 1974; Ohmart, 1994), necessitating protection of the remaining riparian habitat.

In arid regions, urbanization usually occurs along rivers at low elevations, where bird species richness and the number of regionally rare species are higher than in any other habitat type in a watershed (Knopf, 1985; Finch, 1989). In 1994–1995, a study of the effects of

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adjacent land use on riparian bird communities in the Santa Clara Valley of California showed that the proportion of native versus exotic vegetation, proximity to a building or bridge, and the amount of development around a riparian plot were closely associated with the distribution of riparian birds among 24 sites along a gradient of urbanization (Rottenborn, 1997). The objective of the present study was to determine the relationships between these urbanization-associated variables and bird species richness, density, and community structure on a much larger number of plots along a longer urbanization gradient in order to predict the effects of further urban sprawl and to conserve the bird communities in the Santa Clara Valley.

2. Methods

2.1. Plot selection and bird recording

The Santa Clara Valley is located between the Diablo and Santa Cruz Mountain Ranges at the southern end of the San Francisco Bay in California, USA. The northern and central portions of the valley are heavily urbanized; suburban areas surround this urban core, and agricultural/grassland areas are present in the southern part of the valley. Within this relatively broad, flat valley, study plots were selected along Coyote Creek, Los Gatos Creek, and the Guadalupe River, three of the largest streams in the study area. They are relatively narrow (mostly < 15 m wide), low-gradient, and slightly meandering, and are crossed by a number of bridges. The narrow (mostly < 80 m wide) corridors of mature woodland that remain along the banks represent some of the most valuable riparian habitat in the San Francisco Bay area (US Army Corps of Engineers, 1986).

Eighty-three plots were selected randomly along the lower reaches of these streams where the native riparian habitat tends to be dominated by Fremont cottonwood *Populus fremontii* and several species of willows *Salix lucidum*, *S. laevigata*, *S. lasiolepis*, and *S. exigua*. Fifteen of these plots, located in areas where the vegetation had been degraded considerably, were excluded from this study. The remaining 68 plots were located adjacent to a number of different land use types along a gradient of urbanization, ranging from heavy industry to agricultural land and open space in more rural areas. Each plot center was at least 75 m from the nearest bridge, and all plots were separated by at least 150 m. The center of each plot was located as close as possible to the center of the riparian corridor, usually at the stream edge.

Birds were surveyed five times on each plot from 23 May to 13 July 1995. The variable circular-plot method (Reynolds et al., 1980) was used to count the number of individuals of each species recorded within 70 m of each plot center for a period of 5 min. All surveys were conducted during the 4 h immediately following sunrise. Only birds within the riparian corridor were counted, and bird densities were determined from the dimensions of the corridor within each 70 m-radius plot. Most of the birds recorded on these surveys were thought to be breeding, or at least oversummering, in the riparian corridors of the study area. Noise from traffic or flowing water was not thought to have a significant effect on the detection of birds during these surveys.

2.2. Measurement of environmental variables

At each plot, a number of environmental variables were measured for use in multiple linear regression models predicting the densities of individual bird species. The diameters of all woody stems > 1 cm in diameter were measured within a radius of 35 m from the plot center (excluding areas outside the riparian corridor). The stem density of all woody plants (TOTSTDEN) and of native (NATSTDEN) and exotic (EXOSTDEN) species, as well as the proportion of stems that were native (NATPROST), were calculated. Because there were several bird species whose abundance might be related directly to the presence or abundance of live oaks *Quercus agrifolia* and *Q. wislizenii*, the density of oak stems (OAKSTDEN) was also calculated for each plot.

For the purposes of measuring habitat structure, five non-overlapping subplots 10 m in diameter were established on each plot, randomly positioned within 35 m of the plot center. Vegetation volume and foliage height diversity were measured at 10 stations along each of two transects in each subplot, laid out approximately parallel and perpendicular to the stream channel. Total vegetation volume (TOTALTVV) and the volume of native (NATIVTVV) and exotic vegetation (EXOTITVV) were measured using a 4.5 m pole following the methods of Mills et al. (1991). The number of stations having vegetation within 11 different vertical strata (0–0.5, 0.6–1.0, 1.1–2.5, 2.6–4.0, 4.1–6.5, 6.6–9.0, 9.1–12.0, 12.1–18.0, 18.1–24.0, 24.1–32.0, and > 32 m), determined using the pole or a range finder (Erdelen, 1984), was used to calculate foliage height diversity (FOLHTDIV; MacArthur and MacArthur, 1961).

Using the graduated pole (for low canopies) or a clinometer, canopy height (CANOPYHT) was measured at the upstream and downstream ends of the transect running parallel to the channel on each subplot, for a total of 10 measurements/plot. At these same 10 locations, a spherical densiometer was used to measure canopy cover (CANOPCOV) facing north, south, east, and west at each point for a total of 40 measurements/plot. All structural vegetation parameters were measured from June to early August.

The area of the portion of a 50 m radius circle around each plot center that fell within the riparian corridor (including the stream channel) was used as a surrogate for riparian corridor width (RIPWIDTH), as the irregular shape of the corridor on some plots precluded direct measurement of corridor width. Cats were counted during bird surveys, and cat density (CATDENS) was determined according to the variable circular-plot method.

Within a radius of 500 m of the plot center, the percent cover by pavement (PAVED500), buildings (BUILD500), and total artificial surface (ARTIF500) were estimated using aerial photos. In addition, the distance from the plot center to the nearest building (DISTBUIL), paved road (DISTPAVE), and bridge crossing the stream (DISTBRID) were measured and the number of bridges crossing the stream within 500 m of the plot center (BRIDG500), as measured along the center of the stream channel, was determined.

2.3. Data analysis

The total number of bird species observed on each plot during the study period was calculated. Because adjacent land use and urbanization may influence species belonging to different migratory status groups in different ways (Rottenborn, 1997), I distinguished permanent residents and summer residents recorded on each plot. For the purposes of this study, summer residents were defined as those species for which nearly all individuals winter south of the study area, mostly Neotropical migrants. Permanent residents were defined as those species for which a substantial proportion of the population is present in the study area year-round. The density of birds on each plot (in terms of the number of individuals recorded within the effective detection distance per 10 ha per census) was calculated by season for these two groups and for all species combined.

Stepwise multiple regression was used to relate patterns of variation in a subset of nine environmental variables to the observed patterns of species richness (after square root transformation) and density among plots, both overall and separately for permanent and summer residents, by finding the regression models containing the optimal combination of explanatory environmental variables. These nine environmental variables (Table 4), found to be closely associated with riparian bird community structure based on a previous study (Rottenborn, 1997), measured native and exotic vegetation characteristics, riparian corridor width, and the degree of urbanization surrounding the bird-survey plots. The stepwise forward selection method used in these regressions included only those variables which were significant in the model at $p < 0.01$.

A bootstrap technique was used to test the sensitivity of these regression models to variation in the plots used to construct the models. From the pool of 68 plots, I randomly selected plots one at a time, with replacement of each selection back into the pool of potential plots, until I had a "bootstrap dataset" consisting of 68 plots. I created 20 such bootstrap datasets and then used each one in a stepwise multiple regression, using the forward selection process to identify environmental variables significant to the model ($p < 0.05$). I then counted the number of bootstrap regression models in which each environmental variable was included as significant. If the variables selected as significant in the original model were selected repeatedly in the bootstrap models, then confidence in the results of the original regression model would be high. Conversely, if the variables selected in the bootstrap models were consistently different from those in the original model or showed no consistency, then the actual importance of the variables selected in the original model would be questionable. This bootstrap technique was carried out separately for each of the six stepwise multiple regressions involving species richness or total density.

Canonical correspondence analysis (CCA) was used to identify the environmental variables that were most strongly associated with the structure of the entire riparian bird community and to determine the locations of species along axes composed of this subset of nine environmental variables. For these ordinations, species data consisted of the density of each bird species recorded on at least four plots at each of the 68 plots. Correlations among environmental variables were also calculated. A Monte Carlo simulation with 99 permutations was used to test the significance of the overall ordination and each of the first two axes.

Although CCA gives some information on the habitat associations of individual bird species, its main goal is to find the environmental variables that best explain the structure of the overall bird community. Therefore, stepwise multiple regression was used to identify the environmental parameters most important in determining the distribution of individual bird species among the plots. In these regressions, the densities of each species recorded on at least four plots were regressed against the entire suite of 20 environmental variables that were measured, and forward selection was used to identify the variables that were significant in each regression ($p < 0.01$).

3. Results

Of 75 bird species recorded on the 68 plots (Table 1), 52 were considered permanent residents and 23 were summer residents. Species richness ranged from eight to 30 species/plot, and density ranged from 141.7 to 593.7 individuals/10 ha. Most species were rare or sparsely distributed in the study area; 31 species were recorded

Table 1
Bird species recorded on 70 m-radius riparian plots ($n = 68$ plots)

Species	No. of plots	Mean density[a]	Species	No. of plots	Mean density[a]
Anna's hummingbird *Calypte anna*[c]	68	25.18 ± 1.32	American kestrel *Falco sparverius*[c]	13	1.27 ± 0.36
American robin *Turdus migratorius*[c]	66	30.15 ± 1.60	Green heron *Butorides virescens*[c]	12	1.58 ± 0.47
Bushtit *Psaltriparus minimus*[c]	65	54.42 ± 2.82	Wilson's warbler *Wilsonia pusilla*[b]	11	1.51 ± 0.47
House finch *Carpodacus mexicanus*[c]	60	31.00 ± 2.21	Barn swallow *Hirundo rustica*[b]	10	0.91 ± 0.32
Song sparrow *Melospiza melodia*[c]	56	16.85 ± 1.27	American crow *Corvus brachyrhynchos*[c]	10	1.41 ± 0.43
California towhee *Pipilo crissalis*[c]	55	17.72 ± 1.37	Steller's jay *Cyanocitta stelleri*[c]	10	2.40 ± 0.75
Black-headed grosbeak *Pheucticus melanocephalus*[b]	54	23.99 ± 2.11	Brewer's blackbird *Euphagus cyanocephalus*[c]	9	4.09 ± 1.73
Northern mockingbird *Mimus polyglottos*[c]	52	8.04 ± 0.78	Western tanager *Piranga ludoviciana*[b]	9	0.70 ± 0.26
Bewick's wren *Thryomanes bewickii*[c]	51	13.72 ± 1.16	Red-winged blackbird *Agelaius phoeniceus*[c]	8	1.60 ± 0.53
Black phoebe *Sayornis nigricans*[c]	51	13.55 ± 1.31	Red-tailed hawk *Buteo jamaicensis*[c]	8	0.69 ± 0.25
Pacific-slope flycatcher *Empidonax difficilis*[b]	49	21.34 ± 2.12	Rock dove *Columba livia*[c]	7	3.01 ± 1.17
Western scrub-jay *Aphelocoma californica*[c]	48	10.49 ± 1.06	Turkey vulture *Cathartes aura*[c]	7	0.86 ± 0.34
European starling *Sturnus vulgaris*[c]	47	18.11 ± 1.77	Western wood-pewee *Contopus sordidulus*[b]	7	1.29 ± 0.51
Chestnut-backed chickadee *Poecile rufescens*[c]	41	12.86 ± 1.45	Dark-eyed junco *Junco hyemalis*[c]	6	1.16 ± 0.52
Mourning dove *Zenaida macroura*[c]	38	14.53 ± 1.98	California thrasher *Toxostoma redivivum*[c]	6	1.73 ± 0.70
Black-chinned hummingbird *Archilochus alexandri*[b]	37	15.96 ± 2.24	American goldfinch *Carduelis tristis*[c]	5	1.26 ± 0.56
Lesser goldfinch *Carduelis psaltria*[c]	36	9.39 ± 1.49	Violet-green swallow *Tachycineta thalassina*[b]	5	0.53 ± 0.26
Downy woodpecker *Picoides pubescens*[c]	36	8.23 ± 1.10	Hutton's vireo *Vireo huttoni*[c]	5	0.85 ± 0.39
Warbling vireo *Vireo gilvus*[b]	35	10.83 ± 1.50	Common yellowthroat *Geothlypis trichas*[c]	4	0.70 ± 0.37
Mallard *Anas platyrhynchos*[c]	30	8.45 ± 1.26	Willow flycatcher *Empidonax traillii*[b]	4	0.32 ± 0.16
Bullock's oriole *Icterus bullockii*[b]	29	4.31 ± 0.70	Western kingbird *Tyrannus verticalis*[b]	3	0.16 ± 0.10
Nuttall's woodpecker *Picoides nuttallii*[c]	27	6.08 ± 1.06	Acorn woodpecker *Melanerpes formicivorus*[c]	3	0.82 ± 0.47
Brown-headed cowbird *Molothrus ater*[c]	26	6.12 ± 1.10	Great egret *Ardea alba*[c]	3	0.28 ± 0.17
Oak titmouse *Baeolophus inornatus*[c]	26	8.14 ± 1.39	Black-crowned night-heron *Nycticorax nycticorax*[c]	3	0.27 ± 0.16
Yellow warbler *Dendroica petechia*[b]	26	6.62 ± 1.23	Pied-billed grebe *Podilymbus podiceps*[c]	3	0.24 ± 0.13
Spotted towhee *Pipilo maculatus*[c]	25	7.28 ± 1.26	Tree swallow *Tachycineta bicolor*[b]	2	0.08 ± 0.06
Belted kingfisher *Ceryle alcyon*[c]	24	3.24 ± 0.67	Hairy woodpecker *Picoides villosus*[c]	2	0.41 ± 0.33
Swainson's thrush *Catharus ustulatus*[b]	21	5.70 ± 0.84	Common merganser *Mergus merganser*[c]	2	0.25 ± 0.20
California quail *Callipepla californica*[c]	20	6.02 ± 1.19	Brown creeper *Certhia americana*[c]	2	0.57 ± 0.43
Cliff swallow *Petrochelidon pyrrhonota*[b]	18	3.74 ± 1.14	Olive-sided flycatcher *Contopus cooperi*[b]	2	0.17 ± 0.12
Allen's hummingbird *Selasphorus sasin*[b]	17	3.31 ± 0.85	Western bluebird *Sialia mexicana*[c]	1	0.07
N. rough-winged swallow *Stelgidopteryx serripennis*[b]	16	2.04 ± 0.68	Great horned owl *Bubo virginianus*[c]	1	0.17
Ash-throated flycatcher *Myiarchus cinerascens*[b]	16	3.27 ± 0.81	Western screech-owl *Otus kennicottii*[c]	1	0.09
Red-shouldered hawk *Buteo lineatus*[c]	15	1.50 ± 0.38	American coot *Fulica americana*[c]	1	0.56
White-breasted nuthatch *Sitta carolinensis*[c]	15	3.20 ± 0.77	Cooper's hawk *Accipiter cooperii*[c]	1	0.09
Hooded oriole *Icterus cucullatus*[b]	14	2.58 ± 0.70	American redstart *Setophaga ruticilla*[b]	1	0.19
Northern flicker *Colaptes auratus*[c]	14	3.13 ± 0.82	Yellow-breasted chat *Icteria virens*[b]	1	0.06
House sparrow *Passer domesticus*[c]	13	3.07 ± 0.85			

[a] Density = number of individuals/10 ha (± standard error).
[b] Indicates summer resident.
[c] Indicates permanent resident.

on fewer than 10 plots, and only 19 species were recorded on more than half of the 68 plots.

3.1. Species richness and density multiple regression models

The three regression models for species richness were highly significant, having three to four significant variables in each model and with r^2 values of 0.58–0.77 (Tables 2 and 3). Each of the three regression models for density had only two significant variables lower and r^2 values (0.25–0.34) than the models for species richness, but all were still highly significant.

Native vegetation volume (NATIVTVV), which was highly correlated (negatively) with exotic vegetation volume (EXOTITVV, Table 4), was included in all six models and was positively associated with species richness and density. The number of bridges within 500 m of a plot (BRIDG500) was the most important variable in all five of the models in which it appeared, explaining more of the variation in each model than any other variable. In the only model in which BRIDG500 did not appear, the distance to the nearest bridge (DISTBRID), which was highly correlated (negatively) with the number of bridges near a plot, was the most important variable. In all models, species richness and density decreased as the number of bridges near a plot or proximity of a plot to the nearest bridge increased. Total species richness and permanent resident species richness increased significantly as the distance to a

Table 2
Regression coefficients and y-intercepts for multiple regression equations of species richness (SR) and density (DENS) versus environmental variables[a]

	Intercept	BRIDG500	NATIVTVV	DISTBUIL	RIPWIDTH	DISTBRID	F[b]
Total SR	3.67	−0.20b	0.29b	0.01b	0.001a	–	51.5c
Permanent resident SR	3.61	−0.15b	0.18b	0.01b	–	–	29.8c
Summer resident SR	1.37	−0.19b	0.33a	–	0.001b	–	27.2c
Total DENS	226.35	−24.80b	56.66a	–	–	–	20.2c
Permanent resident DENS	148.64	–	32.20a	–	–	0.07a	11.4c
Summer resident DENS	33.31	−9.59a	23.51a	–	–	–	16.6c

[a] Letters following the regression coefficients indicate the significance of each variable in the overall regression equation (a, $p < 0.01$, b, $p < 0.001$, c, $p < 0.0001$).
[b] F-values are for tests of significance of the overall regression equations.

Table 3
Proportion of variance (r^2) explained by variables selected in multiple linear regressions of riparian bird species richness and density. Separate results for permanent residents, summer residents, and all species. The proportion of variance explained by the model containing all significant variables is given in the total section

	Species richness			Density		
	Permanent	Summer	Total	Permanent	Summer	Total
BRIDG500	0.41	0.35	0.49	–	0.21	0.25
NATIVTVV	0.05	0.08	0.14	0.08	0.13	0.13
DISTBUIL	0.12	–	0.09	–	–	–
RIPWIDTH	–	0.13	0.05	–	–	–
DISTBRID	–	–	–	0.18	–	–
Total	0.58	0.56	0.77	0.26	0.34	0.38

Table 4
Correlations among environmental variables used in multiple linear regressions of bird species richness and density and in canonical correspondence analyses

	NATS-TDEN	EXOS-TDEN	NATI-VTVV	EXOT-ITVV	ARTI-F500	DIST-BUIL	DIST-BRID	BRID-G500	RIPW-IDTH
NATSTDEN	1.00	−0.13	0.42	−0.35	−0.16	0.21	0.18	−0.14	0.13
EXOSTDEN	–	1.00	−0.24	0.34	0.13	−0.17	−0.01	0.13	−0.23
NATIVTVV	–	–	1.00	−0.63	−0.19	0.28	0.29	−0.26	0.29
EXOTITVV	–	–	–	1.00	−0.08	−0.15	−0.18	0.13	0.02
ARTIF500	–	–	–	–	1.00	−0.55	−0.15	0.33	−0.45
DISTBUIL	–	–	–	–	–	1.00	0.15	−0.28	0.19
DISTBRID	–	–	–	–	–	–	1.00	−0.57	0.17
BRIDG500	–	–	–	–	–	–	–	1.00	−0.31
RIPWIDTH	–	–	–	–	–	–	–	–	1.00

building (DISTBUIL) increased, while total species richness and summer resident species richness increased significantly with increasing riparian corridor width (RIPWIDTH).

The bootstrap regressions confirmed that the original regression models were not very sensitive to variations in the plots used to construct the models (Table 5). The variables found to be significant in the original models were selected as significant in 14–20 of the bootstrap models. In contrast, variables that were not included as significant in the original models appeared in no more than 10 of the bootstrap models. These results indicate that the variables found to be significant in the original models were indeed the variables most closely associated with species richness and density.

3.2. Canonical correspondence analysis

The results of the CCA of the riparian bird community appear in Fig. 1 as a biplot of the species scores

along the first two axes of the ordination. Although there was little overall variance in the species data, as noted by the relatively low eigenvalues for the first two axes (0.25 and 0.08), the ordination explained this variance fairly well. The first two axes explained 14 and 5% of the variance in the species data, respectively, and the vectors for the environmental variables and the species scores together explained 49% of the variance in the species–environment relationships along the first axis and 17% of the variance on the second axis. The species-

Table 5
Results of the bootstrap regressions of species richness (SR) and density (DENS) vs environmental variables

	BRIDG500	NATIVTVV	DISTBUIL	RIPWIDTH	DISTBRID	Other[b]
Total SR	20[a]	20	18	16	–	6
Permanent resident SR	20	19	15	–	–	8
Summer resident SR	20	18	–	20	–	10
Total DENS	17	20	–	–	–	10
Permanent resident DENS	–	14	–	–	20	10
Summer resident DENS	16	19	–	–	–	8

[a] For each of the variables that were included as significant in one of the original regression models, this table gives the number of bootstrap equations (out of a total of 20) in which the variable appeared as significant ($p < 0.05$)

[b] Other indicates the maximum number of bootstrap equations in which a variable that was not included as significant in the original model was found to be significant.

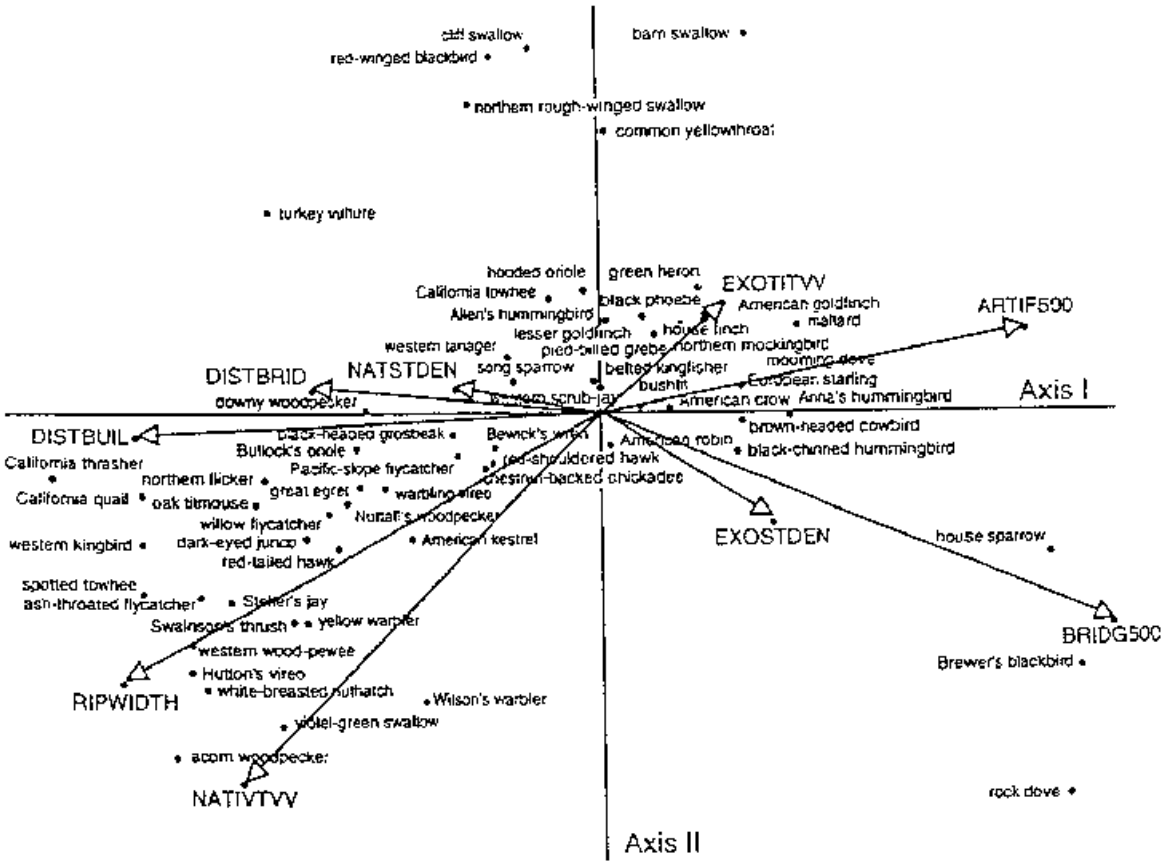

Fig. 1. Canonical correspondence analysis ordination diagram for the riparian bird community. Points correspond to the scores of individual species as a function of the axes, which are linear combinations of environmental variables. Arrows represent the environmental variables included in the model best representing the distribution of the species among the plots. The lengths of the arrows indicate the relative importance of each environmental variable in the model, and the direction of each arrow relative to the axes indicates how well the environmental variable is correlated with each axis. The location of each bird species relative to the arrows indicates the environmental conditions associated with the occurrence of each species.

environment correlations, indicating the ability of the environmental variables to explain the variation in bird community composition, were 0.87 for the first axis and 0.73 for the second. The overall ordination and the first and second axes were significant ($p = 0.01$).

Native vegetation volume (NATIVTVV), riparian corridor width (RIPWIDTH), distance to a building (DISTBUIL), number of bridges (BRIDG500), and percent cover by artificial surface around a plot (ARTIF500), the most important variables in the multiple regressions of species richness and density, were again the variables most strongly associated with bird community structure (Fig. 1). The first axis of the ordination was influenced primarily by number of bridges (BRIDG500) and artificial surface cover (ARTIF500) in one direction and by native vegetation volume (NATIVTVV), riparian corridor width (RIPWIDTH), distance to a building (DISTBUIL), and distance to a bridge (DISTBRID) in the opposite direction. This axis seems to separate the plots in narrow riparian corridors and in the most heavily urbanized areas from plots in less urbanized areas and/or in broader riparian corridors. Most of the species on the positive end of this axis are urban-adapted species, while many of those on the negative end are sensitive to human disturbance or require specific habitat features that are not present in highly urbanized areas.

Axis II was affected most strongly by native vegetation volume. Many of the species on the positive end of axis II, which is negatively correlated with native vegetation volume, are species generally associated with early-seral habitats. With the exception of rock dove, house sparrow, and Brewer's blackbird, the species on the negative end of axis II are generally associated with structurally complex habitats.

3.3. Multiple linear regression models for individual bird species

Of the 61 bird species that were recorded on at least four plots, significant regression models ($p < 0.01$) were constructed for 48 species (Table 6); the r^2 values for these significant models ranged from 0.08 to 0.64. In contrast, the densities of 13 species were not significantly related to any of the environmental variables ($p > 0.01$). Of the 21 environmental variables used in these analyses, 17 were included in models for at least one species. The variables that were significant in the most models, and which therefore seemed to be important to the most species, were the number of bridges within 500 m (BRIDG500), riparian corridor width (RIPWIDTH), total vegetation volume (TOTALTVV), and distance to the nearest bridge (DISTBRID).

Based on the results of the CCA and these regressions, the species whose populations are likely to decline as a result of increasing urbanization in the study area ("sensitive" species) and those whose populations are likely to remain stable or increase as a result of urbanization barring extensive habitat destruction ("tolerant" species) were identified (Table 7).

4. Discussion

4.1. Patterns of association between birds and urbanization

Changes in riparian bird communities resulting from urbanization may be caused by a number of factors. The most extreme impacts on riparian bird communities, which result from the outright destruction of riparian vegetation, are due primarily to the loss of structural resources (Rottenborn, 1997). However, where riparian woodlands remain intact, other urbanization-related factors may influence these bird communities. This study differs from most previous studies of the effects of urbanization on birds in one major respect: whereas most studies have examined the direct effects of habitat alteration, this study focused on the ways in which intact remnants of riparian habitat have been affected by urbanization on adjacent lands.

Variation in avian species richness, density, and community structure was closely related to environmental variables associated with urbanization. Plots closer to developed areas generally had lower species richness than those farther from development, and the densities of a number of species increased as proximity to roads and buildings decreased. The percent cover by buildings or by all artificial surfaces within 500 m of a plot was associated with the densities of some species but was not as important as the distance to the nearest building or road. Although some urban-adapted species, such as mourning dove and northern mockingbird, were positively associated with the percent cover by artificial surface around these plots, most species were negatively related to these variables. These results are similar to those of Friesen et al. (1995), who found that the density of housing around forest patches in Ontario was strongly associated with the species richness and abundance of Neotropical migrants nesting in the woodlots, indicating that urbanization can have substantial impacts on habitat remnants that are not directly altered.

Along streams in the Santa Clara Valley, cat density tends to be higher adjacent to residential and industrial areas than adjacent to undeveloped agricultural areas (Rottenborn, 1997). The number of people intruding into riparian corridors is probably also higher where setbacks between riparian habitats and developed areas are narrow and where housing density is higher on adjacent lands. Birds using riparian corridors very close to roads and buildings may be affected by noise and

Table 6
Significant ($p < 0.01$) positive (+) and negative (−) relationships between habitat/land use variables and bird densities

	CANOPCOV	CANOPHT	FOLHTDIV	TOTALTVV	NATIVTVV	NATSTDEN	NATPROST	EXOSTDEN	OAKSTDEN	DISTPAVE	DISTBUIL	DISTBRID	BUILD500	PAVED500	ARTIF500	BRIDG500	RIPWIDTH	r^2
Great egret												+						0.263
Green heron						+												0.121
Black-crowned night-heron																		ns[a]
Turkey vulture												+						0.094
Mallard						+							−					0.203
Red-shouldered hawk		+										+						0.210
Red-tailed hawk											+							0.128
American kestrel												+						0.093
California quail				+									−				+	0.557
Rock dove											−					+		0.365
Mourning dove						+												0.081
Black-chinned hummingbird							−						+					0.172
Anna's hummingbird											−							0.094
Allen's hummingbird																		ns
Belted kingfisher																		ns
Acorn woodpecker																		ns
Nuttall's woodpecker				+												−		0.320
Downy woodpecker											+					−		0.143
Northern flicker		+													−			0.238
Western wood-pewee		+							+	+								0.231
Willow flycatcher																		ns
Pacific-slope flycatcher	+			+												−		0.322
Black phoebe					−							−						0.102
Ash-throated flycatcher								−			+						+	0.346
Western kingbird		−				−							−				+	0.577
Hutton's vireo									+				−					0.340
Warbling vireo	+									+						−		0.246
Steller's jay		+						+									−	0.228
Western scrub-jay																		ns
American crow																		ns
Swainson's thrush					+					+								0.307
American robin	+															−		0.239
Violet-green swallow																	+	0.139
N. rough-winged swallow			−												−			0.484
Cliff swallow		−		−														0.321
Barn swallow			−	−														0.575
Chestnut-backed chickadee					+													0.148
Oak titmouse									+						−		+	0.521
Bushtit					+											−		0.228
White-breasted nuthatch	+								+		+						+	0.610
Bewick's wren				+						+								0.359
California thrasher		−		+													+	0.305
Northern mockingbird													+					0.128
European starling																		ns
Yellow warbler					−			−	−				−				+	0.582
Common yellowthroat																		ns
Western tanager																		ns
Spotted towhee				+					+						−	−	+	0.640
California towhee																−		0.194
Song sparrow							+									−		0.354
Dark-eyed junco								+			+							0.263
Black-headed grosbeak	+															−		0.392
Red-winged blackbird	−											+						0.468
Brewer's blackbird																+		0.267

(Table continued on next page)

Table 6–*contd.*

	CANOPCOV	CANOPYHT	FOLHTDIV	TOTALTVV	NATIVTVV	NATSTDEN	NATPROST	EXOSTDEN	OAKSTDEN	DISTPAVE	DISTBUIL	DISTBRID	BLILDS00	PAVEDS00	ARTIFS00	BRIDGS00	RIPWIDTH	r^2
Brown-headed cowbird																		ns
Hooded oriole																		ns
Bullock's oriole			+				+										–	0.212
House finch																		ns
Lesser goldfinch								–				+						0.127
American goldfinch												+						0.081
House sparrow							–										+	0.326

[1] ns, multiple regression model contains no significant variables.

movements of people and domestic animals on adjacent lands (Reijnen et al., 1995, 1996), influences that would not be as great in riparian corridors far from developed areas. Although this study does not identify a minimum buffer width required for the maintenance of the integrity of riparian bird communities, these results indicate that broader buffers better maintain riparian bird species richness.

Bird species richness and density were negatively related to the abundance and proximity of bridges. This relationship may be a direct result of disturbance from traffic, noise, or human ingress, or a result of barriers to free movement across gaps between sections of riparian habitat (Lens and Dhondt, 1994; Machtans et al., 1996). Alternatively, the abundance of bridges may be simply a proxy variable for the overall degree of urbanization around a plot, therefore representing a number of different factors acting in concert to influence riparian bird communities. Bridge locations did not seem to be influenced significantly by topography or other natural features that might impact these riparian bird communities.

Of the species that were negatively associated with the abundance or close proximity of bridges, sedentary species such as song sparrow and California towhee might be affected by the fragmentation of riparian corridors by bridges, and species such as great egret, American kestrel, black-headed grosbeak, warbling vireo, and Pacific-slope flycatcher may be averse to the noise and disturbance associated with bridges. Three species were positively associated with bridge abundance: rock dove and house sparrow are exotic species that nest under bridges, while Brewer's blackbird is an abundant urban-adapted species in the study area.

The positive relationship of bird species richness and density with native vegetation is to be expected since exotic vegetation is often deficient in structural and dietary resources required by many native animal

Table 7
Predicted sensitivity of bird species to urbanization in the Santa Clara Valley

Tolerant species[a]	
Mallard	American crow
Red-shouldered hawk	Bushtit
Rock dove	American robin
Mourning dove	Northern mockingbird
Anna's hummingbird	European starling
Black-chinned hummingbird	California towhee
Allen's hummingbird	Dark-eyed junco
Belted kingfisher	Brewer's blackbird
Black phoebe	Brown-headed cowbird
Northern rough-winged swallow	Hooded oriole
Barn swallow	House finch
Cliff swallow	House sparrow
Western scrub-jay	
Sensitive species	
Pied-billed grebe	Chestnut-backed chickadee
Green heron	Oak titmouse
Black-crowned night-heron	White-breasted nuthatch
Great egret	Bewick's wren
Turkey vulture	Swainson's thrush
Red-tailed hawk	California thrasher
American kestrel	Warbling vireo
California quail	Hutton's vireo
Acorn woodpecker	Yellow warbler
Downy woodpecker	Common yellowthroat
Nuttall's woodpecker	Wilson's warbler
Northern flicker	Western tanager
Ash-throated flycatcher	Black-headed grosbeak
Western wood-pewee	Spotted towhee
Willow flycatcher	Song sparrow
Pacific-slope flycatcher	Red-winged blackbird
Western kingbird	Bullock's oriole
Violet-green swallow	Lesser goldfinch
Steller's jay	American goldfinch

[a] Abundance of "tolerant" species is expected to increase or remain stable in riparian habitats following urbanization, while abundance of "sensitive" species is expected to decline following urbanization.

species (Anderson et al., 1977; Mills et al., 1989). The abundance of exotic vegetation in riparian areas in the Santa Clara Valley is substantially higher in urban areas adjacent to residential and industrial lands than in rural areas adjacent to agricultural land (Rottenborn, 1997). Likewise, the width of the riparian corridor was significant in several regression models and in the CCA. While some species may actually have been attracted to larger expanses of habitat, broader corridors likely contained greater habitat heterogeneity and more later-successional tree species (at the edges of the corridors) than narrow ones, and broader strips of riparian woodland may have provided a greater buffer from human influences to birds nesting in the interior of the corridor.

Examination of the CCA and the significant relationships between environmental variables and the densities of individual bird species revealed several patterns. Neotropical migrants, such as Swainson's thrush, yellow warbler, western wood-pewee, Wilson's warbler, willow flycatcher, and warbling vireo, were positively related to broad riparian corridors and high native vegetation volume and negatively related to variables associated with intense development. Although a few Neotropical migrants that use exotic vegetation frequently (e.g. black-chinned hummingbird, Allen's hummingbird, and hooded oriole) were present in heavily urbanized areas, the majority of Neotropical migrants seemed to show an aversion to riparian habitat in developed areas, as has been reported elsewhere (Friesen et al., 1995).

Species that glean insects from foliage or bark showed a strong preference for less urbanized areas, possibly reflecting low insect densities on heavily urbanized plots having abundant exotic vegetation (Mills et al., 1989). In contrast, ground-foraging and seed-eating species showed no clear patterns of distribution relative to urbanization. Most cavity-nesting species displayed a clear negative association with more urbanized plots; this may be due to a shortage of older trees with cavities or to competition with European starlings, which were positively associated with urbanization. Most of the species that nest on or near the ground, including California thrasher, California quail, spotted towhee, and Bewick's wren, were also negatively related to urbanization, possibly due to predation by cats and other predators in urban areas.

4.2. Conservation of bird diversity in riparian habitats

In many areas, urbanization is likely to continue to spread in the next century (US Department of the Interior, 1994), subjecting riparian systems currently in rural or natural areas to detrimental impacts. The foregoing relationships allow one to predict how further urbanization could affect riparian bird communities in the future. Thus, the densities of most obligate riparian species, Neotropical migrants, foliage and bark-foraging insectivores, ground-nesting birds, native cavity-nesters, and oak-associated species are likely to decline with the encroachment of bridges, adjacent development, and other elements of built landscapes.

However, some of the detrimental effects of urbanization on riparian bird communities can be minimized with proper planning. The single most important step that can be taken to conserve riparian bird communities in the face of urbanization is to minimize development in and along floodplains by maintaining broad buffers of undeveloped land between developed areas and riparian habitats. Habitat restoration efforts, particularly those that broaden riparian corridors and link fragments of riparian habitat, would augment habitat area and enhance the value of existing habitat by further buffering riparian birds from human influences outside the corridor. Where development has occurred in close proximity to riparian habitats, efforts to minimize direct human disturbance of riparian plant and bird communities (e.g. by restricting access to riparian habitats) and replace exotic plants with native species would also benefit riparian bird communities.

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REF 4

From: Jonathan N. Baskin <jnbaskin@pacbell.net>
To: bottorffm@vcss.k12.ca.us <bottorffm@vcss.k12.ca.us>
Cc: trhaglund@sbcglobal.net <trhaglund@sbcglobal.net>
Date: Friday, February 28, 2003 3:03 PM
Subject: letter from Tom Haglund

Ron - Here is the letter you asked for and text and in rtf. I will look into the tour on the 12th. -Jonathan

My principal concerns with the Newhall Ranch project, as proposed in the Draft Additional Analysis, relate to impacts on the fauna and flora of Santa Clara River. The potential to negatively impact, and perhaps eliminate the unarmored threespine stickleback, UTS, (*Gasterosteus aculeatus williamsoni,* a Federal Endangered Species) is particularly troubling.

The sensitive biota of the river, including the UTS, arroyo toad, least Bell's vireo *etc.* requires a habitat that is produced by a meandering stream. Meandering streams have a variety of shallow slow flow habitats, as well as, areas of faster flow, and during flooding overbank habitat is formed. A well-developed riparian corridor is essential to the birds, but is also important to the fish because it provides a refugium during high flows and its ecotonal nature increases productivity of the aquatic habitat. The sensitive aquatic species require good water quality; water free of sediments and chemical pollutants. The project documents do not provide adequate evidence that these conditions will be maintained if the project is implemented.

The installation of buried and other bank stabilization will destroy the riparian vegetation upon which some species (birds, insects and others) depend. Revegetation at best takes many years to produce the mature plant community that supports these organisms, and recent studies show that revegetation efforts, even if they succeed in restoring some of the ecosystem structure fail to restore ecosystem functions. One reason for this failure is that the root systems of willows, mule fat and other vegetation hold the soil in place, and these root systems take many years, perhaps hundreds of years, to develop. Even when the above ground vegetation is flattened or removed by floods, the roots resprout rapidly. The proposed bank stabilization will destroy this root system for many miles of riverbank area. Revegetation cannot replace it, and the soil will be much more vulnerable to erosion. This will in turn destroy the remaining vegetation and what ever has developed, and greatly increase sediment in the river. This sediment is particularly harmful to gravel spawning fishes such as the Santa Ana sucker, and the southern steelhead, which inhabits the river further downstream, and to the bottom nesting UTS. Sediment smothers the eggs and nests of the UTS. Additional downstream impacts of sediment and other water quality parameters are inadequately addressed. Furthermore. revegetation even if successful will tend to become uniform if the dynamic nature of the river is impaired. The diversity of organisms associated with the riparian is maintained by the dynamic nature of the stream, which periodically disrupts patches of riparian habitat so that the corridor is a mosaic of habitats in various stages of

ecological succession. Disruption of the disturbance regime will significantly reduce the biodiversity, including sensitive species such as the least Bell's vireo.

Also the narrowing of the river's flood plain, which restricts the meandering of the stream, will greatly increase the chances of the organisms being washed out in a flood, and will reduce the amount of habitat for riparian species. This will especially impact the UTS because this species utilizes the slow flowing edgewater, especially for nesting and rearing of young. Additionally, these "rough" edges of stream channels with streamside vegetation and other flow obstructions are particularly important areas because they provide places of refuge during high flows and floods. With the bank stabilization as proposed, this refuge will be eliminated in large parts of the river, so a flood event will more significantly affect UTS populations and many other species in these areas.

Maintaining adequate water quality is another important issue that is not adequately addressed. For example, clearly project residents will fertilize their lawns. These nutrients, such as nitrates and phosphates will unavoidably enter the river water. Here they will promote eutrophication and alga growth that will permanently alter the ecological conditions of large parts of the river, making these areas less suitable for native species such as the UTS.

It is stated in the Draft Additional Analysis that the river flows will be increased. However, it must be noted that greater flows are not always good for the organisms. One reason is that any environmental variable, such as flow, which exceeds normal tolerances of a species, either highs or lows, can eliminate that species. Higher than normal flow at the wrong time of year, such as the breeding season of the UTS, can eliminate the UTS breeding habitat and the nests and young of that breeding season. If this happens often the species can be eliminated. Annual species such as the stickleback are particularly vulnerable. Another way that increased flows can harm the UTS is because the fish is a distinct subspecies that is separated from another stickleback subspecies downstream in Ventura County (Fillmore) by a dry reach of river. This forms a barrier that prevents the upstream migration of Fillmore sticklebacks, which could interbreed with the UTS and eliminate it as a distinct subspecies.

The impacts described above could have a very significant impact on the river biodiversity, yet the project proponents repeatedly make the bold and self-serving statement that project impacts will be "insignificant" without giving any criteria for significance. Clearly, each project impact will impact each species and each habitat differently, so the level of significance will have to be clearly stated for each case if any credibility is to be given to these conclusions. This is simply not done. Also, on page 2.3-87 it is stated "The proposed Specific Plan would cause an increase in flows, water velocities, water depth; changes in sediment transport; changes in the flooded areas....the populations of species within and adjacent to the river corridor would not be significantly affected." Also, on the same page it is stated "....no significant impacts to the biological resources are anticipated due to the bank stabilization, bridges, or changes in the flood plain." The project proponents provide no credible support for these self-serving statements of insignificance. This project should be rejected until a full and credible analysis of impacts to biological resources is presented. Such broad, far-reaching ecological alteration cannot be considered

03/01/2003

insignificant without substantial high quality science to support this contention, and clearly delineated levels of significance explicitly stated. Appropriate studies and analyses need to be performed in order to demonstrate "insignificance", and if the project impacts are significant, then the project must be redesigned to reduce those impacts, and mitigate for any impacts that remain.

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03/01/2003

D12. Letter from Friends of the Santa Clara River, dated January 21, 2007

Response 1

See **Topical Response 2**: EIS/EIR Project.

Response 2

Impacts to species from stormwater can occur from pollutant runoff, from changes to hydrology, and changes to habitat. Best Management Practices (BMPs) are included as a part of the project design to treat runoff from the project site, and, therefore, urban runoff will not impact either habitat or sensitive species. The project's stormwater BMP designs will eliminate any surface nuisance runoff from entering the Santa Clara River. This will be accomplished by various methods, including capture of runoff, vegetative uptake, evapotranspiration using cottonwoods and other similar vegetation, and percolation.

No significant changes to hydrology will occur as part of the proposed project, as noted in the Draft EIR, Section 4.2. Table 4.1 in the Newhall Land-Landmark Village Flood Technical Report, August 2006 (see Draft EIR, Appendix 4.2), charts the discharge for the 2-year through Capital events in both the existing and proposed condition, and the table indicates that there is no significant change in discharge in the River between the two conditions. The Landmark Village project also will include detention facilities and energy dissipaters at storm drain outlets where necessary to prevent impacts to hydrology.

The majority of the bank protection is located at the fringe of the floodplain where areas will typically experience velocities lower than the main channel river velocities (typical is 2-8 fps along the banks at the Landmark bank protection v. >20 fps in the main channel at these locations during the 100-year discharge). The projected velocities at the bank stabilization location are generally non-erosive. The velocity distribution graphics (Figure 4.2A-G of the Flood Technical Report) for the 2- through 100-year flood events show these lower velocities in areas adjacent to the bank protection. In light of the above, the Draft EIR concluded that impacts to the unarmored threespine stickleback would not be significant. (Draft EIR, Section 4.5, pp. 4.5-64-4.5-65.)

Response 3

The Landmark Village Draft EIR, Section 4.5, Floodplain Modifications, p. 4.5-1, summarizes the project impacts as follows: "The hydraulic impacts on sensitive aquatic/riparian resources in the Santa Clara River corridor due to floodplain modifications associated with construction and operation of the proposed Landmark Village project site would be localized, and not cause significant hydrological impacts adjacent to or downstream from the Landmark Village site. On that basis, and given the limited amount of riparian habitat permanently altered by Landmark Village site development, project construction and operation would not significantly impact the unarmored threespine stickleback

(*Gasterosteus aculeatus williamsoni*), arroyo toad (Bufo californicus), California red-legged frog (*Rana aurora draytonii*), southwestern pond turtle (*Clemmys marmorata pallida*), or two-striped garter snake (*Thamnophis hammondii*)." From a cumulative, long-term perspective, the Draft EIR found:

> "In this case, cumulative impacts on the hydrology and hydraulics of the Santa Clara River associated with development of the entire Newhall Ranch Specific Plan were fully evaluated in Section 2.3 (Floodplain Modifications) of the Newhall Ranch Revised Additional Analysis (May 2003). Consequently, this Draft EIR incorporates by reference the floodplain modification analysis and conclusions from the certified Revised Additional Analysis (May 2003).
>
> That analysis concluded that the reduction in floodplain area caused by bank protection would not create a significant increase in overall velocities or water depth, because the volume of flow carried in these shallow, slow-moving areas along the margins of the river is small. Moreover, variations are localized and limited in scope, especially when viewed in the entirety of the river corridor within the Specific Plan site and downstream. Therefore, the overall mosaic of habitats in the river would be maintained because the key hydraulic characteristics would not be significantly different under the Specific Plan. Based on these results, . . . the proposed bank protection and bridges associated with the Specific Plan would not cause significant changes to key hydraulic characteristics, and, therefore, would not alter the amount and pattern of aquatic, wetland, and riparian habitats in the river at the Specific Plan site and downstream in Ventura County." (Draft EIR, Section 4.5, p. 4.5-72.)

Response 4

Most of the restoration areas, including those covering the buried soil cement, associated with Landmark Village are located outside of the existing riparian corridor and are presently being utilized for agricultural purposes. These restoration areas will be planted with native vegetation. It is unlikely that riparian mitigation in these areas would be impacted by storm events. Please see **Response 2**, above, and **Response 10**, below, which further support this finding.

To illustrate the point, **Figure D-1, Existing Buried Soil Cement Bank Protection along Santa Clara River at the Bridgeport Project**, shows an overview of existing buried bank protection along the Santa Clara River for the Bridgeport project site. The figure shows the buried bank protection planted with native vegetation. **Figure D-2, Buried Soil Cement at Bridgeport after 2004/2005 Storms**, and **Figure D-3, Aerial Photography of Still-Buried Soil Cement Bank Protection on San Francisquito Creek at Copper Hill Road Following the 2004/2005 Winter High Flow Events**, of this response present aerial views of the 2004/2005 storm flows on San Francisquito Creek near Copper Hill Road. The photos show that despite the 2004/2005 winter rainy season, which proved to be one of the wettest years on record and produced an approximate 50-year flood in the Santa Clara River, storm flows did not expose any of the buried soil cement bank protection and no damaged occurred to the revegetated areas at the Bridgeport project site.

Figure D-1, Existing Buried Soil Cement Bank Protection along Santa Clara River at the Bridgeport Project

Figure D-2, Buried Soil Cement at Bridgeport after 2004/2005 Storms

Figure D-3, Aerial Photography of Still-Buried Soil Cement Bank Protection on San Francisquito Creek at Copper Hill Road Following the 2004/2005 Winter High Flow Events

Response 5

The type of flood protection to be utilized within the Specific Plan was heavily debated and discussed during the processing of the Newhall Ranch Specific Plan (NRSP) from 1994 to 2003. The County, in approving the Newhall Ranch Specific Plan, required that the majority of flood protection proposed in conjunction with the Specific Plan be buried bank stabilization. Additionally, encroachment into the Federal Emergency Management Agency (FEMA) 100-year floodplain also was analyzed in the certified Newhall Ranch Specific Plan Program EIR and heavily debated and discussed during hearings on the Specific Plan. The Board of Supervisors, in approving the Newhall Ranch Specific Plan, permitted certain encroachments within the FEMA 100-year floodplain. The encroachments proposed in conjunction with Landmark Village are consistent with the Board's approval. Upon completion of land development activities, including the installation of buried bank stabilization, these areas will be elevated above the FEMA 100-year floodplain and, therefore, taken out of flood hazard.

It also should be noted that Landmark Village includes the installation of an alternative form of stabilization along the utility corridor west of the tract map site. This protection consists of turf

reinforcement mats (TRMs), and is characterized by a non-hardened surface. This form of stabilization works in this area due to lower velocities during the capital storm event.

Response 6

The comment asks whether multiple large projects in the upper Santa Clara River will cumulatively impact the biological resources of the River Corridor. Please see **Response 25**, below, for a detailed response to this inquiry.

Response 7

Balance Hydrologics assessed the potential effects of the planned cumulative urbanization within the Santa Clara River upstream of the County line (the upper watershed) on channel morphology by examining historical changes in the Santa Clara River channel pattern in response to different types of major disturbance using historical rainfall and other relevant records and aerial channel photography (Balance Hydrologics, 2005 (provided in Appendix F to Draft EIR, Appendix 4.3)). Additional study of the Santa Clara River was performed by Pacific Advanced Civil Engineering, Inc. (PACE), who prepared a comprehensive fluvial analysis of cumulative impacts on the Santa Clara River through the NRSP area for Los Angeles County Department of Public Works (LACDPW). A river fluvial analysis is the study of the river bed and bank sediment movement over time and as a result of flow in the river and changes in the tributary watershed. These findings are summarized in **Responses 5** and **9** to letter from California Regional Water Quality Control Board, Los Angeles Region, dated January 22, 2007; and **Responses 15** and **19** to letter from County of Ventura, Resource Management Agency, dated January 19, 2007.

Response 8

The comment states that Friends of the Santa Clara River (Friends) is submitting a separate comment letter on biota, prepared by David Magney Environmental Consulting. The comment letter from Mr. Magney was not attached to Friends' comment letter, dated January 21, 2007. However, the County did receive a comment letter from David Magney Environmental Consulting, dated January 30, 2007. Responses to that letter are provided in this Final EIR.

Response 9

The comment refers to an attached two-page e-mail from Jonathan N. Baskin, Ph.D., of San Marino Environmental Associates (San Marino). In that e-mail, which is dated February 28, 2003, Dr. Baskin refers to a letter from Dr. Tom Haglund, also with San Marino. Dr. Haglund's letter/memorandum, dated February 4, 2003, was submitted previously in connection with the Newhall Ranch Revised Additional

Analysis, Volume VIII (May 2003). Dr. Haglund's letter/memorandum, also consisting of two pages, is *identical* to Dr. Baskin's e-mail.[1]

Both the e-mail and letter/memorandum express concern that the Newhall Ranch project will "negatively affect, and perhaps eliminate the unarmored threespine stickleback." The e-mail and letter/memorandum also state that "sensitive biota of the river, including the [unarmored threespine stickleback], arroyo toad, least Bell's vireo, etc., requires a habitat that is produced by a meandering stream." In addition, the e-mail and letter/memorandum state that narrowing of the river's floodplain would restrict the meandering nature of the river and thus increase the chances of flood to washout the habitat for various aquatic/riparian species. There is also a general reference to the need to maintain adequate water quality, which, if reduced, make the river less suitable for native species such as the unarmored threespine stickleback.

These very same concerns were presented to, and rejected by, the trial court in the prior Newhall Ranch litigation.[2] Specifically, it was argued that the Newhall Ranch Revised Additional Analysis inadequately evaluated the biological effects of floodplain modifications, such as buried bank stabilization. The Superior Court carefully reviewed the floodplain modification analysis contained in the Newhall Ranch Revised Additional Analysis, Section 2.3, and was "satisfied the analysis adequately utilizes engineering and hydrologic modeling to determine the effect of project changes on endangered species and in the process reaches conclusions with documented biological, as well as engineering, input."[3] In addition, the Court reviewed both Dr. Haglund's letter/memorandum and the County's responses, and found that the responses were adequate under CEQA. As a result, these issues should not be re-argued here.[4]

In addition to the County's prior responses to the very same issues, Entrix, Inc. (Entrix) assessed the potential effects of the Landmark Village project, including bank stabilization, on threatened and/or endangered aquatic species.[5] The Entrix report focused on potential impacts to unarmored threespine stickleback, arroyo toad, and California red-legged frog, as these species are listed as threatened or endangered under the federal and state Endangered Species Act. In addition, the report included

---

1 Dr. Haglund's two-page memorandum is found in **Appendix A** of this Final EIR.

2 Please refer to the Superior Court's Ruling on Motion to Discharge Peremptory Writ, dated October 22, 2003, in the Newhall Ranch litigation, Case No. S-1500-CV-239324, RDR, which is found in **Appendix A** of this Final EIR.

3 Superior Court Ruling on Motion to Discharge Peremptory Writ, dated October 22, 2003, p. 2.

4 The County incorporates by this reference its prior responses to Dr. Haglund's letter/memorandum, which are found in the Newhall Ranch Additional Administrative Record, at Volume 76, pp. 73016-026. The prior responses are available upon request to Impact Sciences, Inc., 803 Camarillo Springs Road, Suite A-1, Camarillo, California 93012.

5 The Entrix report entitled, Focused Special-Status Aquatic Species Assessment - Santa Clara River (October 2006), is found in Appendix 4.5 of the Landmark Village Draft EIR.

discussion of potential impacts to southwestern pond turtle and two-striped garter snake, each designated by the State of California as "Species of Concern." The report also examined potential impacts to the habitat of the above species resulting from alterations to local hydrology and corresponding habitat areas through implementation of the Landmark Village project.

The report was based on a review of technical and regulatory documentation, as well as the findings gathered during numerous field reconnaissance surveys performed in 2004 and 2005 by qualified Entrix biologists, including Dr. Camm Swift. The report found no impacts to adjacent or downstream populations of the unarmored threespine stickleback resulting from the Landmark Village project. The findings specific to the unarmored threespine stickleback are as follows:

> "The potential impacts to unarmored threespine stickleback due to the construction and persistence of the Project's bank stabilization features and the bridge construction are expected to be less than significant. Stickleback are known to inhabit the Newhall Ranch reach of the Santa Clara River adjacent to the Landmark Village Project area. The location of the proposed stabilization features is set back beyond the existing riparian corridor in a majority of the Project and construction would not interface with the active stream channel. The hydrologic influence of the bank stabilization on fish is likely to be essentially transparent when viewed in conjunction with flood flow conditions. Based on reconnaissance surveys conducted following recent flood events (January and February 2005), high flow conditions appear to have dislocated and dispersed aquatic organisms downstream.
>
> The Flood Technical Report for the [Landmark] Village Project (PACE 2006) found that there would be no significant impacts in water flows, velocities, depth, sedimentation, or floodplain and channel conditions adjacent to and downstream of the Project site as a result of the proposed Project improvements. These hydraulic effects were also found to be insufficient to alter the amount, location and nature of aquatic and riparian habitats in the Project area and downstream into Ventura County. The technical analysis further determined that the river would still retain sufficient width to allow natural fluvial processes to continue; and, as a result, the mosaic of habitats in the river that support various sensitive species would be maintained, and the population of the species within and immediately adjacent to the river corridor would not be significantly affected. Based on that technical assessment, no impacts to adjacent or downstream populations of the unarmored threespine stickleback are expected.
>
> The Landmark Village Water Quality Technical Report (GeoSyntec 2006) indicates that modeled concentrations in runoff from developed areas with Project Design Features (PDFs) are below all benchmark water quality objectives and criteria and TMDL waste load allocations for the Santa Clara River and are addressed by a comprehensive site design, source control, and treatment control strategy. These water quality objectives are established to protect various beneficial uses including general wildlife, sensitive, rare and endangered species. Therefore, potential impacts from the Project on receiving water quality and beneficial uses in the Santa Clara River are not significant. Based upon

> that Report, no impacts to adjacent or downstream populations of unarmored threespine stickleback are expected." (Draft EIR, Appendix 4.5, Entrix Report, pp. 3-3-3-4.)

Similar findings were made for the arroyo toad, California red-legged frog, southwestern pond turtle, and two-striped garter snake. (Draft EIR, Appendix 4.5, Entrix Report, pp. 3-4-3-13.) The Landmark Village Draft EIR, Section 4.5, Floodplain Modifications, p. 4.5-1, also summarized the Entrix report findings.

Further, it should be noted that U.S. Fish and Wildlife Service (USFWS) protocol surveys were conducted by Bloom Biological, Inc. from April through July 2007. The survey area consisted of approximately 25 miles of the Santa Clara River and its major tributaries in and around Valencia, California. The tributaries included Lower Castaic Creek, San Francisquito Canyon, and the South Fork of the Santa Clara River. The survey area included the entire Santa Clara River from one-quarter mile downstream of the Las Brisas Crossing in Ventura County upstream to the future location of the Golden Valley Bridge (east of the Los Angeles Aqueduct). The survey area encompassed the stream margins and riparian habitat along portions of the river and tributaries that contained moving water. Daytime and nighttime surveys were conducted. No arroyo toad adults, juveniles, eggs, or larvae were detected on the property surveyed over the course of these surveys.[6]

Finally, as pointed out in the Newhall Ranch litigation, both the Baskin/Haglund e-mail and letter/memorandum are conclusory and lack factual support. Absent factual support for the Baskin/Haglund views, the County has made the factual determination to rely on the surveys and data generated by Entrix and Bloom Biological, Inc. in concluding that the Landmark Village project will not result in impacts to sensitive biota of the river, including the unarmored threespine stickleback, arroyo toad, and other aquatic and riparian special-status species. Also, the County has determined that installation of buried and other bank stabilization will not negatively impact the river or its water quality and, therefore, no significant impacts to sensitive species will result therefrom.

Response 10

The comment, quoting the Baskin/Haglund write-up, states that buried and other bank stabilization will destroy the riparian vegetation upon which some species depend. It also contends that revegetation will take several years to produce a mature plant community, will impact the ecostructure root systems, destroy the remaining vegetation, and greatly increase sediment to the Santa Clara River due to erosion. It further contends that sedimentation and water quality are inadequately addressed in the Draft EIR. Please see **Response 9**, above, with respect to impacts of bank stabilization to sensitive species.

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6 The Bloom Biological, Inc. summary of southwestern arroyo toad surveys, July 2007, is found in **Appendix A** of this Final EIR.

The Draft EIR, Section 4.5, pp. 4.5-49 and 4.5-62, summarizes the biological impacts as follows:

"**Biological Impacts of Hydraulic Changes**

An increase in velocities in the river could result in significant biological impacts if the increase caused (1) widespread and chronic scouring of the channel bed that removes a significant amount of aquatic, wetland, and riparian habitats from the river channel; and/or (2) substantial modification of the relative amounts of these different habitats in the river, essentially altering the nature and quality of the riverine environment; and/or (3) substantial effects to Rare, Endangered, Threatened or sensitive species.

(a) Impact on Flows

The hydraulic analysis above indicates that implementation of the project would increase clear flows, but decrease burned and bulked flows since project debris basins would capture upstream bulk flows and allow debris to settle out before entering into the river during a given return event. These hydraulic effects would be minor in magnitude and extent (<1 percent), and would not be sufficient to alter the amount, location, and nature of aquatic and riparian habitats in the project area and downstream. Therefore, no significant impacts would occur due to river flows.

(b) Impact on Velocities

The results of the hydraulic analysis indicate that the overall velocities in the river would not change during the frequent storm intervals (i.e., 2- and 5-year events) due to the floodplain modifications associated with the project. Overall, velocities for all return events are not significantly different between existing and proposed conditions at and downstream of the project site.

Based on these results, the floodplain modifications associated with the project (i.e., bank protection, bridge, and development in the River Corridor SMA/SEA 23 described above) would not cause significant scouring, and therefore, would not alter the amount and pattern of aquatic, wetland, and riparian habitats in the river at the project site. . . . Based on this information, no significant impacts would occur due to changes in river velocity.

(c) Impacts on Water Depths

An increase in water depth in the river could result in significant biological impacts if the additional water depth causes greater "shear forces" (i.e., friction caused by the weight of water) on the river bottom, and thereby increasing scouring of the channel bed and removal of vegetation. This effect could reduce the extent of aquatic, wetland, and riparian habitats in the river.

The results of the hydraulic analysis indicate that water depths in the river would not increase significantly due to project improvements. Water depths for all return events would not be significantly different between existing and proposed conditions (Figures 4.5-8a through 4.5-8f) at the project site and downstream. Hence, the project

> improvements would not cause significant scouring and therefore, would not alter the amount and pattern of aquatic, wetland, and riparian habitats in the river. Therefore, no significant impacts would occur due to changes in water depths in the river."

In addition, Pacific Advanced Civil Engineering, Inc. (PACE) prepared a technical memorandum evaluating buried bank stabilization installed in the Valencia area after the 2004/2005 winter storms. In that memorandum, PACE evaluated buried bank stabilization on the Santa Clara River and main tributaries, which had been installed by the project applicant since 1999. PACE first described the buried bank stabilization as follows: "Soil cement bank protection uses 89 to 94 percent native soil material excavated within the project area and introduces 6 to 11 percent cement. With a small amount of moisture, mixing and compaction of the processed soil material, a non-erodible bank protection is produced. In most cases, the soil cement is placed on a 1 to 1 or 1.5 to 1 slope face. This slope face is then "buried" or backfilled with native soils at a slope between 3 to 1 to 5 to 1. This soil backfill is then planted with native plant species. The native plantings and gradual slope of the soil in these areas will encourage river bank stabilization and resist most frequent river flow events."[7]

In terms of erosion, PACE concluded as follows: "[t]he majority of the river bank protection construction . . . includes a horizontal location of the bank protection that is located outside of or adjacent to the existing riparian edge. The placement of the bank protection outside of the existing river corridor substantially decreases the likelihood that the river scour will remove the buried soil [and] vegetation placed over the soil cement bank protection. As noted above, the majority of the bank protection is located outside of the existing riparian corridor where areas will typically experience velocities much less than the main channel creek velocities (typically velocities of 2-8 fps along the banks while velocities >15 fps in the main channel occur adjacent to these locations during the 100-year discharge). Lower, non-erosive, velocities in the areas along the buried bank stabilization indicate that it is unlikely that all or part of the buried bank stabilization will become exposed."

As stated, PACE evaluated the performance of buried bank stabilization after the 2004/2005 winter storms. The winter season "proved to be one of the wettest years on record and produced an approximate 50 year flood in the Santa Clara River at the [Los Angeles County]/Ventura County line. River flows at this location have been estimated by [Los Angeles] County at 49,800 cfs, the second highest on record." In evaluating the Bridgeport project, PACE noted that the buried bank stabilization was constructed in 1999 and had substantial revegetation growth, which was not damaged during the 2004/2005 winter storms. In addition, PACE evaluated several buried bank stabilization areas constructed along San Francisquito Creek for three projects. Although not yet revegetated, aerial photographs provided by PACE show the buried bank stabilization area on San Francisquito Creek and,

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7 The PACE technical memorandum, dated May 8, 2007, is found in **Appendix A** of this Final EIR.

despite the 2004/2005 winter high flows, none of the buried bank stabilization was exposed.[8] This illustrates the point that placement of buried bank stabilization outside of the existing River corridor substantially decreases the likelihood that the river scour will remove the buried soil and vegetation placed over the bank stabilization. Based on PACE's evaluation, the conditions noted in the comment (e.g., vulnerability to erosion, increased sediment, harm to sensitive species due to increased sediment, etc.) have not occurred in those areas where buried bank protection has been installed on the Santa Clara River and its main tributaries.

Response 11

Ambrose et al. (2006) evaluated compliance and wetland conditions of selected compensatory wetland mitigation projects permitted under Section 401 of the Clean Water Act by the California State Water Quality Control Board between 1991 and 2002. They evaluated 143 permit files from throughout California; 129 sites were visited to assess on-site compliance with permit conditions and 14 permit files were evaluated for compliance only. Ambrose et al., through application of the "California Rapid Assessment Method" (CRAM), found that mitigation sites taken together exhibit an increase in riparian vegetation and were moderately successful in meeting mitigation plan and wetland permit requirements and concluded that "permittees are, for the most part, meeting their mitigation obligations…." (p. iv) However, they also concluded that there was an overall loss of wetland function because the mitigation plans/permits did not adequately address functional values. Ambrose et al. concluded that mitigation requirements are not achieving the goal of Section 401 because wetland functions (landscape context, hydrology, abiotic structure, and biotic structure) and overall services (flood water storage, flood energy dissipation, biogeochemistry, sediment accumulation, wildlife habitat, and aquatic habitat) are not adequately addressed in the permit conditions. It is important to understand, however, that the Ambrose et al. report does not say that preserving functions and services is technically infeasible or impractical; rather, the permitting agencies, in coordination with permittees, must improve upon the setting of standard and special permit conditions that result in the preservation of wetland functions and services.

To ensure that wetland mitigation is adequate to offset impacts, the project applicant prepared a Conceptual Wetlands Mitigation Plan (Dudek 2007), with an overall goal of restoring and improving functions and values of the wetland system associated within the Landmark Village project.[9] This plan provides for the requirements outlined in Specific Plan EIR Mitigation Measures 4.6-1 through 4.6-16 and 4.6-42 through 4.6-47. Specific goals of the Plan are to:

- Comply with the requirements mandated in resource agency permits;

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8 See, PACE memorandum, dated May 8, 2007, pp. 1 and 3 [Figures 3 and 4].

9 The Conceptual Wetlands Mitigation Plan is found in **Appendix A** of this Final EIR.

- Create/replace upland and riparian vegetation communities suitable for nesting, foraging, and breeding by native animal species;
- Create/replace vegetation communities that are consistent with adjacent existing riparian vegetation communities;
- Create vegetation communities that are compatible with the fluvial morphology and hydrology of the stream channel corridor;
- Create vegetation communities with similar or higher functions and values than those vegetation communities permanently impacted by the project;
- Create vegetation communities that are self-sustaining and functional beyond the maintenance and monitoring period.

The mitigation plan is subject to approval by the CDFG, ACOE, and RWQCB. Mitigation requirements will be achieved through the creation, restoration, and enhancement of native vegetation communities on site and immediately off site in the existing Santa Clara River channel, including the provision of native vegetation communities and control of invasive exotics within the temporary impact area during a 5-year monitoring period. An additional 51 acres of wetlands will also be created on site. Wetland creation areas expand state and federal wetlands, and will be used to mitigate permanent impacts to native vegetation communities -- a significant problem identified by Ambrose et al. was that restored vegetation was often not under the jurisdiction of state or federal entities, which is not an issue here. Restoration areas re-establish native wetland vegetation communities following temporary project impacts. Enhancement areas are located within existing jurisdictional wetlands and involve enhancement of the functions and values of the existing vegetation community. In some cases, enhancement involves the removal of non-native species such as giant reed (*Arundo donax*) and the establishment of appropriate wetland species within the previous footprint of the removed non-native vegetation. One of the enhancement areas will convert an area of predominantly non-native vegetation to a predominately native wetland vegetation community, in this case, oak riparian forest. To ensure that pre-construction functions and values are documented, each affected riparian/wetland vegetation community will be characterized through compilation of a species list, vegetation transects, and photo documentation. Other baseline data that will be collected to facilitate mitigation design include on-site hydrology, the presence of invasive species on adjacent upstream lands, and channel morphology upstream of, and adjacent to, the proposed mitigation area.

As noted in Ambrose et al., wetland functions and services are broader than just vegetation communities. Abiotic resources are also important to overall function of a wetland system. Implementation of the above referenced mitigation plan will improve water quality, for example, by significantly reducing the amount of water-borne weed propagules (giant reed rhizomes, roots, and canes, herbaceous weed seed,

etc.) that currently flow downstream each winter. Deep-rooted native willow trees (*Salix* spp.), mulefat (*Baccharis salicifolia*), and Fremont cottonwoods (*Populus fremontii*) are not as susceptible to uprooting during high-flow events and will stabilize the soil better than the existing exotic species. Native riparian plants help to reduce turbidity and limit erosion during high-flow events. The native wetlands vegetation that replaces the non-native cover generally functions better at stabilizing soil and streambank edges and increasing nutrient transformation. The site hydrology is expected to improve by removing the water-consumptive exotic species, which will increase the amount of groundwater locally available to native trees, shrubs, and herbs. Water quality is also expected to be improved due to reduced water velocity, which will result from the wider floodplain, and more dense vegetation. Reduced water velocity may equate to greater sediment retention and deposition.

Finally, big sagebrush scrub will be planted on the wetland fringe and along the lower portion of the buried bank slope. California sagebrush scrub vegetation will be planted on the upper slope of the buried bank. These upland vegetation communities are well adapted to the conditions that are anticipated to occur along the perimeter of the project, and are intended to provide a positive buffer area for the wetlands mitigation areas and cover for wildlife during flood events. This buffer will increase the overall functions and values of the wetland mitigation area.

Response 12

The comment provides background information that will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not raise an environmental issue regarding the content of the Draft EIR, no further response is required.

Response 13

The comment refers to the Kelly and Rotenberry buffer paper (Kelly, P.A. and J.T. Rotenberry, 1993, "Buffer Zones for Ecological Reserves in California: Replacing Guesswork with Science," in *Interface Between Ecology and Land Development in California.* J. Keely (ed.), Southern California Academy of Sciences). The comment provides the following "key quote" from the buffer paper: "Buffer design needs to be regarded as a key component of any integrated management strategy for key species." Generally, the comment has over-simplified and generalized this report and its application to the Landmark Village project.

In fact, rather than relying on generic analyses, Kelley and Rotenberry recommend a scientifically-based buffer analysis to develop a "buffering protocol" for each particular reserve, including:

> "1. Identification and ranking (if possible) of those external forces likely to impact the sensitive population(s) or community (communities) in question. (underline added for emphasis).
>
> 2. An empirical non-specific approach: censusing sensitive species at set distances from reserve boundaries, under varying impact conditions, to estimate penetration and impact of negative external forces of the protected population(s).
>
> 3. Mechanistic hypothesis testing; study of the most significant forces (e.g., alien predators or competitors, trespass, runoff, light, noise, vibration, etc.) to quantify impacts.
>
> 4. Adoption of mitigation management practices that maximize buffering but minimize future costs. Public policies affecting conservation programs are subject to sudden change, so it is important to minimize reliance on the future availability of funding for management." (Kelly and Rotenberry 1993, p. 91)

The "buffering protocol" demonstrates that Kelly and Rotenberry's intent was to provide an objective method for identifying the appropriate buffers for a particular reserve relative to its species populations and vegetation community characteristics, The intent was not, as the comment asserts, to indicate that a reserve with a buffer less than 1 mile wide is inherently subject to adverse edge effects; adverse effects will be specific to the particular reserve and sensitive populations that occupy the reserve. Kelly and Rotenberry reported that cats travel up to 1 mile away from human dwellings into reserves in western Riverside County. However, the literature relevant to the potential penetration of domestic house cats into reserves is variable and probably reflects the specificity of each situation. Kays and DeWan (2004), for example, demonstrated that domestic cats rarely leave the residential yard area, have an average home range of 0.6 acre, and hunt, 80 percent of the time, within the yard or 35 feet therein. CBI (2000) hypothesized that the movement range of domestic cats is dependent on the health of the coyote population in the surrounding area and, that where coyotes are present, cats are likely to only have impacts within 100 to 200 feet of the urban-wildland edge. Cats that range farther than 100 to 200 feet from the urban edge are more likely to be killed by coyotes than those that stay close to the residential yard.

Habitat buffers along the Santa Clara River were analyzed in the Landmark Village Draft EIR, Section 4.4.9, pp. 4.4-60 through 4.4-61. This section cites the Impact Sciences (1997) study that conducted vegetation analyses, focused bird surveys (1,100 field hours), and small mammal trapping (1,200 trap nights) along the Santa Clara River and adjacent uplands.[10]

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[10] Please see **Appendix A** of this Final EIR for the "North Valencia Annexation Buffer Study, Draft," Impact Sciences, Inc., dated April 28, 1997 (Buffer Study).

The Buffer Study collected data for plant species composition, canopy height, shrub/tree density, percent cover and other species-specific criteria in order to define high-quality versus low-quality upland habitat for wildlife use and diversity. The focused wildlife studies concentrated on riparian bird and small mammal use of high- and low-quality upland habitat and upland/riparian ecotone and utilized systematic survey methods, including time-area observations, belt-transect counts at different distances parallel to the Santa Clara River, small mammal trapping, scent stations, and remote cameras. The Buffer Study thus helped identify the special-status populations at risk and their habitat use patterns along the River corridor. For example, at the western study site about 63 percent of riparian-dependent birds were observed in riparian habitat, 14 percent were in edge habitat, 18 percent were in upland habitat (primarily dense big sagebrush scrub and coastal sage scrub at this site) within 50 feet of the riparian edge, 5 percent were in upland habitat between 50 and 100 feet of the riparian edge, and 1 percent (one observation) were in upland habitat between 100 and 150 feet from the riparian edge. No riparian-dependent birds were observed beyond 150 feet from the riparian edge. Combined 94 percent of the riparian-dependent bird observations were within 50 feet of the riparian edge (including the riparian habitat) and 99 percent were within 100 feet. The Buffer Study also cited studies of least Bell's vireo in San Diego and Santa Barbara counties with findings that where the riparian corridor is relatively wide (>100 feet) vireos only foraged within 100 feet of the riparian edge and where the riparian corridor is more narrow (<100 feet) vireos ranged up to 300 feet from the riparian edge. The Buffer Study suggests that riparian buffers along the Santa Clara River should range from a minimum of 100 to 150 feet in width, depending on the quality of the upland habitat (a larger buffer width required if the upland habitat is of low quality). Thus, habitat enhancement in areas where the buffer is narrower could compensate for the smaller buffer. In addition, the Buffer Study recommended a wall at the edge of development to attenuate noise and lighting, and discourage human intrusion.

It also should be noted that a minimum 100 feet of high-quality upland habitat from the edge of riparian habitat is consistent with CDFG (Northern California-North Coast [Region 1]) buffer criteria for avoiding significant impacts to riparian species and habitats adjacent to urban development (CDFG 2001).[11] In developing the buffer criteria, CDFG stated that "[d]epartment biologists have relied on scientific research and literature and professional experience to develop the following recommendations to protect the public's fish, wildlife and native plant resources." For example, CDFG recommends a 75-foot buffer from the outside edge of the riparian habitat for the Sacramento River, a 50-foot buffer for main tributaries, and a 25-foot buffer for secondary tributaries. CDFG also stated that "[i]f development restrictions related to mandatory requirements do not allow a project to completely avoid the area of the buffer zone outside the riparian vegetation, the project proponent may average the setback distance along

[11] Please see **Appendix A** of this Final EIR for the CDFG (Northern California-North Coast, Region 1) buffer criteria.

the riparian habitat for the length of the project." Therefore, there is some flexibility in the minimum buffer width as long as the average width criteria are met.

Before addressing buffer issues for the Landmark Village project, it is important to understand that the buffer between the Santa Clara River and development was addressed and heavily debated during the Newhall Ranch Specific Plan environmental review and approval process. Prior to final Specific Plan approval, the County Board of Supervisors required that the Specific Plan design be revised to incorporate a 100-foot-wide setback (top of bank stabilization to residential, commercial, mixed use development) to protect riparian habitat and special-status species within the River Corridor SMA/SEA 23 boundaries. This setback is in addition to an average buffer width of 100 feet from the top of bank stabilization to existing riparian resources. This finding was arrived at after evaluating the potential impacts of the proposed land uses along the entire length of the River (consistent with the Kelly and Rotenberry recommendations), coupled with the existing habitat protection and enhancement provisions contained in the Specific Plan's Resource Management Plan and Design Guidelines. The overall buffer area is comprised of several components: (1) the Salt Creek wildlife corridor connection and the High Country half-mile-wide buffer at the westerly end of the Specific Plan on the south side of the River; (2) native upland habitats in the Open Area along the south side of the River; (3) disturbed areas in the River corridor that will be restored or enhanced as riparian habitat; (4) buried bank stabilization that will be revegetated with native riparian and upland plant species; and (5) landscaped open space areas such as community parks, the Regional River Trail, and community trails.

In approving the Specific Plan and Conditional Use Permit No. 94-087-(5), the Board of Supervisors found that the Specific Plan contained sufficient natural vegetative cover and open space to buffer critical resources in the River Corridor SMA/SEA 23 from the development shown in the Specific Plan. The Board of Supervisors further found that the Specific Plan incorporated extensive buffer area to protect critical resources within the Santa Clara River. The Specific Plan's adopted Resource Management Plan requires a minimum 100-foot-wide setback adjacent to the Santa Clara River between the top river-side of the bank stabilization and development within certain specified land use designations (including those of the Landmark Village project site) unless through Planning Director review, in consultation with the County staff biologist, it is determined that a lesser buffer would adequately protect the riparian resources within the River Corridor SMA/SEA 23, or that a 100-foot-wide setback is infeasible for physical infrastructure planning. Again, these buffer criteria are consistent with the Impact Sciences and CDFG recommendations described above.

This buffer analysis does not presume that indirect effects on sensitive biological resources in the river corridor will not potentially occur as a result of development. In combination with the 100-foot setback, the Specific Plan's Resource Management Plan provides standards by which biological resources will be

managed during construction and for the life of the community, including provisions for: (1) restoration and enhancement of disturbed areas; (2) restrictions on pedestrian and vehicular access to the river corridor; (3) design standards for transition areas between development and the river; (4) conveyance of conservation easements; and (5) preparation of a financial plan and the long-term management of the riparian resources by the Center for Natural Lands Management.

The Landmark Village project would maintain a 100-foot setback between the top of the bank and proposed residential, mixed-used, and commercial development. Based on the site-specific analysis conducted in the Draft EIR, the Landmark Village buffer is consistent with the approved Specific Plan. However, as noted above, designation of the 100-foot-wide setback does not imply no potential for indirect effects. Specific to the Landmark Village project, potential long-term indirect effects are analyzed in Section 4.4 of the Draft EIR, pp. 4.4-85 through 4.4-92, including increases in: (1) pesticides, herbicides, and pollutants; (2) lighting and glare impacts on wildlife species; (3) non-native plant and wildlife species; and (4) human activity and domestic pets. The Project Design Features (PDFs) and mitigation measures to reduce these potential indirect impacts are also discussed in the Draft EIR.

PDFs to address urban runoff from irrigation and stormwater include site design, source control, treatment control, and hydromodification control Best Management Practices (BMPs). Stormwater runoff from all urban areas within the Landmark Village project will be routed to bioretention areas, vegetated swales, and/or extended detention basin treatment controls BMPs. The effectiveness of these PDFs to maintain water quality in the Santa Clara River was analyzed by GeoSyntec Consultants.[12]

The mitigation measures to address the other listed potential indirect effects include previously incorporated measures from the Newhall Ranch Specific Plan Program EIR and additional measures recommended by this EIR. Significant impacts related to buffers and edge effects and mitigation measures to reduce the level of impact include:

- Restriction of Wildlife Habitat Linkages – mitigated by previously incorporated mitigation Measure SP 4.6-18.
- Increased Light and Glare – mitigated by previously incorporated Mitigation Measure SP 4.6-56.
- Increase in Populations of Non-native Plant and Wildlife Species – mitigated by the Landmark Village EIR Mitigation Measures LV 4.4-28 and LV 4.4-31.
- Increased Human and Domestic Animal Presence Within SMA/SEA 23 – mitigated by previously incorporated Mitigation Measures SP 4.6-17 through SP 4.6-19 and Landmark EIR Mitigation Measures LV 4.4-32 through LV 4.4-34.

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12 GeoSyntec Consultants. September 2006. *Landmark Village Water Quality Technical Report* (see Draft EIR, Appendix 4.3).

Response 14

With regard to urban edge impacts please see **Response 13**, above.

Response 15

With regard to urban edge impacts on riparian bird communities please see **Response 13**, above.

Response 16

The comment states that the Landmark Village buffer range from zero to approximately 300 feet and then fail to buffer riparian species. The Draft EIR, on p. 4.4-61, states that the proposed project maintains a 100-foot setback between top of bank and proposed residential, mixed-used, and commercial development. The vegetation within portions of the setback and buffer area will be restored and/or enhanced to increase habitat values when compared to existing conditions. Given the above, the proposed riparian setback and buffer are sufficient to maintain the function and values of the adjacent riparian habitat and to protect the diversity of riparian-associated wildlife species occurring within these areas. This finding is consistent with the findings of the Newhall Ranch Revised Additional Analysis (May 2003) that concluded the proposed land use plan and other design features were sufficient to maintain the function and values of the riparian habitat within the SMA/SEA 23.

Response 17

With regard to buffers and impacts to riparian resources please see **Responses 13** and **16**, above.

Response 18

Figure 4.1 in the Landmark Village Flood Technical Report (Draft EIR, Appendix 4.2) compares the floodplain acreage between the existing and proposed conditions for the 2-year through Capital storm events. The figure shows a change of -0.5, 0.5, 1.1, -33.9, -90.2, -100.6, and -169.1 acres of floodplain change for the 2-, 5-, 10-, 20-, 50-, and 100-year, and Capital discharges, respectively. The increases in floodplain acreage for the 5- and 10-year events are the result of returning agricultural land to riverine and upland habitat. It should be noted that the FEMA 100-year floodplain and the County's Capital floodplain are each based upon a modeled elevation and do not correspond with the edge of the riparian resources associated with the River. Agricultural areas account for the vast majority of the project site below the elevations for the 100-year and Capital storm events. In summary, these areas within the project site that are presently below the elevation of the 100-year and Capital floodplain are not natural habitat, but disturbed agricultural property. Finally, approximately 51 acres of land historically used for

agricultural purposes will be converted to riparian and upland habitat following the development of the Landmark Village project.

Response 19

The comment indicates that the Los Angeles RWQCB has recommended that the Newhall Ranch Specific Plan avoid development in the floodplain. The comment does not indicate the source of this information; therefore, it is difficult to respond. A comment letter, dated January 22, 2007, submitted by the RWQCB on the Landmark Village project EIR does not include this comment.

In addition, encroachment into the FEMA 100-year floodplain was analyzed in the previously certified Newhall Ranch Specific Plan Program EIR, and heavily debated and discussed during hearings on the Specific Plan. The Board of Supervisors, in approving the Newhall Ranch Specific Plan, permitted certain encroachments within the FEMA 100-year floodplain. The encroachments proposed in conjunction with Landmark Village are consistent with the Board's approval. Upon completion of land development activities, including the installation of buried bank stabilization, these areas will be elevated above the FEMA 100-year floodplain and, therefore, taken out of flood hazard.

Response 20

The comment states that "usurping the floodplain of the river can have serious immediate and long-term repercussions on the hydrology of the river and on channel morphology, both upstream and downstream." First, the comment provides no factual support for this claim. Second, the comment is general and conclusory, making it difficult to provide a precise response. However, the reader is referred to the Landmark Village Draft EIR, which extensively evaluated and found no significant impacts on the hydrology of the River or its channel. Please see Landmark Village Draft EIR, Section 4.2, Hydrology, pp. 4.2-1 through 4.2-64; Section 4.3, Water Quality, pp. 4.3-20 through 4.3-22, and 4.3-48 through 4.3-116; and Section 4.5, Floodplain Modifications, pp. 4.5-1 through 4.5-72.

The comment also suggests that the Floodplain Avoidance Alternative or a lesser damaging environmentally sensitive alternative should be adopted to avoid hydrology impacts. See, **Response 10**, above; see also, Draft EIR, Section 5.0, Project Alternatives, p. 5.0-18, which concludes:

> "Generally, under Alternative 3 [Floodplain Avoidance] impacts associated with geotechnical and soil resources, hydrology, traffic/access, air quality, noise, biota, cultural/paleontological resources, visual qualities, solid waste services, mineral resources, and floodplain modifications would be reduced when compared to the proposed project. On the other hand, this alternative would have greater impacts associated with water service, water quality, and parks and recreation. However, on balance, Alternative 3 would result in fewer impacts than the proposed project."

Furthermore, the Draft EIR states:

> "While Alternative 3 is considered environmentally superior to the proposed project, Alternative 3 does not meet many of the basic project objectives, which are set forth in this EIR, at Section 1.0, Project Description. Project objectives not fully met or impeded by Alternative 3 are listed below.
>
> "**(1) Land Use Planning Objectives**
>
> Land Use Planning Objective No. 2 states, "Consistent with the Specific Plan, accommodate projected regional growth in a location that is adjacent to existing and planned infrastructure, urban services, transportation corridors, and major employment centers and that avoids leapfrog development."
>
> Because Alternative 3 would significantly reduce housing and commercial uses, and, therefore, reduce accommodations for projected regional growth, this alternative is not consistent with this project objective.
>
> Land Use Planning Objective No. 4 states, "Provide development and transitional land use patterns that do not conflict with surrounding communities and land uses."
>
> Alternative 3 would create a fragmented area of agricultural property adjacent to residential and commercial uses and, therefore, does not meet this project objective.
>
> Land Use Planning Objective No. 5 states, "Establish land uses that permit a wide range of housing densities, types, styles, prices, and tenancy (for sale and rental)."
>
> Alternative 3 is inconsistent with this project objective, as it would result in a substantial reduction in residential units (approximately 20 percent reduction), thereby reducing housing options for the site.
>
> Land Use Planning Objective No. 7 states: "Create a highly livable, pedestrian-friendly environment that encourages alternative means of transportation to the automobile by incorporating unique site designs and enhanced pedestrian access between land uses, trails, paseos, and streets."
>
> Alternative 3 is inconsistent with this project objective because it would eliminate the majority of the commercial floor area on site, commercial uses that are necessary to promote livability of the project and the creation of a pedestrian friendly environment and enhanced pedestrian access between land uses.
>
> **(2) Economic Objectives**
>
> Economic Objective No. 1 states, "Provide a variety of residential homes, which would respond and adjust to changing economic and market conditions."
>
> Alternative 3 does not meet this project objective as the alternative results in a substantial reduction in residential units, thereby accommodating less housing for regional growth projections.

Economic Objective No. 2 states, "Provide a tax base to support public services and facilities."

Alternative 3 is inconsistent with this project objective as it would cause a substantial reduction in residential and commercial land use on site, resulting in a substantial reduction in tax base to support the public facilities and services within the project area.

(3) Mobility Objectives

Mobility Objective No. 1 states, "Implement the Specific Plan's Mobility Plan, as it relates to the Landmark Village project, including the design of a circulation/mobility system that encourages alternatives to automobile use."

Alternative 3 does not meet this project objective because it is inconsistent with the Specific Plan's Mobility Plan and the circulation/mobility system within the Specific Plan. This alternative eliminates the majority of the commercial floor area on site, commercial uses that are necessary to promote livability of the project and the creation of a pedestrian friendly environment and enhanced pedestrian access between land uses.

(4) Parks, Recreation, and Open Area Objectives

Parks, Recreation, and Open Area Objective No. 2 states, "Provide a range of recreational opportunities, including parks, trails and paseos, which are convenient and accessible."

Alternative 3 is inconsistent with this project objective because it would result in a substantial reduction in trails and paseos on the project site.

Parks, Recreation, and Open Area Objective No. 3 states, "Provide pedestrian, bicycle, and hiking trails that are consistent with the Specific Plan's Parks, Recreation, and Open Area Plan."

Alternative 3 does not meet this project objective because it would result in a design that is inconsistent with the Specific Plan's Park, Recreation, and Open Area Plan.

Previous Findings Related to this Alternative

As noted above, the County's Board of Supervisors already considered Specific Plan alternatives, two of which eliminated development within the Santa Clara River, including the 100-year floodplain (e.g., Alternatives 5 and 6). The Board rejected both alternatives as infeasible, in part, because such alternatives did not achieve many of the basic objectives of the Specific Plan, including the significant public benefits associated with implementation of such a plan. In addition, the Board of Supervisors considered the issue of the loss of portions of the 100-year floodplain due to Specific Plan development, and found that the bulk of the impacted floodplain acreage (approximately 121 acres) is non-sensitive biota habitat primarily within agricultural lands and other disturbed habitat." (Draft EIR, Section 5.0, pp. 5.0-18 through 5.0-20.)

Response 21

The comment states that Friends will submit a separate letter on traffic impacts. The comment does not raise any specific issue regarding that analysis and, therefore, no more specific response can be provided or is required. However, the comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project.

Response 22

The comment restates information contained in the Draft EIR, and it will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not raise an environmental issue regarding the content of the Draft EIR, no further response is required.

Response 23

The comment suggests one of two additional alternatives, which Friends believes should be analyzed, including omitting the bridge construction and the downstream section of buried bank stabilization as Friends believes neither is needed for development of the Landmark Village project. As previously indicated, Landmark Village is part of the Newhall Ranch Specific Plan. The approved Specific Plan and Conditional Use Permit No. 94-087-(5) permitted the use of buried bank stabilization in the area cited above, as well as three bridge crossings over the Santa Clara River, and the Long Canyon Road Bridge was among the three approved bridge crossings. The impacts associated with this bridge crossing and the bank stabilization have been analyzed at the programmatic level in the certified Newhall Ranch Specific Plan Program EIR and are analyzed at the project-level in the Landmark Village Final EIR. One of the benefits of having an approved Specific Plan is that it permits implementation of various components of that approved plan as components proceed to a project-level stage.

Additionally, the Landmark Village Draft EIR addressed four alternatives to the proposed project, consistent with Section 15126.6(a) of the *CEQA Guidelines*. (Draft EIR, Section 5.0.)

The County has determined that the four alternatives focus on alternatives to the project or its location, and are capable of avoiding or substantially lessening the identified significant effects of the project. It should also be noted that the Newhall Ranch Specific Plan addressed six alternatives to the Specific Plan. Overall, 10 alternatives have been analyzed. Therefore, no further analysis of additional alternatives is needed or required.

Response 24

The comment suggests a second alternative, which would provide a maximum 500-foot buffer between the urban edge and the riparian zone. The suggested alternative is not reasonable, in light of the data presented to the County regarding the width of the buffer needed along the southern boundary of the Landmark Village project in **Responses 13** and **16**, above.

Response 25

The comment that "unprecedented growth in the Santa Clara River watershed over the last few decades has caused an array of cumulative impacts to flora and fauna of the River corridor," is an overstatement of past impacts to the watershed. The comment is also unsubstantiated. Dudek prepared a Santa Clara River Watershed Study (Dudek 2007) to analyze the cumulative impacts of development, including past projects, current land use zoning, and future and approved projects in the Los Angeles County portion of the watershed, to biological and abiotic resources and ecological functions and processes in the watershed. While land conversion, in the form of agriculture, residential, commercial, and industrial urban uses has occurred in the Santa Clara River Valley and adjacent foothills, and substantial future development will occur, the vast majority of the watershed is comprised of natural lands. The additional impacts of the Landmark Village project, Newhall Land and Farming projects in general, and other planned and approved projects in the Los Angeles County portion of the watershed are relatively small in proportion to the overall watershed. Key findings of the Dudek watershed study include:

- The watershed is, and will remain, for the most part undeveloped – lands converted to agriculture and urban development comprise about 10 percent of the total watershed. Planned and approved projects in Los Angeles County (including the City of Santa Clarita) would increase the amount of development in the watershed by about 3 percent.

- The watershed has very substantial existing public lands and planned open spaces that will be protected in perpetuity. Based on current public lands and currently zoned open space, approximately 71 percent of the watershed (733,526 acres) is existing or zoned open space.

- Under current land use zoning important biological and physical features of the overall watershed would be retained. The major vegetation communities (coastal scrubs, chaparral, non-native grassland, woodlands and forest, and riparian/wetlands) are still and will remain relatively common in the watershed.

- Newhall lands are a very small proportion (<2%) of the overall watershed and are limited to a small area in the southern portion of the watershed. Planned development on Newhall property (including the Landmark Village project) would impact only 1 percent of the total watershed and would be 26 percent less than the amount of development allowed on Newhall lands under the current land use zoning.

- Planned development on Newhall property is downstream of substantial existing, planned, and approved urban land uses in Santa Clarita and Valencia and occurs in the lower elevation areas of the watershed, thus protecting headwaters and upper portions of sub-basins within the watershed and the functions and values these sub-basins provide.

- Regional wildlife corridors and habitat linkages will be preserved in the watershed.

In short, the comment overstates the level of cumulative impacts to the watershed as a whole. Encroachment by past development (including agriculture) has caused habitat loss and fragmentation; however, the Santa Clara River is still considered a natural river system and still provides habitat for several listed, threatened, or endangered species such as the least Bell's vireo, southwestern willow flycatcher, unarmored threespine stickleback, and arroyo toad, as well as a number of non-listed special-status species. In acknowledging the importance of protecting the River corridor and its resources from future development impacts, the Valencia Company (a division of The Newhall Land and Farming Company) prepared the Natural River Management Plan (NRMP), which is a long-range management plan to protect the Santa Clara River and maintain its natural functions within Newhall lands between its confluence with Castaic Junction on the west end to one-half mile upstream of the Los Angeles Aqueduct and portions of San Francisquito Creek and the South Fork of the Santa Clara River. For the Specific Plan lands west of this reach, the project applicant has prepared the Specific Plan's Resource Management Plan (RMP) (Section 2.6 of the Specific Plan) that was approved by the County Board of Supervisors in 2003 and which, as the initial framework for resource management, set forth conceptual mitigation and management standards for sensitive biological resources within the boundary of the Specific Plan. A similar project-level plan is being prepared for the proposed Newhall Ranch Resource Management and Development Plan. This plan will guide future resource conservation, mitigation, and permitting by the Corps and CDFG for the long-term management of sensitive biological resources in conjunction with the infrastructure improvements and facilities approved under the Newhall Ranch Specific Plan.

The comment also states that "cumulative impacts are not adequately addressed in the DEIR." The County does not concur with this statement. The Landmark Village Draft EIR, Section 3.0, discusses approved, proposed, and reasonably foreseeable future projects, including other project components of the Newhall Ranch Specific Plan, Mission Village, and Homestead. Twenty-two additional related projects that support or would potentially affect similar plant communities, jurisdictional resources, and special-status plant and animal species also were analyzed. These projects include the Valencia Commerce Center, West Creek project, Entrada, Tesoro de Valle (Upper San Francisquito Creek), Cross Valley Connector (Newhall Ranch Road including the Newhall Ranch Road/Golden Valley Road Bridge), North Valencia Specific Plan No. I (Industrial Park), North Valencia Specific Plan No. II, Riverpark, Bouquet Canyon Bridge Widening, Whittaker–Bermite (Porta Bella Project), Synergy Project, Tick Canyon, Bee Canyon, Tract 42760, Fair Oaks Ranch, Santa Clara River Enhancement and Management

Plan, Gate King project, Transit Mix Soledad Canyon Mine, Los Angeles County Sanitation District's Facilities Plan, Castaic Lake Water Agency Reclaimed Water Master Plan, Castaic Junction, and the Newhall Ranch Resource Management and Development Plan/Spineflower Conservation Plan.

The comment also cites a statement in the USFWS "Biological Opinion for the Valencia Company's Clean Water Act Section 404 Authorization for Portions of the Santa Clara River, Los Angeles County, California" regarding impacts to the Santa Clara River and listed species, followed by the statement that after 10 years, "massive projects" continue to impact the river. No factual support is provided to support the claim. Nonetheless, on the basis of these claims, the comment asserts that "[t]he DEIR must completely reexamine cumulative impacts of the Santa Clara watershed impacts and evaluate effectiveness of mitigation for these impacts." As discussed above, the Dudek Draft Watershed Study has compiled projects and associated impacts in the watershed, and has concluded that the development proposed in the watershed will not significantly impact biological resources.

Response 26

Please see **Topical Response 3**: EIS/EIR Project, with regard to the review process of the Landmark Village EIR and the related EIS/EIR Project being prepared by the Corps and CDFG.

Response 27

The comment expresses the opinion of Friends. No further response is required.

Response 28

The comment states the cumulative impacts must be analyzed, understood, and mitigated and, if approval is granted, the floodplain alternative or a less damaging alternative should be adopted. The County believes that cumulative impacts have been addressed in each environmental topic in the Landmark Village Draft EIR. In addition, the Dudek Watershed Study (June 2007) conducts the cumulative impact assessment of the watershed, as requested in this comment.

The comment's preference for the floodplain avoidance alternative or a lesser damaging alternative is noted. The comment expresses the opinions of Friends. The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project.

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January 22, 2007

Mr. Daniel Fierros
County of Los Angeles
Department of Regional Planning
Impact Analysis Section, Room 1348
320 West Temple Street
Los Angeles, A 90012

Re: Comments on the Landmark Village Draft Environmental Impact Report, County Project No. 00-196

Dear Mr. Fierros:

On behalf of Heal the Bay, we submit the following comments on the *Landmark Village* ("Project") *Draft Environmental Impact Report, County Project No. 00-196* ("DEIR"). We appreciate the opportunity to provide these comments. 1

In general the DEIR does not adequately consider alternatives that would enable the project to proceed with the least environmental damage and does accurately describe the environmental risk to decision makers. Therefore, the Los Angeles County Regional Planning Commission should not certify the EIR as written. Our concerns with water quality, hydrology, and biological resources impacts are described in further detail below. 2

The Santa Clara River ("River") is the largest wild river remaining in southern California. It provides crucial aquatic ecosystem functions in the region, including groundwater recharge and riparian habitat for endangered and rare species. It is also a significant input to southern California's coastal waters at the City of San Buenaventura. Thus, it is imperative that development occurring within the Santa Clarita River watershed proceeds in a manner that protects and restores the water quality and aquatic ecosystem functions of this important river system. In 2005, the Santa Clara River was named the "10th Most Endangered River" in the Country by the American Rivers organization in part because of the imminent threat of development. 3

Our over-arching concern with this project as outlined in the DEIR is that it impinges upon the natural functioning of the River to such an extent that significant, immitigable damage will be done to water quality and aquatic habitat. Specifically: 4

- There is an insufficient buffer zone (undeveloped vegetated area) provided between developed areas and the River.
- There are extensive areas of stream bank alteration, in the form of hardened structures for stabilization, including buried bank stabilization, which are known to increase erosion/sedimentation problems and decrease aquatic and riparian habitat. 5

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- The analyses are fatally flawed and do not accurately present the true impacts of the proposed development at the project site and downstream to water quality, biological resources and downstream property owners. 6
- Significant development occurs within the 100-year floodplain of the River. 7

Water Quality – Section 4.3

Integrated water resources planning should be considered in the project design. 8

Efforts such as the Los Angeles County Integrated Regional Water Management Plan and the City of Los Angeles Integrated Resources Plan highlight the need for integrated water resources planning in the region. However, the DEIR does not appropriately address aspects of integrated 9 planning for the project. For instance, why is all of the storm water being directed off-site? 10 Are there no plans for water reclamation or infiltration? The DEIR should consider integrated water resources planning as a way to address some of the potential impacts from the project. 11

Fill and grading projects should be appropriately mitigated.

The project requires 5.8 million cubic yards of fill and significant grading activities at the Adobe Canyon Borrow Site and the Chiquito Canyon Grading Site. DEIR at 39. This is an enormous amount of cut and fill, yet there are no specific grading restrictions outlined in the DIER. For a proposed project of this magnitude in proximity to an important waterbody, extra precautions should be required. For example, there should be no grading within 500 feet of the River or any tributary or on steep slopes (steeper than 4:1). Also, there should be no grading activity during the rainy season (November through April). On many occasions Heal the Bay staff has witnessed the disastrous effect of grading, even at much smaller projects, when a rainstorm occurs. For instance, there were disastrous sediment discharges from the much smaller Shea Homes project in Agora Hills that were documented by the Regional Water Board and Fish and Game in 2003/2004. The basic best management practices ("BMPs") are not sufficient to prevent massive sediment inputs to creeks when hillsides are graded and exposed to rainfall. These restrictions should be specified in the DEIR. 12 13 14 15 16

Pollutant concentrations and loadings should not be directly compared to the existing agricultural use pollutant concentrations and loadings. 17

The DEIR compares all pollutant concentrations and loadings to the existing conditions with the agricultural site. This comparison is inappropriate. Pollutant concentrations in the runoff should be evaluated based on potential impacts to water quality. Various reaches of the Santa Clara River are listed on the State's 303(d) list as impaired by various constituents. Specifically Reach 5 is listed for chloride, high coliform and nitrate and nitrite, and a TMDL has been adopted for Nitrogen and Ammonia. Regardless of whether or not the land use remains agricultural or the proposed development takes place, the owners must comply with all existing TMDLs or will be in violation of the Clean Water Act. 18

Ultimately the County and City of Santa Clara will be responsible for meeting TMDLs that exist for waterbodies in the project area. Clean-up measures are extremely expensive. These costs 19

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will likely be passed on to the tax payers. We strongly urge that any development not further impair water quality in 303(d) listed waters. Any costs associated with runoff from the project should be placed on the property owners or the developers. 19

The estimated nutrient concentrations may lead to excess algal growth.

The DEIR predicts that average annual nitrate + nitrite concentrations will be 0.5 mg/l and total phosphorus will be 0.3 mg/l. Data show that these concentrations may impact the water quality. For instance, data collected in the Malibu Creek Watershed by Heal the Bay's Stream Team between the period of November 1998 and November 2004 show that algal cover in Malibu Creek consistently exceeds 30% when nitrate is <0.05 mg/l and phosphate is above 0.15 mg/l. Lawn care practices in the development may increase the nutrient levels significantly. Thus, the discharges of nutrients from the development will likely contribute to water quality impacts. 20

BMPs should be maintained and monitored in perpetuity.

Some of the proposed water quality BMPs will be maintained by homeowner associations. This does not ensure ongoing water quality protection because there is no regulatory oversight of these associations. All water quality protection measures should be the responsibility of the developer. Alternatively the homeowners associations should at least be required to sign binding agreements with such government agencies requiring the homeowners associations to perform specific maintenance, monitoring and reporting requirements, depending on the BMP. Without maintenance, monitoring and reporting follow-up, there is no point in using BMPs since there will be no way of determining whether a given BMP is effective in mitigating water quality impacts. 21

The water quality impacts for all drainages in the project area should be evaluated.

The DEIR states that "[f]our other drainages within or adjacent to the project site are also considered 'waters of the U.S'…." DEIR at 4.2-12. There is little to no mention of these drainages in the document. Were impacts to these considered in the DEIR and are there proposals for mitigation measures? This analysis should be included in the DEIR and appropriate mitigation measures and setbacks should be required. 22

Water quality impacts from the new wastewater treatment facility should be considered in the DEIR.

The downstream water quality impacts of increased nutrient and bacteria loading from the proposed wastewater treatment plant are not addressed in the DEIR. Will the combination of pollutants from wastewater discharges and storm water discharges prevent compliance with TMDLs? Also, where will the sewer lines and water supply lines be placed and how will this impact aquatic and riparian resources onsite and downstream? Without further details regarding discharges of wastewater and its impacts to water quality, there is not sufficient information for decision makers to evaluate impacts of this project. This constituents a fatal flaw in the DEIR. 23 24

Appropriate actions should be taken to avoid the spread of exotic species.

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Recent aquatic invertebrate surveys in the Malibu Creek watershed have confirmed the presence of the New Zealand mudsnail, an insidious exotic invasive species that could potentially wreak havoc on the watershed's native organisms. The mudsnail has also been found in Piru Creek in the Santa Clara River watershed. The DEIR describes various construction activities that will take place in the River. In order to avoid the spread of this exotic species, the developer should include a strict protocol that will be implemented to prevent its spread. Anyone having contact with the River due to this project should complete a HACCP to prevent the spread of the mudsnail further into the watershed. 25

Hydrology -- Section 4.2

The Project should avoid any hard armoring of the stream bank. 26

The DEIR estimates that there will be a 148 acre-ft per year increase in runoff, despite proposed mitigation measures. DEIR at 4.4-77. (The actual runoff and pollutant loading estimate would be greater if the applicant would use more appropriate models and not bulk and burn calculations.) Small increases in flow can result in massive erosion problems over time. In order to "mitigate" the impacts of these flows, the DEIR proposes the use of buried cement bank stabilization, bridge piers and abutments, rip-rap, and energy dissipaters. Specifically, 18,600 linear feet of buried soil cement and 11 bridge piers are proposed in the project area. DEIR at 4.2-35. Any of these structures or modifications will affect the hydrology of the stream even if only in localized areas. Anytime natural processes are altered, there are substantial downstream impacts. 27

The long-term effects of stream bank/bed modifications include increased scouring, increased erosion, and increased downstream deposition of eroded material, which degrades downstream habitat. As a result native vegetation are often washed out, eliminating the ability for pollutant removal. Also, eroding stream banks contribute fine sediment to streams. Fine sediments contribute nutrients, bacteria, and bury important spawning habitat for steelhead trout. Heal the Bay's Stream Team mapped 70 miles of stream in Malibu Creek Watershed between 2001 and 2003. They found that 19.8 (28%) linear stream miles of armoring resulted in 18.7 (27%) linear miles of eroding stream banks. 28

The best ways to avoid increased erosion/deposition effects are to (1) keep all structures and utilities outside the 100-year floodplain or the 500 foot riparian buffer of the River (whichever is greater); (2) use only soft bioengineering techniques to stabilize stream banks. (No armoring of stream banks). Bioengineering is preferable because it allows the river to maintain a natural dynamic balance. It also requires less maintenance over time as there are no concrete or other hard structures to eventually fail and be replaced. Bioengineering also provides natural riparian habitat that maintains water quality and wildlife habitat; 29 30 31

We strongly recommend that the space between vertical support columns be increased to the maximum extent possible to provide for less obstruction and less impact on wildlife migration. Additionally we believe that the bridge height should be increased to minimize noise and light impacts that could deter aquatic and terrestrial wildlife migration. A light-penetrating surface 32 33 34

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should also be used to provide light for the organisms below. Plant growth below the bridge will provide for migrating wildlife and enhance stabilization. 34

In sum, the Santa Clara River supports numerous endangered, threatened and rare aquatic species that must be protected from the deleterious erosion and deposition effects of stream bank/bed modifications. The DEIR fails to analyze the impacts that the project will have to both water quality and habitat quality in the Santa River and other impacted drainages. Without this information, decision makers can not evaluate the true impacts of this project, which is a fatal flaw of the DEIR. Therefore, the project must be modified to avoid all armoring. 35

The amount of impervious surface should be greatly decreased.

A key factor in the degradation of stream water quality is the proportion of impervious surfaces versus pervious surfaces in the watershed.[1] Heal the Bay's State of the Watershed concluded that "[o]ur imperviousness data and BMI data indicate a trend of increasing imperviousness associated with decreasing mean IBI scores." Further, the State of the Watershed Report finds that there is serious degradation to BMI with effective imperious surfaces as low as 5%. Hollis (1995) states that even "low levels of impervious cover (5 to 10 percent) are capable of increasing the peak discharge rate by a factor of 5 to 10 for storms smaller than the one year storm." 36

While Schueler (1995) comments that "more impervious cover directly translates into higher peak discharge rates, greater runoff volumes, and higher floodplain elevations," detention ponds are most commonly constructed to mitigate these effects. The primary goal of stormwater detention ponds is to reduce the peak discharge rate by slowly releasing water over a longer period of time. Therefore, the total volume of runoff is the same with or without the detention pond, the only difference is that discharge lasts for a longer amount of time. Thus, the proposed BMPs will not solve many of the problems created by increased runoff volumes from the development. 37

Table 4.2-1 provides the percent imperviousness for selected land uses. These numbers should be reduced. The DEIR should consider alternatives such as increasing the density of the housing or reducing the number of houses so that the % impervious is decreased below 5%. Maintaining 5% or less effective impervious area will ensure viable biological communities. 38

The DEIR's calculations for bulk and burn are misleading.

The DEIR states that "[o]uce developed, the Landmark Village project would reduce post-development stormwater flows during a capital storm event." DEIR at 4.2-1. Further, the DEIR asserts that the project will decrease the total debris volume and burned and bulked runoff. DEIR at 4.2-4. We completely disagree with this statement. Using this methodology, the DEIR concludes that a undeveloped site will be dirtier and produce more runoff than an developed site. This assertion is ridiculous. 39

[1] Center for Watershed Protection, 2003. Impacts of impervious cover on aquatic systems. Watershed Protection Research Monograph 1. 158 pp. http://www.cwp.org/Downloads/

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The pre-development pollutant loading analyses used the LA County "bulk and burn" runoff estimates, which provide unrealistically high flow and pollutant estimates most of the time. Given the return frequency of major fires in the region, it is extremely unlikely that most rain events will generate the equivalent of the amount of water and pollutants estimated in the "bulk and burn" method. We understand that this is the standard calculation used in the LA County stormwater manual; however, while it may be appropriate for sizing bridges and culverts, it is entirely inappropriate for calculating pollutant loads and runoff volumes at a development site. 40

We feel it is imperative that the project proponent also analyze stormwater flow and loadings under normal, non-bulk and burned conditions and we urge the County to require such analyses for flow and pollutant loadings in this DEIR, in order to achieve a realistic estimate of pre- and post-development pollutant loads to the River. Without such an analysis, it is impossible for decision makers to evaluate on-site and downstream impacts that the project will have on water quality. 41

All development should take place out of the floodplain.

The proposed Landmark Village project impinges upon the 100-year floodplain of the River. As stated in the DEIR, 103.5 acres are within the FEMA floodplain. DEIR at 4.2-29. There is absolutely no reason why housing needs to be placed in the 100-year floodplain, thus necessitating stream bank stabilization measures (i.e. stream bank hardening) to then protect those homes in the floodplain. Any development in the Santa Clara River watershed must occur well outside the 100-year floodplain or outside of the 500 foot riparian buffer (whichever is greater) and as discussed below must maintain vegetated buffers in order to protect the water quality and ecosystem functions of the River. 42

<u>Biota – Section 4.4</u>

A 500 foot riparian buffer should be required for all development activities.

As acknowledged in the DIER, "[t]he river is an important migration and genetic dispersion corridor for many wildlife species, including aquatic taxa, riparian obligate species (resident and migratory), and larger more terrestrial animals." DEIR at 4.4-27. Numerous riparian plant communities have been observed on the project site. For instance, there are documented populations of elderberry scrub, mulefat scrub, southern willow scrub, river wash, freshwater marsh, alluvial scrub, great basin scrub, and scalebroom scrub. In addition, there are numerous special-status riparian plant species on-site such as the late-flowering mariposa lily, Los Angeles sunflower, southwestern spiny rush, Davidson's bush mallow, California Muhly, mud nama, spreading navarretia, Gambel's watercress and Sonoran maiden fern documented in the project area. DEIR at 4.4-33. In addition, there are numerous animal communities that inhabit the riparian corridor. Tables 4.4-5 and 4.4-6 of the DEIR outline the special-status wildlife species that were observed on-site or are likely to occur on-site. Many of these species inhabit the riparian zone such as the Lawrence's goldfinch, Northern harrier, Arroyo toad, Western spadefoot toad, and San Bernardino ringneck snake. There are also federally listed aquatic species present or that may be present at the project site or downstream. 43

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Dr. Philip Rundel stated in his written comments on the proposed Ahmanson Ranch Project that "[r]iparian ecosystems are keystone habitats in Southern California and play a critical role in a variety of ecosystem processes… these ecosystems act to buffer hydrologic and erosional cycles, control and regulate biogeochemical cycles of nitrogen and other key nutrients, limit fire movements, and create unique microclimates for animal species. Both terrestrial and aquatic wildlife depend on riparian ecosystems with their year-round availability of water, nutrients, food sources, and organic sediments … It is not surprising, therefore, that riparian ecosystems are centers of high biodiversity."[2] In addition, scientific evidence clearly demonstrates that buffer zones, or intact areas of natural vegetation, are crucial to the protection of water quality.[3] 43

Although the DEIR claims that an appropriate riparian buffer is being included in the project design to protect these species, the impact analysis in Section 4.4 refutes this assertion. Table 4.4-8 shows the acreage of each plant community/land use that would be developed or temporarily disturbed. A large percentage of the riparian plant communities described above would be completely destroyed or severely impacted by the project. For example of the 6.93 acres of scalebroom scrub currently on-site, 4.27 acres will be permanently destroyed and 2.67 acres will be temporarily impacted. This means that the entire community will be impacted. If a riparian buffer is proposed, how is this riparian community completely impacted? 44

The DEIR acknowledges that the loss of habitat due to the project would be significant. "…[T]he loss of wildlife habitat would adversely affect numerous common and special-status wildlife species, including the silvery legless lizard, rosy boa, San Bernardino ringneck snake, coast horned lizard, coast patch-nosed snake, northern harrier, white-tailed kite, southern rufous-crowned sparrow, Bell's sage sparrow, western burrowing owl, San Diego desert woodrat, pallid bat, mountain lion, and San Diego black-tailed jackrabbit." Further, the document states that this loss is "unavoidable." DEIR at 4.4-59 and 60. This claim is completely unfounded, and the huge impact to wildlife species is unacceptable. 45

The developer has obviously not considered reasonable alternatives to lessen this impact such as increasing the riparian buffer, increasing the density of homes, and/or building fewer homes. If there is an appropriate riparian buffer, then the risk to these species - many of which are endangered or special-status - is greatly reduced. A minimum 500 foot buffer, as measured from the outside edge of the riparian canopy (not from the edge of the bank stabilization as proposed on page 4.4-61.), or a restriction to not build in the floodplain whichever is greater, should be required for this project due to its size and the nature of the River. This sizable buffer is 46

[2] Letter from Dr. Philip Rundel to Dennis Hawkins, dates April 26, 2002.

[3] See these references: "National Management Measures to Control Nonpoint Source Pollution from Urban Areas" (http://www.epa.gov/owow/nps/urbanmm/index.html, last updated 8/8/2003); Herson-Jones et. al. 1995, cited in the aforementioned EPA document; Wenger, S. J. & Fowler, L. (2000) Protecting Stream and River Corridors, Creating Effective Local Riparian Buffer Ordinances. *Policy Notes*. Public Policy Research Series, Carl Vinson Institute of Governments, the University of Georgia. 1(1):1-2; Wegner, S. (1999) A Review of the Scientific Literature on Riparian Buffer Width, Extent and Vegetation. Office of Public Service & Outreach, Institute of Ecology, University of Georgia; Basnyat, P., Teeter, L. D., Flynn, K. M., & Graeme Lockaby, B. (1999). Relationships between Landscape Characteristics and Nonpoint Source Pollution Inputs to Coastal Estuaries. *Environmental Management* 23(4):539-549; and US EPA (2002) National Management Measures to Control Nonpoint Source Pollution From Urban Areas-Draft. Office of Wetlands, Oceans and Watersheds, Nonpoint Source Control Branch, Washington D.C.

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necessary for many reasons including that "[a] number of studies have found that even the more riparian-dependent wildlife species also require adjacent upland habitats…" and "[a]royo toads have been found in agricultural fields and occur within portions of the site outside of the proposed riparian setback zones." DEIR at 4.4-60. In general, the purpose of the buffer is to protect the riparian areas from filling, devegetation and encroachment by human development. Grading, development, and BMPs should not be allowed in the buffer. Also, the fuel modification zone should not interfere with the buffer zone. 46 47

In addition, a mitigation ratio of 2:1 should be employed for disturbance to areas of riparian and oak habitat that can absolutely not be avoided. This ratio will ensure that in the long term, a 1:1 ratio will be established. Further, mitigation must occur on-site. The mitigation proposed is completely inadequate and should be dramatically increased. 48

The DEIR should address downstream species impacts.

The DEIR addresses species found in the immediate area of the project but fails to address potential impacts to those species located downstream such as steelhead and the red-legged frog. For example, Table 4.4-7 of the DEIR indicates that wildlife species such as the steelhead rainbow trout are "not expected on the Project Site." However, the steelhead trout is a federally listed species that is present downstream and thus should be evaluated. The steelhead will likely be affected by the changing stream flows, temperatures, and sedimentation rates. Why did the Newhall Ranch developers apply for a 1998 Incidental Take Permit for steelhead and red legged frog if the developer did not think downstream impacts would occur? These species should be considered as well. 49

If you have any questions or would like to discuss any of these comments, please feel free to contact us at (310) 451-1500. Thank you for your consideration of these comments. 50

Sincerely,

Kirsten James
Staff Scientist

Mark Abramson
Stream Team Manager

8

D13. Letter from Heal the Bay, dated January 22, 2007

Response 1

This comment is an introduction to comments that follow. No further response is required.

Response 2

Heal the Bay states, generally, that the Landmark Village Draft EIR does not adequately consider alternatives. The Draft EIR's assessment of alternatives is adequate under CEQA and the *CEQA Guidelines*. Please see Draft EIR, Section 5.0, Project Alternatives, pp. 5.0-1 through 5.0-35. Nonetheless, Heal the Bay's comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not address or question the content of the Draft EIR, no further response is required.

Response 3

The comment provides factual background information that will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not raise an environmental issue regarding the content of the Draft EIR, no further response is required.

Response 4

The comment expresses a concern that the project "impinges upon the natural functioning of the River to such an extent" that significant, unmitigable damage will occur to "water quality and aquatic habitat." The Draft EIR, Section 4.5, Floodplain Modifications, at pp. 4.5-70 through 4.5-71, summarized impacts to the River and aquatic habitat as follows:

> "The proposed project would place bank stabilization along selected portions of the river, developing areas behind the bank stabilization, and installing a bridge across the river. These actions would alter flows in the river; however, the effects would only be observed during infrequent flood events that reach the buried bank stabilization. The proposed project would cause an increase in flows, water velocities, and water depth. However, these hydraulic effects would be minor in magnitude and extent. These effects would be insufficient to alter the amount, location, and nature of aquatic and riparian habitats in the project area and downstream. Under the project, the river would still retain sufficient width to allow natural fluvial processes to continue. Hence, the mosaic of habitats in the river that support various sensitive species would be maintained, and the populations of the species within and adjacent to the river corridor would not be significantly impacted.

> These findings apply with equal force to other aquatic species dependent upon riparian habitat in the River Corridor SMA/SEA 23 that were not targeted for study in this section. Species such as the Arroyo Chub and Santa Ana sucker, which are expected to occur in the portion of the river adjacent to the project site, have both life history requirements and habitat preferences that are dependent upon aquatic habitat. As described above, the project improvements would not result in significant changes to flow, water velocities, or depth of the river, so the mosaic of habitats that support such aquatic species would be maintained."

In addition, based on the floodplain analysis contained in the Landmark Village Draft EIR, Section 4.5, Floodplain Modifications, at p. 4.5-72, it was found that the proposed project would not result in any significant unavoidable project or cumulative impacts to sensitive biological resources due to bank stabilization, bridge crossings, or changes in the floodplain due to project development.

The comment also claims that there is an insufficient "buffer zone" provided between developed areas of the Santa Clara River. The information presented below is responsive to this comment.

Habitat buffers along the Santa Clara River were analyzed in the Landmark Village Draft EIR, Section 4.4.9, pp. 4.4-60 through 4.4-61. See also, the revised **Section 4.4, Biota**, found in this Final EIR. This section cites the Impact Sciences (1997) study that conducted vegetation analyses, focused bird surveys (1,100 field hours), and small mammal trapping (1,200 trap nights) along the Santa Clara River and adjacent uplands.[13]

The Buffer Study collected data for plant species composition, canopy height, shrub/tree density, percent cover and other species-specific criteria in order to define high-quality versus low-quality upland habitat for wildlife use and diversity. The focused wildlife studies concentrated on riparian bird and small mammal use of high- and low-quality upland habitat and upland/riparian ecotone and utilized systematic survey methods, including time-area observations, belt-transect counts at different distances parallel to the Santa Clara River, small mammal trapping, scent stations, and remote cameras. The Buffer Study thus helped identify the special-status populations at risk and their habitat use patterns along the River corridor. For example, at the western study site about 63 percent of riparian-dependent birds were observed in riparian habitat, 14 percent were in edge habitat, 18 percent were in upland habitat (primarily dense big sagebrush scrub and coastal sage scrub at this site) within 50 feet of the riparian edge, 5 percent were in upland habitat between 50 and 100 feet of the riparian edge, and 1 percent (one observation) were in upland habitat between 100 and 150 feet from the riparian edge. No riparian-dependent birds were observed beyond 150 feet from the riparian edge. Combined 94 percent of the riparian-dependent bird observations were within 50 feet of the riparian edge (including the riparian habitat) and 99 percent were

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13 Please see **Appendix A** of this Final EIR for the "North Valencia Annexation Buffer Study, Draft," Impact Sciences, Inc., dated April 28, 1997 (Buffer Study).

within 100 feet. The Buffer Study also cited studies of least Bell's vireo in San Diego and Santa Barbara counties with findings that where the riparian corridor is relatively wide (>100 feet) vireos only foraged within 100 feet of the riparian edge and where the riparian corridor is more narrow (<100 feet) vireos ranged up to 300 feet from the riparian edge. The Buffer Study suggests that riparian buffers along the Santa Clara River should range from a minimum of 100 to 150 feet in width, depending on the quality of the upland habitat (a larger buffer width required if the upland habitat is of low quality). Thus, habitat enhancement in areas where the buffer is narrower could compensate for the smaller buffer. In addition, the Buffer Study recommended a wall at the edge of development to attenuate noise and lighting and to discourage human intrusion.

It also should be noted that a minimum 100 feet of high-quality upland habitat from the edge of riparian habitat is consistent with CDFG (Northern California-North Coast [Region 1]) buffer criteria for avoiding significant impacts to riparian species and habitats adjacent to urban development (CDFG 2001).[14] In developing the buffer criteria, CDFG stated that "[d]epartment biologists have relied on scientific research and literature and professional experience to develop the following recommendations to protect the public's fish, wildlife and native plant resources." For example, CDFG recommends a 75-foot buffer from the outside edge of the riparian habitat for the Sacramento River, a 50-foot buffer for main tributaries, and a 25-foot buffer for secondary tributaries. CDFG also stated that "[i]f development restrictions related to mandatory requirements do not allow a project to completely avoid the area of the buffer zone outside the riparian vegetation, the project proponent may average the setback distance along the riparian habitat for the length of the project." Therefore, there is some flexibility in the minimum buffer width as long as the average width criteria are met.

Before addressing buffer issues for the Landmark Village project, it is important to understand that the buffer between the Santa Clara River and development was addressed and heavily debated during the Newhall Ranch Specific Plan environmental review and approval process. Prior to final Specific Plan approval, the County Board of Supervisors required that the Specific Plan design be revised to incorporate a 100-foot-wide setback (top of bank stabilization to residential, commercial, mixed use development) to protect riparian habitat and special-status species within the River Corridor SMA/SEA 23 boundaries. This setback is in addition to an average buffer width of 100 feet from the top of bank stabilization to existing riparian resources. This finding was arrived at after evaluating the potential impacts of the proposed land uses along the entire length of the River (consistent with the Kelly and Rotenberry recommendations), coupled with the existing habitat protection and enhancement provisions contained in the Specific Plan's Resource Management Plan and Design Guidelines. The overall buffer

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14 Please see **Appendix A** of this Final EIR for the CDFG (Northern California-North Coast, Region 1) buffer criteria.

area is comprised of several components: (1) the Salt Creek wildlife corridor connection and the High Country half-mile-wide buffer at the westerly end of the Specific Plan on the south side of the River; (2) native upland habitats in the Open Area along the south side of the River; (3) disturbed areas in the River corridor that will be restored or enhanced as riparian habitat; (4) buried bank stabilization that will be revegetated with native riparian and upland plant species; and (5) landscaped open space areas such as community parks, the Regional River Trail, and community trails.

In approving the Specific Plan and Conditional Use Permit No. 94-087-(5), the Board of Supervisors found that the Specific Plan contained sufficient natural vegetative cover and open space to buffer critical resources in the River Corridor SMA/SEA 23 from the development shown in the Specific Plan. The Board of Supervisors further found that the Specific Plan incorporated extensive buffer area to protect critical resources within the Santa Clara River. The Specific Plan's adopted Resource Management Plan requires a minimum 100-foot-wide setback adjacent to the Santa Clara River between the top river-side of the bank stabilization and development within certain specified land use designations (including those of the Landmark Village project site) unless through Planning Director review, in consultation with the County staff biologist, it is determined that a lesser buffer would adequately protect the riparian resources within the River Corridor SMA/SEA 23, or that a 100-foot-wide setback is infeasible for physical infrastructure planning. Again, these buffer criteria are consistent with the Impact Sciences and CDFG recommendations described above.

This buffer analysis does not presume that indirect effects on sensitive biological resources in the river corridor will not potentially occur as a result of development. In combination with the 100-foot setback, the Specific Plan's Resource Management Plan provides standards by which biological resources will be managed during construction and for the life of the community, including provisions for: (1) restoration and enhancement of disturbed areas; (2) restrictions on pedestrian and vehicular access to the river corridor; (3) design standards for transition areas between development and the river; (4) conveyance of conservation easements; and (5) preparation of a financial plan and the long-term management of the riparian resources by the Center for Natural Lands Management.

The Landmark Village project would maintain a 100-foot setback between the top of the bank and proposed residential, mixed-used, and commercial development. Based on the site-specific analysis conducted in the Draft EIR, the Landmark Village buffer is consistent with the approved Specific Plan. However, as noted above, the buffer and setback associated with the Landmark Village project does not imply no potential for indirect effects. Specific to the Landmark Village project, potential long-term indirect effects are analyzed in Section 4.4 of the Draft EIR, pp. 4.4-85 through 4.4-92, including increases in: (1) pesticides, herbicides, and pollutants; (2) lighting and glare impacts on wildlife species; (3) non-native plant and wildlife species; and (4) human activity and domestic pets. The Project Design Features

(PDFs) and mitigation measures to reduce these potential indirect impacts are also discussed in the Draft EIR.

PDFs to address urban runoff from irrigation and stormwater include site design, source control, treatment control, and hydromodification control Best Management Practices (BMPs). Stormwater runoff from all urban areas within the Landmark Village project will be routed to bioretention areas, vegetated swales, and/or extended detention basin treatment controls BMPs. The effectiveness of these PDFs to maintain water quality in the Santa Clara River was analyzed by GeoSyntec Consultants.[15]

The mitigation measures to address the other listed potential indirect effects include previously incorporated measures from the Newhall Ranch Specific Plan Program EIR and additional measures recommended by EIR. Significant impacts related to buffers and edge effects and mitigation measures to reduce the level of impact include:

- Restriction of Wildlife Habitat Linkages – mitigated by previously incorporated mitigation Measure SP 4.6-18.
- Increased Light and Glare – mitigated by previously incorporated Mitigation Measure SP 4.6-56.
- Increase in Populations of Non-native Plant and Wildlife Species – mitigated by the Landmark Village EIR Mitigation Measures LV 4.4-28 and LV 4.4-31.
- Increased Human and Domestic Animal Presence Within SMA/SEA 23 – mitigated by previously incorporated Mitigation Measures SP 4.6-17 through SP 4.6-19 and Landmark EIR Mitigation Measures LV 4.4-32 through LV 4.4-34.

Response 5

As noted in **Responses 2** and **4** to letter **D12** from Friends of the Santa Clara River, dated January 21, 2007, most of the bank protection is outside of the existing riparian corridor. Additionally, the soil cement will be buried and restoration activities will occur on top of and adjacent to the bank stabilization. A fluvial study for all of Newhall Land's development west of I-5 (including Newhall Ranch) entitled, *Newhall Ranch River Fluvial Study Phase 1 Final Report Santa Clara River*, approved by LACDPW (April 18, 2006), concluded that build-out of Newhall Land's communities west of I-5, including Newhall Ranch (of which Landmark Village is a part), will not significantly increase erosion or sedimentation.[16] The study examined general adjustment (bed change resulting from a single event), long-term adjustment (bed change occurring over many years), and local scour (bed change resulting from local effects such as bed

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15 GeoSyntec Consultants. September 2006. *Landmark Village Water Quality Technical Report* (see Draft EIR, Appendix 4.3).

16 The referenced Fluvial Study is found in Appendix 4.2 of the Landmark Village Draft EIR.

form, river bends and bridge piers). The fluvial study concluded that Newhall Land's development (including the installation of bank stabilization associated with Landmark Village) will result in a general bed adjustment range from 0.9 to -1.3 feet (Table 4.4) with an average bed change of approximately <0.1 feet. Due to this minor change in conditions, the impact is not considered significant.

Response 6

The comment addresses general subject areas, which received extensive analysis in the Draft EIR. The comment does not raise any specific issue regarding that analysis and, therefore, no more specific response can be provided or is required. However, the comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project.

Response 7

Please see **Responses 18** through **20** to letter **D12** from Friends of the Santa Clara River, dated January 21, 2007.

Response 8

The comment expresses the opinions of Heal the Bay. The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not address or question the content of the Draft EIR, no further response is required.

Response 9

LID/site design BMPs would assure that stormwater volume reductions would be attained before storm water is discharged offsite. Further, stormwater will be directed through vegetated treatment control BMPs within the project area prior to discharge to the Santa Clara River. These treatment control BMPs alone are expected to reduce average annual runoff volumes by 20 percent at a minimum, but are likely to reduce runoff volumes by as much as 40 percent or more, in addition to providing treatment to improve water quality. Vegetated treatment control BMPs also would allow for infiltration and evapotranspiration of all dry weather runoff and a portion of the stormwater runoff from the project area.

Response 10

The Newhall Ranch Specific Plan Water Reclamation Plant, analyzed in and approved pursuant to the previously certified Newhall Ranch Specific Plan Program EIR will reclaim most of the wastewater generated from the project for use as non-potable water supply. Over 50 percent of the Specific Plan's

water demand will be met by reclaimed water. Site design and vegetated treatment control BMPs will allow for infiltration and evapotranspiration of all dry weather runoff and a portion of the stormwater runoff from the project area. Taking into account only the volume reductions provided by the planned swales, bioretention areas, and detention basin, the average annual storm water runoff volume reduction is predicted to be 57 acre-feet/year.

Response 11

Integrated water resource planning concepts were considered, and incorporated into design and operation of the project. For example, treated effluent from the WRP will be used to supply distribution of recycled water throughout the Newhall Ranch Specific Plan area in the form of irrigation of landscaping and other approved uses.

Response 12

During construction, including the borrow source and grading activities of the project, impacts will be minimized through compliance with the State Water Resource Control Board's Construction General Permit and the MS4 Permit. The Construction General Permit requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP), which must include erosion and sediment control BMPs that will meet or exceed measures required by the Construction General Permit, as well as BMPs that control other potential construction-related pollutants. The MS4 Permit contains additional construction-related requirements, including incorporation of BMPs to control the discharge of pollutants to the maximum extent practicable. Both erosion and sediment BMPs will be employed during grading.

As discussed in the Draft EIR and in **Response 7** to letter from California Regional Water Quality Control Board, Los Angeles Region, dated January 22, 2007, erosion control BMPs are designed to prevent erosion, whereas sediment controls are designed to trap sediment once it has been mobilized. An SWPPP will be developed as required by, and in compliance with, the Construction General Permit and the County of Los Angeles Standard Conditions. The General Permit requires the SWPPP to include a menu of BMPs to be selected and implemented based on the phase of construction and the weather conditions to effectively control erosion and sediment to the BAT/BCT standard. BMPs that will be implemented during construction include the following erosion control BMPs:

- Physical stabilization through hydraulic mulch, soil binders, straw mulch, bonded fiber matrices, and erosion control blankets (i.e., rolled erosion control products).
- Limiting the area and duration of exposure of disturbed soils.

- Soil roughening of graded areas (through track walking, scarifying, sheepsfoot rolling, or imprinting) to slow runoff, enhance infiltration, and reduce erosion.
- Vegetation stabilization through temporary seeding to establish interim vegetation.
- Wind erosion (dust) control through the application of water or other dust palliatives as necessary to prevent and alleviate dust nuisance.

Additional erosion and sediment control BMPs that will be implemented are listed beginning on p. 4.3-63 of the Landmark Village Draft EIR. The project will implement enhanced erosion and sediment control BMPs during the rainy season to ensure that project construction discharges will not adversely affect the receiving water. Further, in areas not subject to mass grading, the smallest site disturbance area possible will be delineated and flagged; temporary storage of construction equipment will be restricted in these areas to minimize soil compaction on site.

Response 13

The Landmark Village project will reduce or prevent erosion and sediment transport and transport of other potential pollutants from the project site during the construction phase through implementation of BMPs meeting BAT/BCT in order to prevent or minimize environmental impacts and to ensure that discharges during the project construction phase will not cause or contribute to any exceedence of water quality standards in the receiving waters. Enhanced BMPs will be deployed during wet weather to ensure that project construction discharges will not adversely affect the receiving water as summarized in **Response 7** to letter from California Regional Water Quality Control Board, Los Angeles Region, dated January 22, 2007, and in the Draft EIR.

As concluded in the Draft EIR, the comprehensive construction BMPs will assure effective control of not only sediment discharge, but also of pollutants associated with sediments, such as and not limited to nutrients, heavy metals, and certain pesticides, including legacy pesticides. In addition, compliance with the BAT/BCT standard requires that BMPs used to control construction water quality are updated over time as new water quality control technologies are developed and become available for use. Therefore, compliance with the BAT/BCT performance standard ensures mitigation of construction water quality impacts over time. Also see **Response 7** to letter from Friends of the Santa Clara River, dated January 21, 2007, and **Response 4**, above.

Response 14

The project will implement enhanced erosion and sediment control BMPs during the rainy season to ensure that project construction discharges will not cause or contribute to any exceedance of water quality standards in the receiving water. Therefore, project grading regardless of season will not have a

significant water quality impact. Also see **Response 12, above,** and **Response 7** to letter from California Regional Water Quality Control Board, dated January 22, 2007.

Response 15

The Landmark Village project will be required to implement an effective combination of erosion and sediment control BMPs to ensure that project construction discharges will not cause or contribute to excessive sediment discharges in the receiving water. The project will implement enhanced erosion and sediment control BMPs during the rainy season to ensure that project construction discharges will not cause or contribute to any exceedance of water quality standards in the receiving water. Also see **Response 12,** above, and **Response 7** to letter from California Regional Water Quality Control Board, dated January 22, 2007.

Response 16

The Landmark Village project will implement enhanced erosion and sediment control BMPs when grading hillsides during the rainy season to ensure that project construction discharges will not cause or contribute to any exceedance of water quality standards in the receiving water. Also see **Response 12, above,** and **Response 7** to letter from California Regional Water Quality Control Board, dated January 22, 2007.

Further, scientific and technical literature shows that appropriate combinations of erosion control and sediment control BMPs when properly implemented on construction sites, emphasizing erosion control as a first priority, are effective to prevent excessive sediment discharges associated with grading in the wet season. Both field and laboratory research and evaluation of drainage, sediment, and erosion control technologies shows that they are individually highly effective in controlling soil loss and sediment delivery. These conclusions were confirmed by the Caltrans Soil Stabilization of Temporary Slopes study (1999) and the Caltrans Erosion Control Pilot Study (2000).

Response 17

The Landmark Village Draft EIR, Section 4.3, Water Quality, and Appendix 4.3, analyze whether additional sources of polluted runoff may result from the project based on the results of water quality modeling and qualitative assessments that take into account water quality controls or BMPs that are considered Project Design Features (PDFs). Pursuant to CEQA, an EIR is required to analyze potential project impacts compared with the existing or baseline condition. With respect to the project, the existing condition of much of the project site is row crops and other agricultural uses, and thus it is appropriate to

compare post-development runoff water quality with runoff water quality in the existing condition to assess potential impacts of the proposed project.

Potential impacts are further assessed by evaluating compliance of the project, including PDFs, with applicable regulatory requirements of the MS4 Permit, including SUSMP requirements, the Construction Permit, and the General Dewatering Permit. Further, when post-development increases in pollutant loads and concentrations are predicted, these pollutant loads and concentrations are further evaluated by comparing the magnitude of the increase to relevant benchmark receiving water quality standards, including those established by TMDLs and receiving water quality objectives and criteria from the Basin Plan and CTR. Comparison of post-development water quality concentrations in the runoff discharge with benchmark TMDL waste load or load allocations for MS4 discharges establishes the likelihood that runoff would result in exceedances in receiving water quality standards or would otherwise degrade receiving water quality, including any applicable beneficial uses. Comparison of post-development water quality concentrations in the runoff discharge with benchmark numeric and narrative receiving water quality criteria as provided in TMDLs, the Basin Plan and the CTR facilitates analysis of the potential for project runoff to result in exceedances of receiving water quality standards, adversely affect beneficial uses, or otherwise degrade receiving waters. As concluded in the Landmark Village Draft EIR, Section 4.3, Water Quality, the project will have no significant impacts on water quality.

Response 18

Agreed, the project will be required to comply with all existing, applicable implementation measures and waste load allocations of adopted TMDLs. The Landmark Village Draft EIR, Section 4.3, Water Quality, and Appendix 4.3, identify the 303(d) listings for the Santa Clara River at, and downstream of the project location and summarize the adopted TMDLs. As discussed in **Response 17,** above, post-development pollutants of concern were chosen for analysis taking existing TMDLs into account, and project-related water quality impacts were evaluated by assessing project-related water quality for those TMDL-related pollutants of concern. This impacts analysis included comparison of predicted post-development concentrations of TMDL-derived pollutants of concern to relevant benchmarks, including receiving water TMDLs and receiving water quality objectives and criteria from the Basin Plan and CTR.

Response 19

As indicated in the Landmark Village Draft EIR, Section 4.3, Water Quality, the modeled concentrations in runoff from developed areas with PDFs are below all benchmark water quality objectives and criteria and TMDL waste load allocations for the Santa Clara River and are addressed by a comprehensive site design, source control, and treatment control strategy, and compliance with SUSMP, Construction

General Permit, and General De-Watering Permit requirements. None of the qualitatively assessed constituents are expected to significantly impact the quality of receiving waters, including applicable beneficial uses, due to the implementation of a comprehensive site design, source control, and treatment control strategy in compliance with the applicable MS4 Permit requirements, Construction General Permit, and General De-Watering Permit requirements. Numerous treatment control measures will be employed as part of the project, including vegetated swales, bioretention areas and the extended detention basin. All of these PDFs will provide both treatment and infiltration functions. Therefore, potential impacts from the project on receiving water quality, including those water bodies listed as impaired pursuant to CWA §303(d), are not significant.

Response 20

The impact of lawn care practices is accounted for in the water quality model, as it estimates the concentration of pollutants in runoff based on representative data collected in Los Angeles County for runoff pollutant concentrations from various land uses that include lawn care practices. The predicted nutrient levels discussed in Section 4.3 of the Landmark Village Draft EIR (see e.g., Tables 4.3-19 and 4.3-20) are for stormwater discharges from the project to the Santa Clara River. The in-stream nutrient levels will be predominately a function of the upstream watershed, as the Newhall Ranch Specific Plan area comprises 2.9 percent of upper watershed and 1.1 percent of the 1,618-square-mile total watershed area. Average annual concentration of ammonia is predicted to be considerably less than the WLA for Santa Clara River Reach 5 and the Basin Plan objective and within the low end of the range of observed concentrations in the Santa Clara River. The average annual stormwater concentrations of nitrate-N plus nitrite-N is predicted to be considerably less than the TMDL WLA or the Basin Plan water quality objective and below the range of observed concentrations for Reach 5 of the Santa Clara River.

There are no numeric objectives for total nitrogen in the Los Angeles Basin Plan. A narrative objective for biostimulatory substances in the Los Angeles Basin Plan states: "waters shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growth causes nuisance or adversely affects beneficial uses." The low predicted total nitrogen concentrations in project stormwater discharges will not promote (i.e., increase) aquatic growth and therefore comply with the narrative objective for biostimulatory substances in the Los Angeles County Basin Plan. As shown in Tables 4.3-17 and 4.3-21 of the Landmark Village Draft EIR, the predicted total phosphorous and total nitrogen concentrations are within the low end of the range of observed concentrations in Santa Clara River Reach 5 and, thus, are not predicted to have a significant impact on water quality.

Response 21

Long-term operation and maintenance of the stormwater treatment BMPs is discussed in the Landmark Village Draft EIR, Section 4.3, Table 4.3-12, and in Appendix 4.3, the *Landmark Village Water Quality Technical Report*. The Homeowners' associations or commercial property owners' associations will be responsible for operation and maintenance of site-based BMPs (such as bioretention facilities placed in common area landscaping within multi-family residential areas and commercial areas). The LACDPW will be responsible for maintenance of village-level and sub-regional BMPs (vegetated swales and extended detention basins). This approach is consistent with the Construction General Permit and the MS4 Permit. The obligation of homeowners' and commercial property owners' Associations to operate and maintain BMPs will be created by a legally binding instrument—Covenants, Codes and Restrictions (CC&Rs) recorded on the property.

Response 22

The project proposes to avoid and minimize physical alteration of the primary drainages within or adjacent to the project site: Castaic Creek, Chiquito Canyon, San Martinez Grande Canyon, and Long Canyon. Further, Landmark Village tract map area drains directly to the Santa Clara River in both the existing condition and the proposed post-development condition, not to any of the four drainages within or adjacent to the project site: Castaic Creek, Chiquito Canyon, San Martinez Grande Canyon, and Long Canyon. As indicated in the Landmark Village Draft EIR, Section 4.2, Hydrology, off-site project-related components would not result in any significant changes in drainage or hydrology characteristics of these four drainages. Therefore, there will be no adverse impacts on the hydrologic condition or aquatic habitat within these drainages.

Response 23

Wastewater generated by the Landmark Village project will be treated in the Newhall Ranch Water Reclamation Plant (WRP). The potential water quality impacts associated with the discharge of tertiary treated reclaimed water to the Santa Clara River were previously analyzed at the project-level in the certified Newhall Ranch Specific Plan EIR. The conclusions from these documents and further analysis of the WRP discharges are summarized in **Response 2** to letter from California Regional Water Quality Control Board, dated January 22, 2007.

With respect to stormwater discharges, the Draft EIR concludes that direct and cumulative water quality impacts with respect to nutrients area not expected to adversely affect receiving waters. MS4 Permit, Construction General Permit, Dewatering General Permit, and SUSMP-compliant BMPs will be incorporated into the project to address nutrients in both the construction phase and post-development.

Nitrate-nitrogen plus nitrite-nitrogen concentrations and loads are predicted to decrease in the post-developed condition. Total phosphorous concentration is predicted to decrease in post-development conditions and to be below the minimum observed value in the Santa Clara River. Nitrate-N plus nitrite-N and ammonia-N concentrations are predicted to decrease with development to a point well below Los Angeles Basin Plan objectives and below or in the low range of observed values in the Santa Clara River Reach 5. The predicted nutrient concentrations are not expected to cause increased algae growth.

Post-development pathogen sources include both natural and anthropogenic sources. The natural sources include bird and mammal excrement. Anthropogenic sources include leaking septic and sewer systems and pet wastes. A reduction in agriculture and open space within the project area will reduce the bacteria produced by wildlife. The project will not include septic systems, and the sewer system will be designed to current standards which minimizes the potential for leaks. Thus, pet wastes are the primary source of concern. The PDFs will include source controls and treatment controls that, in combination, should help to reduce pathogen indicator levels in post-construction stormwater runoff. Pathogens are not expected to occur at elevated levels during the construction-phase of the project. On this basis, the project's impact on pathogen and pathogen indicators is considered less than significant.

Based on the Landmark Village Draft EIR analysis, stormwater discharges are sufficiently controlled via BMPs and other project design features and pollutant controls, and will not significantly impact receiving water quality with respect to nutrients or bacteria alone or in combination.

Response 24

As described in the Draft EIR, Section 1.0, the sewer and water lines will be placed within the Landmark Village tract map site, along the right-of-way for SR-126 and other major roadways, and will extend through the 110-acre utility corridor that runs parallel to SR–126, from the western boundary of the tract map site to the approved Newhall Ranch Water Reclamation Plant near the Ventura County line, from the eastern boundary of the tract map site to the Old Road and then south to the Los Angeles County Sanitation District 32 Water Reclamation Plant. The utilities within the corridor will be placed underground and a maintenance access road and trail will be constructed above ground. Potential impacts of the utility corridor on aquatic and riparian resources are assessed in the Draft EIR, Section 4.4, Biota, and mitigation measures have been adopted to address impacts to certain aquatic and riparian resources.

The water quality impacts associated with the discharge of tertiary treated reclaimed water to the Santa Clara River were previously analyzed at the project-level within the previously certified Newhall Ranch

Specific Plan Program EIR. See **Response 2** to letter from California Regional Water Quality Control Board, dated January 22, 2007.

Response 25

The New Zealand mudsnail has not been observed within the Newhall Ranch Specific Plan area and no known occurrences have been recorded within the Specific Plan area. The nearest known occurrence is within Piru Creek, approximately 14.1 miles upstream of the confluence of Piru Creek and the Santa Clara River. The confluence is located 4.8 miles downstream of the Specific Plan boundary.[17] Because the mudsnail is not found in the Specific Plan area, which includes the Landmark Village site, there is no need to complete a Hazard Analysis Critical Control Point (HACCP) plan to prevent the spread of the mudsnail, which is located off site.

Response 26

See **Responses 5** and **9** to letter from California Regional Water Quality Control Board, Los Angeles Region, dated January 22, 2007; **Responses 15** and **19** to letter from County of Ventura, Resource Management Agency, dated January 19, 2007. A series of progressive hydromodification control measures will be incorporated into the project to prevent and control hydromodification impacts to the Santa Clara River pursuant to the recommendations for the SCCWRP Study:

- Avoid, to the extent possible, the need to mitigate for hydromodification impacts by preserving natural hydrologic conditions and protecting sensitive hydrologic features, sediment sources, and sensitive habitats.
- Minimize the effects of development through site design practices (e.g., reducing connected impervious surfaces), implementation of stormwater volume-reducing BMPs (project-based hydrologic source control), and incorporation of flow duration control into water quality treatment basins, as needed.
- Mitigate hydromodification impacts using geomorphically based channel design.

LID/site design BMPs, combined with on-site volume reduction BMPs together avoid and minimize the need for physical alterations to the Santa Clara River and major tributaries. Bank protection and channel stabilization measures are limited to confined areas of the banks as discussed in **Responses 5** and **9** to letter from California Regional Water Quality Control Board, Los Angeles Region, dated January 22, 2007; **Responses 15** and **19** to letter from County of Ventura, Resource Management Agency, dated January 19, 2007. Most of the proposed bank protection would consist of buried soil cement to provide scour and freeboard flood control protection. Soil cement is a modern flood control technique used to protect

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17 Montana State University website. http://www.esg.montana.edu/aim/mollusca/nzms/. Accessed July 3, 2007.

against erosion while maintaining natural vegetation, soft banks, and related natural functions. Soil cement will be buried below the existing banks of the Santa Clara River. Disturbed areas will then re-vegetated with native plant species, maintaining the natural habitat presently found along the River. Thus, there will not be any traditional "hard armoring" of the Santa Clara River as the disturbed areas will be revegetated.

Turf Reinforcement Mat (TRM) or similar bank stability protection would be provided along the southern edge of the utility corridor downstream (west) of the tract map site. TRMs are designed to reinforce vegetation at the root and stem allowing vegetation to be used as erosion control in areas where flow conditions exceed the ability of natural vegetation to remain rooted. This includes applications with high slopes or stream banks where grouted rip-rap and concrete channels are aesthetically undesirable.

As described in Appendix B of the Draft EIR, Appendix 4.3, the *Landmark Village Water Quality Technical Report*, a statistical modeling approach was used to estimate the average annual volume of stormwater, the concentration of pollutants in stormwater, and the overall pollutant load (total mass of pollutants) in stormwater runoff. This Monte-Carlo model did not base runoff volume increases or associated changes in pollutant loads or concentrations on bulked and burned flow calculations. Instead, the model relies on a statistical description of stormwater runoff volumes, and calculated pollutant loads based on changes in average annual runoff volumes calculated in a manner that takes into account historic rainfall records, and variability of the water quality parameters for stormwater. It does not forecast runoff characteristics or regulatory compliance for specific storms or monitoring periods. The statistical model is based on relatively simple expressions describing rainfall/runoff relationships and estimated pollutant concentrations in stormwater runoff. The water quality model uses a linear equation to estimate a runoff coefficient for sub-basins as a function of the percent of imperviousness. The runoff coefficient equation parameters (coefficient and intercept) were estimated with the U.S. EPA Storm Water Management Model (SWMM) model in an effort to more accurately reflect the Landmark Village project site conditions. In accordance with LACDPW requirements, the burned and bulked storm event (the capital storm) was used to calculate capital flood runoff quantities for the project's drainage areas, as described in Section 4.2.

Response 27

Please see **Responses 5** and **9** to letter from California Regional Water Quality Control Board, Los Angeles Region, dated January 22, 2007; **Responses 15** and **19** to letter from County of Ventura, Resource Management Agency, dated January 19, 2007.

Response 28

In the Landmark Village Draft EIR, Section 4.3, Water Quality, Balance Hydrologics assessed the potential effects of the planned cumulative urbanization within the Santa Clara River area, upstream of the County line (the upper watershed) on channel morphology by examining historical changes in the Santa Clara River channel pattern in response to different types of major disturbance using historical rainfall and other relevant records and aerial channel photography (Balance Hydrologics, 2005 [provided in Appendix 4.3]). These findings are summarized below.

The Santa Clara River is a dynamic, episodic system. Understanding the magnitude of geomorphic change over the course of recent history in response to natural and human disturbances in the watershed is a key factor in assessing the potential response to future urbanization, including development of Landmark Village, within the watershed.

Major perturbations within the Santa Clara River watershed (dam construction, levee construction, changes in flows in response to decadal-scale climatic patterns, and increase in woody vegetation) do not appear to have had a significant impact on the geomorphic expression of the Santa Clara River, as quantified from measurements made from a series of historical aerial photographs flown during the years 1927 through 2005.

Additional study of the Santa Clara River has been performed by Pacific Advanced Civil Engineering, Inc., which prepared a comprehensive fluvial analysis of the Santa Clara River through the NRSP area for the LACDPW. This analysis is included within Section 4.2 of the Landmark Village Draft EIR. A river fluvial analysis is the study of the riverbed and bank sediment movement over time and as a result of flow in the river and changes in the tributary watershed.

The fluvial analysis had three distinct components:

> Analysis of long-term trends of riverbed and bank sediment build-up (aggredation) or removal (degradation) was performed. More than 80 years of available historic topographic mapping of the river indicated no real trend of aggredation or degradation in the study reach.
>
> General (capital storm event) aggredation/degradation calculations were performed to determine the expected fluvial response of the river to the LACDPW design storm event (>140,000 cfs). US Army Corps of Engineers computer modeling software (SAM) was used to evaluate existing and proposed project conditions. Only minor variations in the fluvial response were shown in the modeling.

> Local aggredation/degradation resulting from river curvature, bridges, river bed material, and various other components were considered and estimates of aggredation and degradation were calculated.

To complete the fluvial analysis, long term, general, and local aggredation/degradation components were added together to obtain the total aggredation/degradation for each river section within the study reach.

One of the purposes for the fluvial analysis, which has been approved by LACDPW, was to provide a level of understanding of the Santa Clara River reach fluvial mechanics related to existing conditions and proposed NRSP development conditions, including increased volume of runoff and proposed bank stabilization, bridges and other physical alterations to the Santa Clara River, to identify any potential project impacts to the fluvial mechanics of the river. The fluvial analysis showed very little change in the pre- and post-development conditions and therefore concluded that there is no potential adverse impact to the fluvial mechanics of the river.

Response 29

Please see **Responses 5** and **9** to letter from California Regional Water Quality Control Board, Los Angeles Region, dated January 22, 2007; **Responses 15** and **19** to letter from County of Ventura, Resource Management Agency, dated January 19, 2007; and **Response 26** to letter from Friends of the Santa Clara River, dated January 21, 2007.

Response 30

Presently, LACDPW requires buried bank stabilization (soil cement), concrete, or rip-rap for bank protection. Moreover, average velocity and stream power values during the largest storms (>20 fps, >75 lb/ft-s during the 100-year discharge) exceed values appropriate to mat-type bio engineering *in lieu* of hardened stabilization. Habitat restoration will occur on top of and adjacent to the buried bank protection. This habitat restoration also will serve as bioengineering to retain soil on top of the soil cement bank protection.

Response 31

As noted in **Response 30**, restoration will occur on top of the soil cement bank protection. This restoration will take a form similar to **Figure D-1** in **Response 4** to letter **D12** from Friends of the Santa Clara River, dated January 21, 2007, and will provide habitat and water quality in a manner similar to that of existing conditions. Soil cement has been used for flood protection purposes for several years. There is no documentation on record at the County of soil cement failing. The Newhall Ranch River Fluvial Final Report, Phase I, confirms that the bank stabilization, for the most part, is set back from the

River corridor, which allows the River to maintain its key hydraulic characteristics and overall mosaic of habitats in the River.

Response 32

The vertical columns as designed do not impact wildlife migration. The Landmark Village Draft EIR, Section 4.5, Floodplain Modification, p. 4.5-1, summarizes the project impacts as follows: "The hydraulic impacts on sensitive aquatic/riparian resources in the Santa Clara River corridor due to floodplain modifications associated with construction and operation of the proposed Landmark Village project site would be localized, and not cause significant hydrological impacts adjacent to or downstream from the Landmark Village site. On that basis, and given the limited amount of riparian habitat permanently altered by Landmark Village site development, project construction and operation would not significantly impact the unarmored threespine stickleback (*Gasterosteus aculeatus williamsoni*), arroyo toad (*Bufo californicus*), California red-legged frog (*Rana aurora draytonii*), southwestern pond turtle (*Clemmys marmorata pallida*), or two-striped garter snake (*Thamnophis hammondii*)." From a long-term cumulative perspective, the Landmark Village Draft EIR found that:

> "In this case, cumulative impacts on the hydrology and hydraulics of the Santa Clara River associated with development of the entire Newhall Ranch Specific Plan were fully evaluated in Section 2.3 (Floodplain Modifications) of the Newhall Ranch Revised Additional Analysis (May 2003). Consequently, this Draft EIR incorporates by reference the floodplain modification analysis and conclusions from the certified Revised Additional Analysis (May 2003).
>
> That analysis concluded that the reduction in floodplain area caused by bank protection would not create a significant increase in overall velocities or water depth, because the volume of flow carried in these shallow, slow-moving areas along the margins of the river is small. Moreover, variations are localized and limited in scope, especially when viewed in the entirety of the river corridor within the Specific Plan site and downstream. Therefore, the overall mosaic of habitats in the river would be maintained because the key hydraulic characteristics would not be significantly different under the Specific Plan. Based on these results, the Board of Supervisors found that the proposed bank protection and bridges associated with the Specific Plan would not cause significant changes to key hydraulic characteristics, and, therefore, would not alter the amount and pattern of aquatic, wetland, and riparian habitats in the river at the Specific Plan site and downstream in Ventura County." Landmark Village Draft EIR, Section 4.5, Floodplain Modification, pp. 4.5-71 through 4.5-72.

Additionally, Mitigation Measure LV 4.4-6 states that "[i]nstallation of bridges, culverts or other structures shall not impair movement of fish and aquatic life. Bottoms of temporary culverts shall be placed at or below channel grade. Bottoms of permanent culverts shall be placed below channel grade."

Response 33

Please see **Response 32**, above. Additionally, the Landmark Village Draft EIR, Section 4.4, Biota, acknowledges that impacts from human presence would remain a significant and unavoidable impact after mitigation.

Response 34

Please see **Response 32**, above. Impacts to riparian habitat would not be impacted by bank stabilization or hardscape features of the project. Consequently, a light-penetrating surface from the bridge is not required or necessary. In addition, the comment does not provide any data supporting the need for a light-penetrating surface on the bridge.

Response 35

Water quality (Draft EIR, Section 4.3, Water Quality), species, and habitat (Section 4.4, Biota; Section 4.5, Floodplain Modifications) impacts associated with the project are analyzed in the Landmark Village Draft EIR. As discussed above and in Section 4.3, the potential water quality impacts of project discharges to the Santa Clara River were considered for more than 30 different pollutants, and were analyzed, both qualitatively and quantitatively, for all phases of project development and for more than 15 pollutants of concern, including sediment, chloride, nitrogen and nutrients, metals, and pesticides. In Sections 4.2, Hydrology, and 4.3, Water Quality, the Draft EIR also analyzes the potential hydromodification impacts associated with the project, addressing both impacts associated with changes in flow from, and hydrologic conditions within the project site, and those related to proposed physical alterations to the river channel. This analysis considers both the affects of hydromodification on channel stability, and the affects of hydromodification on biota within the Santa Clara River, and provides specific description and assessment of project design features and mitigation measures are incorporated to address those impacts. Further, the conclusions in the Landmark Village Draft EIR are consistent with, and builds upon, the previously certified Newhall Ranch Specific Plan Program EIR. Finally, the project avoids and minimizes physical alterations to the Santa Clara River, and does not propose "armoring" of the River.

Response 36

Available scientific literature and studies regarding the relationship between the proportion of effective impervious surface within watersheds and resulting impacts on channel stability were summarized in the Landmark Village Draft EIR, Section 4.3, Water Quality (including the WQTR in Appendix 4.3), and provided for the basis of assessing project hydromodification impacts associated with increases in volume and duration of flow associated with the construction of project-related impervious surfaces. At

the outset, it should be understood that the studies that have related imperviousness to stream stability have been conducted in watersheds that did not include hydromodification control facilities, or may have included flood control facilities or minimal treatment control BMPs that were not designed to encourage volume reduction. In such watersheds, significant declines in the biological integrity and physical habitat of streams and other receiving waters have been found to occur with as little as 3–10 percent of uncontrolled imperviousness. Furthermore, the watersheds referenced in these studies are much smaller than the Santa Clara River watershed.

There is much discussion in the scientific literature about the reliability of imperviousness as a "predictor" of potential impacts from new development. In fact, the effects of imperviousness on hydromodification impacts are much more complicated than a simple correlation with total imperviousness. The limited hydromodification impact research to date has focused on empirical evidence of channel failures in relationship to directly connected impervious area (DCIA) or total impervious area. However, more recent research has established the importance of size of watershed, channel slope and materials, vegetation types, climatic and precipitation patterns, and degree of DCIA versus disconnected impervious area (SCCWRP 2005a, Balance Hydrologics, 2005). Impervious area that drains directly to a storm drain system and then to the receiving water is considered "directly connected," whereas impervious area that drains through vegetation prior to surface waters or to infiltration facilities is considered "disconnected."

Although physical degradation of stream channels in semi-arid climates of California may occur when watershed total imperviousness is between three and five percent, not all streams will respond in the same manner (SCCWRP, 2005b). Management strategies need to account for differences in stream type, stage of channel adjustment, current and expected amount of basin imperviousness, and existing or planned hydromodification control strategies. The absolute measure of watershed imperviousness that could cause stream instability depends on many factors, including watershed area, topography, land cover, and soil type; development impervious area and connectedness; longitudinal slope of the river; channel geometry; and local boundary materials, such as bed and bank material properties and vegetation characteristics and degree to which impervious surface is directly connected to channels susceptible to erosion within the watershed.

In summary, per Schueler's *Cautionary Note* (Schuler and Holland, 2000), while the research on impervious cover and stream quality is compelling, it is doubtful whether is can serve as the sole foundation for technically defensible management actions at this time. Key reasons include: (1) the research has not been standardized, so different investigators have used different methods to define and measure/estimate imperviousness; (2) researchers have employed a wide number of techniques to measure stream quality characteristics that are not always comparable to each other; (3) most of the

studies have been confined to a few ecoregions, and few studies have been conducted in Southern California; (4) the absolute measure of watershed imperviousness that could cause stream instability depends on many factors, including watershed area, land cover, vegetative cover, topography, and soil type; development impervious area and connectedness; longitudinal slope of the river; channel geometry; and local boundary materials, such as bed and bank material properties and vegetation characteristics; and (5) none of the studies has yet examined the effect of widespread application of stormwater treatment, LID controls and/or hydromodification control practices on impervious cover/stream quality relationships.

The project incorporates LID/site design BMPs, as well as volume reduction BMPs. See **Responses 5** and **9** to letter from California Regional Water Quality Control Board, Los Angeles Region, dated January 22, 2007; and **Responses 15** and **19** to letter from County of Ventura, Resource Management Agency, dated January 19, 2007. For example, the NRSP clusters development into villages, including Landmark Village. A minimum of 70 percent (8,335 acres) of the NRSP subregion will remain undeveloped (i.e., open space, river corridor, manufactured slopes, and other open areas within the Newhall Ranch Specific Plan). Approximately 55 acres of the approximately 290-acre Landmark Village Tract Map site will remain as open space or parks. An additional 40 percent of the tract map site will be open areas dedicated to landscaping and recreation. All of the developed areas of the project will drain to vegetated site design and/or treatment control BMPs, prior to discharge, and therefore all of the project areas will be "disconnected", and thus will not result in the "uncontrolled imperviousness" that is the subject of the cited study. In addition, two studies of the geomorphically relevant characteristics of the River have been conducted, one by Balance Hydrologics and one by PACE, to assess the impact of project induces changes in flow on the River's stability and aquatic habitats and species. These studies conclude that project design features are sufficient to prevent both direct and cumulative hydromodification impacts to the Santa Clara River.

Response 37

Schueler (1995) is commenting on flood control detention basins, not water quality control basins designed to standards set forth in the Landmark WQTR (Appendix 4.3). An analysis of the monitored inflow and outflow data contained in the International Stormwater BMP Database found that dry detention basins reduced runoff volumes by an average of 30 percent (comparison of inflow to outflow), while biofilters reduced volumes by almost 40 percent (Strecker, E. et al., 2004). Based on this analysis, a conservative estimate of 25 percent of the project's inflow to the vegetated swales and bioretention areas was assumed to infiltrate and/or evapotranspire in the water quality model. The extended detention basin was assumed to remove 20 percent of volume through evapotranspiration and infiltration. Site design BMPs, such as bioretention areas, implemented within the project's commercial and multi-family

land use areas will further reduce runoff volumes, but these reductions were not calculated quantitatively. In summary, the project BMPs will result in the project not having significant hydromodification impacts.

Response 38

The percent imperviousness values listed in Table 4.2-1 are those contained in the Los Angeles County Hydrology Manual and are appropriate values for estimating impervious cover associated various land uses proposed for development.

The Landmark Village tract map site is located in the first phase of the Riverwood Village within the boundary of the approved Newhall Ranch Specific Plan. The Specific Plan will guide the long-term development of the 11,963-acre Newhall Ranch community, comprising a broad range of residential, mixed-use, and non-residential land uses within five village areas. The Specific Plan contains the approved land use plan, development regulations, design guidelines, and corresponding implementation program, which would create a mixed-use community consistent with the goals, policies, and objectives of the Los Angeles County General Plan and Santa Clarita Valley Areawide Plan. The Specific Plan is regulatory in nature and serves as the zoning for Newhall Ranch.[18] Subsequent development plans and tentative subdivision maps must be consistent with the adopted General Plan, Areawide Plan, and Specific Plan.

The project incorporates LID/site design BMPs, as well as volume reduction BMPs. See **Responses 5** and **9** to letter from California Regional Water Quality Control Board, Los Angeles Region, dated January 22, 2007; and **Responses 15** and **19** to letter from County of Ventura, Resource Management Agency, dated January 19, 2007. For example, the Specific Plan clusters development into villages, including Landmark Village. Approximately 70 percent (8,335 acres) of the Specific Plan subregion will remain undeveloped (i.e., open space, river corridor, manufactured slopes, and other open areas within the Newhall Ranch Specific Plan). Approximately 55 acres of the 290-acre Landmark Village project area will remain as open space or parks. An additional 40 percent of the tract map site will be dedicated to landscaping and recreation. All of the developed areas of the project will drain to vegetated site design and/or treatment control BMPs, prior to discharge, and, therefore, all of the project areas will be "disconnected. In addition, two studies of the geomorphically relevant characteristics of the River have been conducted, one by Balance Hydrologics and one by PACE, to assess the impact of project induces changes in flow on

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18 The Specific Plan was prepared pursuant to the provisions of the California Planning and Zoning Law, Title 7, Division 1, Chapter 3, Article 8, Government Code Sections 65450-65457. This law authorizes local jurisdictions, like the County, to adopt a Specific Plan by resolution. On May 27, 2003, the County's Board of Supervisors adopted a Resolution approving General Plan Amendments, Sub-Plan Amendments, and the Newhall Ranch Specific Plan.

the River's stability and aquatic habitats and species. These studies conclude that project design features are sufficient to prevent both direct and cumulative hydromodification impacts to the Santa Clara River. To replace this site specific analysis and development of hydromodification control techniques with measures such as the one suggested would be contrary to Schueler's *Cautionary Note* (Schuler and Holland, 2000), improperly applying a "one-size-fits all" limitation on percentage of impervious cover without considering appropriate characteristics of the specific project, project site, existing hydrology, receiving water channel, and climatic region and then designing adequate controls based on those characteristics.

Response 39

It is correct that creation of impervious surfaces associated with project development would increase the amount of clear flow runoff from the site. However, burned and bulked runoff and debris volumes would be reduced due to development of the site and installation of debris basins. The calculations referenced in the comment are solely related to the flood control analysis as required by Los Angeles County, and were not used to evaluate project water quality or hydromodification impacts. As indicated in the Landmark Village Draft EIR, the project does not result in any significant water quality impacts.

Response 40

Burned and bulked calculations were not used in water quality modeling. As described in Appendix B of the Draft EIR, Appendix 4.3, the *Landmark Village Water Quality Technical Report*, a statistical modeling approach was used to estimate the average annual volume of stormwater, the concentration of pollutants in stormwater, and the overall pollutant load (total mass of pollutants) in stormwater runoff. This Monte-Carlo model did not base runoff volume increases or associated changes in pollutant loads or concentrations on bulked and burned flow calculations. Instead, the model relies on a statistical description of stormwater runoff volumes, and calculated pollutant loads based on changes in average annual runoff volumes calculated in a manner that takes into account historic rainfall records, and variability of the water quality parameters for stormwater. It does not forecast runoff characteristics or regulatory compliance for specific storms or monitoring periods. The statistical model is based on relatively simple expressions describing rainfall/runoff relationships and estimated pollutant concentrations in stormwater runoff. The water quality model uses a linear equation to estimate a runoff coefficient for sub-basins as a function of the percent imperviousness. The runoff coefficient equation parameters (coefficient and intercept) were estimated with the U.S. EPA Storm Water Management Model (SWMM) model in an effort to more accurately reflect the Landmark Village project site conditions. In accordance with LACDPW requirements, the burned and bulked storm event (the capital

storm) was used to calculate capital flood runoff quantities for the project's drainage areas, as described in the Landmark Village Draft EIR, Section 4.2, Hydrology.

Response 41

The Landmark Village Draft EIR analyzed stormwater flow, loadings, and concentrations in non-bulk and burned conditions. See **Response 40**, above.

Response 42

The comment expresses a concern that the project encroaches into the existing FEMA 100-year floodplain, which "impinges" upon the natural functioning of the River to such an extent that significant, unmitigable damage will occur to water quality and aquatic habitat. The Draft EIR, Section 4.5, Floodplain Modifications, at pp. 4.5-70 through 4.5-71, summarized the impacts to the River and aquatic habitat as follows:

> "The proposed project would place bank stabilization along selected portions of the river, developing areas behind the bank stabilization, and installing a bridge across the river. These actions would alter flows in the river; however, the effects would only be observed during infrequent flood events that reach the buried bank stabilization. The proposed project would cause an increase in flows, water velocities, and water depth. However, these hydraulic effects would be minor in magnitude and extent. These effects would be insufficient to alter the amount, location, and nature of aquatic and riparian habitats in the project area and downstream. Under the project, the river would still retain sufficient width to allow natural fluvial processes to continue. Hence, the mosaic of habitats in the river that support various sensitive species would be maintained, and the populations of the species within and adjacent to the river corridor would not be significantly impacted.
>
> These findings apply with equal force to other aquatic species dependent upon riparian habitat in the River Corridor SMA/SEA 23 that were not targeted for study in this section. Species such as the Arroyo Chub and Santa Ana sucker, which are expected to occur in the portion of the river adjacent to the project site, have both life history requirements and habitat preferences that are dependent upon aquatic habitat. As described above, the project improvements would not result in significant changes to flow, water velocities, or depth of the river, so the mosaic of habitats that support such aquatic species would be maintained."

In addition, based on the floodplain analysis contained in the Draft EIR, Section 4.5, Floodplain Modifications, at p. 4.5-72, it was found that the proposed project would not result in any significant unavoidable project or cumulative impacts to sensitive biological resources due to bank stabilization, bridge crossings, or changes in the floodplain due to project development.

The comment also claims that there is an insufficient "buffer" to the Santa Clara River. The information presented below is responsive to this comment.

Habitat buffers along the Santa Clara River were analyzed in the Landmark Village Draft EIR, Section 4.4.9, pp. 4.4-60 through 4.4-61. See also, the revised **Section 4.4, Biota**, found in this Final EIR. This section cites the Impact Sciences (1997) study that conducted vegetation analyses, focused bird surveys (1,100 field hours), and small mammal trapping (1,200 trap nights) along the Santa Clara River and adjacent uplands.[19]

The Buffer Study collected data for plant species composition, canopy height, shrub/tree density, percent cover and other species-specific criteria in order to define high-quality versus low-quality upland habitat for wildlife use and diversity. The focused wildlife studies concentrated on riparian bird and small mammal use of high- and low-quality upland habitat and upland/riparian ecotone and utilized systematic survey methods, including time-area observations, belt-transect counts at different distances parallel to the Santa Clara River, small mammal trapping, scent stations, and remote cameras. The Buffer Study thus helped identify the special-status populations at risk and their habitat use patterns along the River corridor. For example, at the western study site about 63 percent of riparian-dependent birds were observed in riparian habitat, 14 percent were in edge habitat, 18 percent were in upland habitat (primarily dense big sagebrush scrub and coastal sage scrub at this site) within 50 feet of the riparian edge, 5 percent were in upland habitat between 50 and 100 feet of the riparian edge, and 1 percent (one observation) were in upland habitat between 100 and 150 feet from the riparian edge. No riparian-dependent birds were observed beyond 150 feet from the riparian edge. Combined 94 percent of the riparian-dependent bird observations were within 50 feet of the riparian edge (including the riparian habitat) and 99 percent were within 100 feet. The Buffer Study also cited studies of least Bell's vireo in San Diego and Santa Barbara counties with findings that where the riparian corridor is relatively wide (>100 feet) vireos only foraged within 100 feet of the riparian edge and where the riparian corridor is more narrow (<100 feet) vireos ranged up to 300 feet from the riparian edge. The Buffer Study suggests that riparian buffers along the Santa Clara River should range from a minimum of 100 to 150 feet in width, depending on the quality of the upland habitat (a larger buffer width required if the upland habitat is of low quality). Thus, habitat enhancement in areas where the buffer is narrower could compensate for the smaller buffer. In addition, the Buffer Study recommended a wall at the edge of development to attenuate noise and lighting, and to discourage human intrusion.

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[19] Please see **Appendix A** of this Final EIR for the "North Valencia Annexation Buffer Study, Draft," Impact Sciences, Inc., dated April 28, 1997 (Buffer Study).

It also should be noted that a minimum 100 feet of high-quality upland habitat from the edge of riparian habitat is consistent with CDFG (Northern California-North Coast [Region 1]) buffer criteria for avoiding significant impacts to riparian species and habitats adjacent to urban development (CDFG 2001).[20] In developing the buffer criteria, CDFG stated that "[d]epartment biologists have relied on scientific research and literature and professional experience to develop the following recommendations to protect the public's fish, wildlife and native plant resources." For example, CDFG recommends a 75-foot buffer from the outside edge of the riparian habitat for the Sacramento River, a 50-foot buffer for main tributaries, and a 25-foot buffer for secondary tributaries. CDFG also stated that "[i]f development restrictions related to mandatory requirements do not allow a project to completely avoid the area of the buffer zone outside the riparian vegetation, the project proponent may average the setback distance along the riparian habitat for the length of the project." Therefore, there is some flexibility in the minimum buffer width as long as the average width criteria are met.

Before addressing buffer issues for the Landmark Village project, it is important to understand that the buffer between the Santa Clara River and development was addressed and heavily debated during the Newhall Ranch Specific Plan environmental review and approval process. Prior to final Specific Plan approval, the County Board of Supervisors required that the Specific Plan design be revised to incorporate a 100-foot-wide setback (top of bank stabilization to residential, commercial, mixed use development) to protect riparian habitat and special-status species within the River Corridor SMA/SEA 23 boundaries. This setback is in addition to an average buffer width of 100 feet from the top of bank stabilization to existing riparian resources. This finding was arrived at after evaluating the potential impacts of the proposed land uses along the entire length of the River (consistent with the Kelly and Rotenberry recommendations), coupled with the existing habitat protection and enhancement provisions contained in the Specific Plan's Resource Management Plan and Design Guidelines. The overall buffer area is comprised of several components: (1) the Salt Creek wildlife corridor connection and the High Country half-mile-wide buffer at the westerly end of the Specific Plan on the south side of the River; (2) native upland habitats in the Open Area along the south side of the River; (3) disturbed areas in the River corridor that will be restored or enhanced as riparian habitat; (4) buried bank stabilization that will be revegetated with native riparian and upland plant species; and (5) landscaped open space areas such as community parks, the Regional River Trail, and community trails.

In approving the Specific Plan and Conditional Use Permit No. 94-087-(5), the Board of Supervisors found that the Specific Plan contained sufficient natural vegetative cover and open space to buffer critical resources in the River Corridor SMA/SEA 23 from the development shown in the Specific Plan. The

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[20] Please see **Appendix A** of this Final EIR for the CDFG (Northern California-North Coast, Region 1) buffer criteria.

Board of Supervisors further found that the Specific Plan incorporated extensive buffer area to protect critical resources within the Santa Clara River. The Specific Plan's adopted Resource Management Plan requires a minimum 100-foot-wide setback adjacent to the Santa Clara River between the top river-side of the bank stabilization and development within certain specified land use designations (including those of the Landmark Village project site) unless through Planning Director review, in consultation with the County staff biologist, it is determined that a lesser buffer would adequately protect the riparian resources within the River Corridor SMA/SEA 23, or that a 100-foot-wide setback is infeasible for physical infrastructure planning. Again, these buffer criteria are consistent with the Impact Sciences and CDFG recommendations described above.

This buffer analysis does not presume that indirect effects on sensitive biological resources in the river corridor will not potentially occur as a result of development. In combination with the 100-foot setback and an average 100-foot buffer, the Specific Plan's Resource Management Plan provides standards by which biological resources will be managed during construction and for the life of the community, including provisions for: (1) restoration and enhancement of disturbed areas; (2) restrictions on pedestrian and vehicular access to the river corridor; (3) design standards for transition areas between development and the river; (4) conveyance of conservation easements; and (5) preparation of a financial plan and the long-term management of the riparian resources by the Center for Natural Lands Management.

The Landmark Village project would maintain a 100-foot setback between the top of the bank and proposed residential, mixed-used, and commercial development. Based on the site-specific analysis conducted in the Draft EIR, the Landmark Village buffer is consistent with the approved Specific Plan. However, as noted above, designation of the Landmark Village average 100-foot-wide buffer and 100-foot-wide setback does not imply no potential for indirect effects. Specific to the Landmark Village project, potential long-term indirect effects are analyzed in Section 4.4 of the Draft EIR, pp. 4.4-85 through 4.4-92, including increases in: (1) pesticides, herbicides, and pollutants; (2) lighting and glare impacts on wildlife species; (3) non-native plant and wildlife species; and (4) human activity and domestic pets. The Project Design Features (PDFs) and mitigation measures to reduce these potential indirect impacts are also discussed in the Draft EIR.

PDFs to address urban runoff from irrigation and stormwater include site design, source control, treatment control, and hydromodification control Best Management Practices (BMPs). Stormwater runoff from all urban areas within the Landmark Village project will be routed to bioretention areas, vegetated

swales, and/or extended detention basin treatment controls BMPs. The effectiveness of these PDFs to maintain water quality in the Santa Clara River was analyzed by GeoSyntec Consultants.[21]

The mitigation measures to address the other listed potential indirect effects include previously incorporated measures from the Newhall Ranch Specific Plan Program EIR and additional measures recommended by EIR. Significant impacts related to buffers and edge effects and mitigation measures to reduce the level of impact include:

- Restriction of Wildlife Habitat Linkages – mitigated by previously incorporated mitigation Measure SP 4.6-18.
- Increased Light and Glare – mitigated by previously incorporated Mitigation Measure SP 4.6-56.
- Increase in Populations of Non-native Plant and Wildlife Species – mitigated by the Landmark Village EIR Mitigation Measures LV 4.4-28 and LV 4.4-31.
- Increased Human and Domestic Animal Presence Within SMA/SEA 23 – mitigated by previously incorporated Mitigation Measures SP 4.6-17 through SP 4.6-19 and Landmark EIR Mitigation Measures LV 4.4-32 through LV 4.4-34.

Response 43

Please see **Response 42**, above. In addition, it should be noted that the letter from Dr. Philip Rundel was not provided with the comment letter, nor were any of the reference materials cited in footnote 3 to the comment letter.

Response 44

Please see **Response 4**, above. In addition, as discussed in the Landmark Village Draft EIR (p. 4.4-57), the proposed project maintains a 100-foot setback between top of bank and proposed residential, mixed-used, and commercial development, and an average 100-foot buffer between top of bank and existing riparian resources. As required by Mitigation Measure LV 4.4-1 in the Final EIR (Mitigation Measure LV 4.4-7 in the Draft EIR) all riparian plant communities permanently or temporarily disturbed would be restored after completion of construction activities.

Response 45

The document does not state that the project-associated loss of wildlife habitat is "unavoidable." More correctly, and consistent with the findings of the approved Newhall Ranch Specific Plan Program EIR, the

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21 GeoSyntec Consultants. September 2006. *Landmark Village Water Quality Technical Report* (see Draft EIR, Appendix 4.3).

loss of wildlife habitat is identified as an unavoidable significant impact under CEQA. It should be noted that efforts to preserve wildlife habitat have been taken. The Newhall Ranch Specific Plan includes the preservation of large areas of open space, including the protection in perpetuity of approximately 6,700 acres of wildlife habitat and approximately 500 acres of 1,002 acres of designated Open Area within the approved Specific Plan.

Response 46

Please see **Response 4**, above.

Response 47

The fuel modification zone for structures adjacent to the Santa Clara River will extend approximately 100 feet from the structure into the setback area. Consequently, the fuel modification zone will not encroach upon the riparian corridor or the adjacent upland habitat buffer. Most of the fuel modification zone for the Landmark Village project occurs within existing agricultural areas and will not result in additional impacts to native vegetation.

Response 48

The Landmark Village Draft EIR requires the replacement of riparian/wetland plant communities consistent with the requirements of the -approved Newhall Ranch Specific Plan (see, Mitigation Measure LV 4.4-1 in the Final EIR; Mitigation Measure LV 4.4-7 in the Draft EIR). However, the proposed project would still be required to comply with conditions contained in the pending permits/agreements with the U.S. Army Corps of Engineers and the California Department of Fish and Game in connection with the related EIS/EIR project (see **Topical Response 2**: EIS/EIR Project). Such conditions may exceed those required by the approved Specific Plan and related Newhall Ranch environmental documentation.

In regards to oak tree replacement, in the preliminary planning phases of the Specific Plan, the Landmark Village project boundaries were delineated based on the project's disturbance footprint, while large areas of habitat (e.g., the River Corridor SMA/SEA 23 and the High Country SMA/SEA 20) were designated for protection and to facilitate mitigation. Therefore, the Landmark Village project is a component of the greater Newhall Ranch Specific Plan, which includes preservation of the River Corridor SMA/SEA 23 and the High Country SMA/SEA 20. These areas would protect approximately 585 acres of oak woodland and 300 acres of oak savannah in perpetuity. Preservation of the Salt Creek area also would protect approximately 266 acres of oak woodland and 113 acres of oak savannah in perpetuity. In total, 851 acres of oak woodland and 413 acres of oak savannah (including the River Corridor SMA/SEA 23, the High Country SMA/SEA 20, and the Salt Creek area) would be preserved. The preservation of this oak

woodland habitat, as well as the implementation of Mitigation Measure LV 4.4-4 in the Final EIR (Mitigation Measure LV 4.4-21 in the Draft EIR) would comply with the Specific Plan requirements, the County Oak Tree Ordinance, and the requirements of Public Resources Code section 21083.4 (oak woodlands conservation).

Response 49

Please refer to the Final EIR **Section 3.0, Revised Draft EIR Pages**, for requested revisions as to California red-legged frog. Specifically, the Final EIR has been revised to indicate that California red-legged frog has some potential to occur on the project site, and to include mitigation to avoid any loss of the species (see, **Table 4.4-6** and Mitigation Measure LV 4.4-18 in the Final EIR).

The Draft EIR (p. 4.4-79) includes an analysis of special-status wildlife species occurring downstream of the project site. As discussed, the Flood Technical Report for the Landmark Village project (PACE 2006) found that there would be no significant changes in water flows, velocities, depth, sedimentation, or floodplain and channel conditions downstream of the project site as a result of the proposed project. These hydraulic effects also were found to be insufficient to alter the amount, location, and nature of aquatic and riparian habitats in the project area and downstream into Ventura County. The technical analysis further determined that the river would still retain sufficient width to allow natural fluvial processes to continue; consequently, the mosaic of habitats in the river that support various sensitive species would be maintained and the population of the species within and immediately adjacent to the River Corridor would not be significantly affected. This analysis would also apply to any potential steelhead located downstream of the project site, west of the confluence with Piru Creek in Ventura County.

Response 50

The comment is noted. No further response is required given that the comment does not address or question the content of the Draft EIR.

Letter No. D14

Tae, Susan

From: Randi Parent [rparent@HealTheBay.org]
Sent: Wednesday, January 24, 2007 1:57 PM
To: Tae, Susan; dfierros@planninglacounty.gov

RE: Project No. 00-196 / Tract Map No. 53108 / Landmark Village, Draft EIR

Dear Ms. Tae and Mr. Fierros,

I am writing with the hope that you will be willing to look over comments regarding the landmark Village Draft EIR with fresh eyes and an open mind, and with a determination that saving the wilderness of the upper Santa Clara River is of the utmost importance. 1

There are obvious challenges -- air quality, water, traffic, and energy, which must be overcome, but the most overriding challenge of all is whether we can save the last free-flowing river in Southern California from being destroyed in one of the last truly wild areas of Los Angeles County.

This is a tremendous opportunity for all of us to save the upper Santa Clara River, its floodplain, tributaries, and upland habitat -- which links to other wild areas in the state. 2

I am not against housing development; I understand the need to provide housing for our growing population -- however -- not at the expense of this wonderful state resource.

Please reconsider the EIR and make recommendations that it be revised to include the proper studies to determine what areas are most critical to birds and wildlife. My greatest concern is that this project is being rushed through without acceptable scientific research, which has been strongly recommended by many non-profit organizations. 3

Sincerely,

Randi Parent
Community Outreach Coordinator
Santa Monica Pier Aquarium
1600 Ocean Front Walk
Santa Monica, CA 90401
310-393-6149, ext. 105

1/24/2007

D14. Letter from Santa Monica Pier Aquarium, dated January 24, 2007

Response 1

The comment expresses the opinions of Santa Monica Pier Aquarium. The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not address or question the content of the Draft EIR, no further response is required.

Response 2

The comment addresses general subject areas, which received extensive analysis in the Landmark Village Draft EIR, Section 4.3, Water Quality, Section 4.4, Biota, Section 4.5, Floodplain Modifications, Section 4.7, Traffic/Access, Section 4.10, Water Service, and Section 4.19, Utilities. The comment does not raise any specific issue regarding that analysis and, therefore, no more specific response can be provided or is required. However, the comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project.

Response 3

The comment requests that the Landmark Village Draft EIR reconsider its recommendations and be revised to include "proper studies" to determine what areas are most critical to birds and wildlife. The comment also expresses concern that the project is "rushed" without acceptable scientific research. Numerous biological surveys over the last 13 years have been properly conducted in the Newhall Ranch Specific Plan area, including the Landmark Village project site. For copies of these biological surveys/studies, please refer to the Landmark Village Draft EIR, Appendix 4.4, and in the Final EIR, **Appendix A**. In response to claims that the project has been rushed, please refer to **Topical Response 3**: Public Review Opportunities.

The remainder of the comments do not raise any specific issue regarding the analysis contained in the Draft EIR and, therefore, no more specific response can be provided or is required. However, the comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project.

Letter No. D15

TASC

TOPANGA ASSOCIATION FOR A SCENIC COMMUNITY
P.O. BOX 352 TOPANGA CALIFORNIA 90290

January 30, 2007

Mr. Hal Helsley
Vice Chair
County of Los Angeles
Dept. of Regional Planning
Hall of Records (13th Floor)
320 West Temple St.
Los Angeles, CA. 90012

RE: Project No. 00-196, Tract Map No. 53108, Landmark Village

Dear Mr. Helsley:

Topanga Association of a Scenic Community (TASC) urges the Department of Regional Planning to reject Landmark Village as proposed. 1 The sacrifice of over 3,000 acres of wildlife habitat, including coastal sage scrub and Valley Oak woodland, 2 plus the significant impact on species and dire cumulative impacts that cannot be mitigated, is too great for the benefit of additional housing. 3 At a minimum, the County must prepare a revised EIR, one based on a complete survey of the entire site: as it stands now, agricultural areas and grasslands, which is where all of the development will occur, have not been surveyed at all, while the best-surveyed area, riparian woodland, will be comparatively safe from development. 4 This limited survey stands the purpose of an EIR on its head. It also violates CEQA, which mandates consideration of the "full environmental context."

5 We understand that much housing is needed, but there is plenty of other land that can be developed. 6 Increased housing must not and need not come at the cost of the viability of the Santa Clara River or its upland habitat, which shelters 38 federally or state-listed species in addition to many others.

7 We thought the County had learned that responsible planning for the future must at long last be dedicated to preservation of nature first and development second. It demonstrated that principle in its opposition to Ahmanson and Summit Valley in Topanga. 8 We call on you to do your duty again—to save, not destroy, the last wild river in Southern California.

Sincerely,

Roger Pugliese, Chair

D15. Letter from Topanga Association for a Scenic Community, dated January 30, 2007

Response 1

The comment is noted. No further response is required given that the comment does not address or question the content of the Draft EIR.

Response 2

The comment expresses the opinions of Topanga Association for a Scenic Community. The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not address or question the content of the Draft EIR, no further response is required.

Response 3

Numerous biological surveys over the last 13 years have been conducted on the Newhall Ranch Specific Plan site, including Landmark Village, and such surveys are found in Appendix 4.4 of the Landmark Village Draft EIR and **Appendix A** of this Final EIR. Additional biological surveys were conducted in 2007 in response to public comments. For information responsive to those surveys, please see **Introduction** to letter **D8** from the Audubon California, dated January 19, 2007.

Response 4

With regard to the claim that the Landmark Village Draft EIR only prepared limited surveys, please see **Response 3**, above.

Response 5

The comment suggests that other land can be used for housing as opposed to the project site. The comment expresses the opinions of Topanga Association for a Scenic Community. The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not address or question the content of the Draft EIR, no further response is required.

Response 6

The comment suggests that housing should not come at the cost of the viability of the Santa Clara River or its upland habitat. Please see the Landmark Village Draft EIR, Section 4.4, Biota, which addresses the

species-status species pertinent to the project site. See also, the revised **Section 4.4, Biota**, found in this Final EIR. The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not address or question the content of the Draft EIR, no further response is required.

Response 7

The comment indicates a belief that the County had learned responsible planning for future generations as evidenced in the County's opposition to Ahmanson and Summit Valley in Topanga. The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not raise an environmental issue, no further response is required.

Response 8

The comment calls on the County to save and not destroy the Santa Clara River. The comment is noted. No further response is required given that the comment does not address or question the content of the Draft EIR.

Letter No. D16

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Angeles Chapter

1-30-07

Daniel Fierros
Los Angeles County Regional Planning Dept.
320 W. Temple St.
Los Angeles, CA 90012

Re: Landmark Village DEIR and all entitlements
Emailed 1-30-07 Hard copy to follow by regular mail
Please copy to all commissioners

Dear Commissioners:

The Sierra Club continues to respectfully request that the County grant an extension of the official review period so that all comments may be included in the FEIR and circulated to commentors. We intend to submit comments on several other sections of the DEIR, but have not completed our review. 1

At this time, we submit only the following comments on the issue of ammonium perchlorate pollution because of its prominent importance to the health and well being of the Santa Clarita Valley and especially to this community's children. 2

Introductory Comments on Ammonium Perchlorate Pollution

Last year, the 60,000 member Angeles Chapter of the Sierra Club approved a resolution opposing further development approvals in the Santa Clarita Valley until facilities to remove ammonium perchlorate pollution from the water supply were actually built and functioning. (See attached Resolution). While this might seem stringent, we believe it is a necessary requirement to protect the health of the SCV community. The Water Agencies have stated since 2003 that those clean-up facilities will be functioning "next year". The County has taken them at their word and continues to approve projects based on those statements. However, those facilities are still not operational and the timetable continues to lag (See latest timetable from CLWA Agenda. We believe that not permitting future development will serve as an effective impetus to ensure that the water agencies work with all diligence to provide the necessary facilities that they claim are technologically and physically available for use. 3 4

Our second reason for approving this resolution is that, should clean up not occur, a reduction in water supply due to drought or an increase in water requirements due to all the additional building, the Santa Clarita Valley could be forced to use "blended" polluted water to provide adequate supply. Dept. of Health Services regulations (Memo 97-005) allow this scenario when there is no other water source. But we assert that such a scenario can and should be avoided by adopting the Sierra Club's position of non-approval until polluted wells are cleaned. 5

Our third reason for approving this resolution is that this pollutant specifically affects children and fetuses, by interrupting the thyroid function. Such interruption leads to retardation in these sensitive populations as well as further affecting thyroid function in those who already have hypothyroidism. (See attached report produced by Environment California). This exposure may be compounded by levels of ammonium perchlorate not showing up in milk and lettuce due to use of contaminated water in farming operations. 6

Adequacy of Water Supply Disclosure in the DEIR

When it approved the Newhall Ranch Specific Plan, the County of Los Angeles, in recognition of the potential serious impacts to water supply that the Newhall Ranch project may incur, required that each Tract Map be re-evaluated for adequate water supply. We note that the table on Page 4.10-7 and the text of this water section does not provide accurate information of water supply and may thus affect the water agencies ability to supply clean water if this project is approved. 7

First, the Santa Clara River and the Saugus Aquifer are UNADJUDICATED BASINS. That means that no particular person, landowner, project or water agency has any right to any particular amount of water from these basins. Thus the Newhall Ranch project does NOT "have its own water supply" as the text continuously implies. Rather, those sources supply all parties and agencies on a first come, first serve basis. Water used for farming by Newhall does not belong to Newhall. This resource is commonly held. ***This is a serious and apparently intentional error in the DEIR.*** 8

Since these basins are unajudicated, if water is needed to supply other areas where wells have been closed due to ammonium perchlorate pollution, it can and should be used for that purpose. In fact, CLWA intends to build wells on the west side of the Santa Clarita Valley in the Saugus Aquifer to do exactly that. 9

The table on page 4.10-7 accurately estimates the remaining unpolluted water available in the Saugus Aquifer as estimated in the Newhall County Water District's Stetson report published in November 2004. However, since that time, low levels of ammonium perchlorate were discovered in NCWD Well 13. Production amounts should be re-evaluated excluding this well, or at least indicating that this well is a risk for future closure. (See news article attached). 10

Further this table over estimates the water supply by including water banked by Castaic Lake Water Agency in various storage accounts. This stored water is only available through short-term contracts of 10-20 years. It is ***not*** a permanent water supply. It can be counted ***only*** for back-up water and may not be relied upon as a supply for new development. This fact is clearly indicated in the environmental documentation (herein included by reference) for the listed water storage projects. Thus, these supplies must be removed from table 4-10A or presented in a manner that clearly indicates that this water cannot be used to provide for additional development. 11

Again, this stored water is a temporary source available for all existing and previously approved housing units. One purpose for this water would be to provide a back-up supply in the event the ammonium perchlorate pollution spreads. Thus, it cannot be counted towards new housing approvals.

Although the DEIR purports not to rely and any state water transfer, we re-state the above objection to 12
apparent intentional mis-statements in the DEIR. This is NOT an adjudicated basin. Additional housing 13
units will be supplied on a "first come, first serve basis" (the stated policy of CLWA) and water will be provided from any available source. We therefore dispute the reliance upon any portion of the additional water transfer to CLWA under the "Monterey Amendment". Per a Court approved settlement agreement between the Dept. of Water Resources and the Planning and Conservation League, that water may not be relied upon until the new Monterey EIR is completed. Premature reliance on this supply to approve additional housing units will put a severe stress on the ability of the water agencies to supply existing users in the likely event of the continued spread of the ammonium perchlorate pollution plume. We therefore request that this DEIR remove that portion of State Water Supply indicated in Table 4-10A that comes from the Monterey Amendment transfer. 14

Failure to Comply with the Los Angeles County Development Montoring System (DMS)

As part of a Court ordered settlement, the County adopted a General Plan Amendment incorporating the Development Monitoring System in 1987. This amendment provided a system for analyzing projects that had already been approved but not yet built, pending projects and existing development to ensure that adequate infrastructure including schools, fire facilities, water, sewer and roads, would be adequate for future development. It was designed to make sure that existing infrastructure would not be overwhelmed as new approvals were built. 15

Therefore, the water section must not only show existing demand on supply, but also disclose the demand of projects that have already been approved, but not yet built. Failure to comply with the DMS by including projects that are already approved but not yet placing a demand on the water supply, will give the County an inaccurate snap shot of the real water demand picture in the Santa Clarita Valley. The "Existing Demand" column in table 4.10-A indicates only the water that is currently being pumped by the water agencies. It must also indicate demand generated by projects that are approved but not yet producing a water demand.

Closing Comments

Again, these are only our initial comments and pertain only to the ammonium perchlorate pollution issue. We hope to provide you with additional comments on biology, geology, air pollution, traffic, water quality and water supply in the near future. 16

Sincerely,

Jennifer Robinson
Conservation Coordinator
Angeles Chapter.

Attachments:
Angeles Chapter Resolution on Ammonium Perchlorate in the Santa Clarita Valley
CLWA Time Table For Pollution Clean up Facilities
"Perchlorate and Children's Health"
News Article on NCWD Well 13

Cc: Daily News
Newhall Signal
LA Times

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Suite 320
Los Angeles, CA 90010-1904

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Resolution of the Executive Committee of the Angeles Chapter

The Angeles Chapter opposes additional land use approvals in Santa Clarita that rely on water from the contaminated Saugus aquifer until clean up facilities to remove the ammonium perchlorate, NDMA and other pollutants from this ground water source are functioning.

Approved unanimously
7-23-06

ITEM NO. 4

Castaic Lake Water Agency
Memorandum

January 19, 2007

To: CLWA Planning and Engineering Committee

From: William J. Manetta
Acting Engineering and Operations Manager

Subject: Perchlorate Remediation Program

SUMMARY

Work continues on multiple tasks to address the groundwater contamination stemming from past manufacturing activities on the Whittaker-Bermite site. The Agency and purveyors are proceeding to restore the production capacity of the groundwater supply wells contaminated by perchlorate, while working on the objectives of containing the downgradient migration of perchlorate and recovering costs incurred in responding to the perchlorate contamination. *(Goal 2.1.5: Treat 2,400 gallons per minute of water from the Saugus Formation that is contaminated with perchlorate and restore to potable water service. Goal 2.1.6: Develop replacement wells for capacity lost due to perchlorate contamination.)*

DISCUSSION

The Agency has authorized Black & Veatch (B&V), Carollo Engineers (CE) and Kennedy/Jenks Consultants (K/J) to assist in providing services to respond to the various tasks associated with the Perchlorate Remediation Program. The following table provides a status report on the activities and tasks:

Task Group	Tasks	Consultant	Status
Settlement Activities	Project Description	K/J	Complete.
	Final Settlement	K/J, Nossaman	Negotiations ongoing.
DTSC Approval Activities	Remedial Investigation (RI)	K/J	DTSC approved 8/16/05.
	Feasibility Study (FS)	K/J	DTSC approved 8/16/05.
	Draft Remedial Action Plan (RAP)	K/J	DTSC approved 8/16/05.
	Final RAP	K/J	Public Hearing held 9/7/05. DTSC approved 1/20/06.
U.S. Army Corps of Engineers Feasibility Phase Study	Conceptual Hydrogeology Technical Memorandum	CH2MHill	Final distributed 1/19/05. Progress report with model construction calibration distributed 10/11/05.
U.S. Army Corps of Engineers Feasibility Phase Study	Monitoring	CH2MHill	Federal FY 2005 funding provides for limited monitoring of existing test wells and testing of NCWD NC13 Southern Saugus well. Completed 6/14/06.

Task Group	Tasks	Consultant	Status
DHS Approval Activities (97-005)	Source Water Assessment	B&V, CE	Received comments on revised document from DHS 4/27/06.
	Water Quality Investigation	B&V, CE	Received comments on revised document from DHS 4/27/06.
	Source Protection Plan	B&V	Received comments on revised document from DHS 4/27/06.
	Effective Monitoring and Treatment	B&V, CE, CH2MHill	Received comments on revised document from DHS 4/27/06.
	Human Health Risk	B&V	Received comments on revised document from DHS 4/27/06.
	Alternatives Evaluation	B&V, CE	Received comments on revised document from DHS 5/10/06. Revised document will be returned to DHS with Engineer's Report.
	Engineers Report	B&V	Responded 12/19/06 to DHS comments received 12/1/06 on Final Draft submitted to DHS 10/27/06.
	CEQA	B&V	Mitigated Negative Declaration certified 9/14/05.
	Permit Application	B&V	Pending design completion.
	Public Hearing	B&V	Pending design completion.
	DHS Evaluation & Permit	B&V	Pending design completion.
Implementation Activities	Easements and Right of Way	K/J	Alignment studies complete 8/08/05. Document preparation in progress.
	Treatment Design	K/J	Scheduled design completion 1/07.
	Pipeline Design	K/J	Scheduled design completion 1/07.
	Construction	K/J	Plan to start 3/07.
	Startup and Monitoring	K/J	Scheduled 12/07.

The City of Santa Clarita's Multi-Jurisdictional Task Force and Citizens Advisory Group meetings will be held on February 7, 2007. The next bi-monthly DTSC meeting will be held on January 31, 2007.

FINANCIAL STATUS

Settlement negotiations are ongoing with the purveyors, Whittaker-Bermite and insurance carriers.

JRL

2

Perchlorate and Children's Health

The Case for a Strong Cleanup Standard for Rocket Fuel in Drinking Water

Travis Madsen
Sujatha Jahagirdar

ENVIRONMENT CALIFORNIA

March 2005 Edition

Acknowledgments

Environment California Research & Policy Center thanks Dr. Gina Solomon of the Natural Resources Defense Council and the University of California San Francisco, Renee Sharp of the Environmental Working Group, and John Rumpler, Esq. of the Center for Public Interest Research / Environment California for reviewing drafts of the document and providing helpful feedback; and Tony Dutzik of the Center for Public Interest Research / Environment California for editorial assistance.

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For more information about Environment California and Environment California Research & Policy Center, please call (213) 251-3688 or visit our Web site at www.environmentcalifornia.org.

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Update:

Perchlorate Developments from Early 2005

In the following pages, Environment California Research & Policy Center offers a detailed case for a comprehensive cleanup of perchlorate from California's drinking water, based on the best available science. However, since the first release of this report in January 2005, several new developments have shed additional light on the extent of the perchlorate problem and the need for action.

In January, the National Academy of Sciences released a long-awaited review of the state of scientific knowledge on perchlorate. The U.S. EPA, following the recommendation of the National Academy, then issued a revised "safe level" of perchlorate intake. Finally, researchers at Texas Tech University published a first-of-its-kind study of perchlorate levels in breast milk, demonstrating widespread infant exposure to unsafe amounts of perchlorate, amounts that exceed the National Academy and EPA recommendation. In fact, the study shows that some infants are exposed to perchlorate in levels shown to harm brain development in infant rats.

Taken together, these developments highlight the need to aggressively implement a cleanup plan that will protect the health of California's children, and of children nationwide. Infants are smaller and more vulnerable than adults. Infants are also exposed to contaminants through breast milk and a variety of other sources. As a result, they need special consideration when setting drinking water standards for developmental toxins. The new information brought to light strengthens the case for protecting California's children and infants by reducing perchlorate contamination in drinking water to one part per billion (ppb) or less.

National Academy of Sciences Releases Perchlorate Review

On January 10, 2005, the National Research Council of the National Academy of Sciences (the Academy) released a report entitled *Health Implications of Perchlorate Ingestion*. The report summarizes an

The Difference Between A Drinking Water Standard and a "Safe Dose"

The Academy calculated a "safe dose," or an amount an individual could consume in a day and theoretically suffer no harm. Translating the dose into a drinking water standard requires adjustments to ensure that no one is exposed to more perchlorate than considered safe. Adjustments are made for exposure to perchlorate from additional sources including food, and for body weight and drinking water intake.

18-month review of the health risks of perchlorate exposure. The review was requested by the Department of Defense and NASA to resolve concerns voiced by perchlorate users over the scientific certainty of an earlier U.S. EPA recommended "safe level" of perchlorate intake.

Press coverage focused on the Academy's conclusion that perchlorate was not quite as hazardous as the EPA estimated earlier. However, some articles mistakenly implied that the report would lead to a weaker drinking water standard or would prevent cleanup of some contaminated areas. Actually, the Academy report supports the conclusion that California's drinking water standard for perchlorate should be set no higher than one part per billion in order to protect infants, as argued in the following pages.

The Academy calculated a "safe dose," but refrained from recommending a level for an enforceable drinking water standard (see "The Difference Between a Drinking Water Standard and a "Safe Dose"). Members of the National Academy panel made a point of emphasizing that any eventual drinking water standard should take into account the contribution of food and other sources to overall exposure.[1] The Academy panel also made it clear that a drinking water standard should take into account the body weight of the class of individuals it is meant to protect, to ensure that the most vulnerable are kept safe.[2]

In other words, the Academy recognized that agencies setting enforceable standards for perchlorate in drinking water have additional decisions to make. First, agencies must decide which population of people the standard is meant to protect. Second, agencies must take into account additional exposure sources beyond drinking water to ensure overall safety. In the case of perchlorate exposure:

- Infants are most vulnerable to harm. Infants are less able to compensate for the toxic effects of perchlorate, are at a critical stage in growth and development, and also consume more water per kilogram of body weight than an adult.
- Infant exposure to perchlorate from food and breast milk (via a mother's exposure to perchlorate-laced food and water) must be considered in addition to water.

In mid-February 2005 the U.S. EPA issued an updated recommendation for the maximum "safe dose" of perchlorate. Essentially, the EPA revised its earlier calculation based on the advice of the

National Academy of Sciences. Press coverage of this action almost uniformly confused the "safe dose" with a drinking water standard. The EPA has not yet issued an enforceable drinking water standard.

Perchlorate Found in Breast Milk at High Levels

On February 23, Andrea Kirk and her colleagues in the Dasgupta lab at Texas Tech University published a study showing that unsafe levels of perchlorate are commonplace in the breast milk of women across the country.[3] According to the study, breast-fed babies ingest more than twice as much perchlorate on average than the National Academy of Sciences' recommended "safe dose."[4]

The Texas Tech researchers found perchlorate in the breast milk of every one of 36 women tested across the country, at an average level of 10.5 ppb, ranging up to 92 ppb. The high levels suggest that women may concentrate perchlorate in their breast tissue to some extent. Infants exposed to the highest levels of contamination would receive a dose large enough to interfere with normal brain development in infant rats, as determined from laboratory tests.

Sources of the contamination likely include food tainted by perchlorate-laced irrigation water. In November 2004, the U.S. Food and Drug Administration released the results of a survey of perchlorate levels in common food items across the country. Perchlorate was detected in most or all samples of lettuce and milk from supermarket shelves, including 38 of 38 milk samples and 67 of 78 lettuce samples from California.[5] The levels were higher than many experts anticipated, reaching a maximum level of 9.9 ppb in milk and 52 ppb in lettuce, with average levels at 5.7 ppb and 9.4 ppb, respectively.

Implications for California's Perchlorate Health Goal

In light of the new developments of the first two months of 2005, California officials should take immediate action to reduce the heath threat posed to infants by perchlorate contamination. Appropriate steps include:

- Maintaining a focus on infants as the most vulnerable population;
- Revising the public health goal downward to one part per billion or less;
- Issuing an emergency enforceable drinking water standard to begin the cleanup process;
- Taking aggressive steps to clean the Colorado River.

California officials should maintain a focus on infants as the most vulnerable population. Assembly Bill 2342, signed by Governor Schwarzenegger in 2004, requires California EPA to specifically consider the health of infants and children when setting a public health goal.

Given the new developments of early 2005, California EPA will need to adjust its public health goal for perchlorate in drinking water. In particular, in deriving the public health goal, California EPA inappropriately reduced the margin of safety when calculating the "safe" drinking water level for infants and underestimated infant exposure to perchlorate from sources other than drinking water.

As described in the following pages, California EPA applied a margin of safety of ten-fold to protect the most vulnerable adults. However, it *reduced* the margin of safety to three-fold when calculating a safe level of perchlorate in drinking water for infants. The National Research Council made it clear that this approach was unwarranted.[6]

In light of new data on perchlorate levels in breast milk and food, California EPA underestimated the amount of perchlorate that could be ingested outside of drinking water, especially for infants. California EPA assumed that 100 percent of infant perchlorate exposure would come from drinking water. However, many infants are breastfed during their first year of life, and from this source alone are exposed to already dangerous levels of perchlorate. California EPA should fully account for all additional sources of perchlorate ingestion in infants, using newly available data.

With a full uncertainty factor of 10 or more to protect infant children from rocket fuel in drinking water, and a more accurate accounting of infant perchlorate exposure from all sources, California EPA should revise its public health goal to a more protective level of one part per billion or less.

While the process of revising the public health goal moves forward, state officials should issue an emergency drinking water standard for perchlorate to kick-start the cleanup effort. In particular, removing perchlorate from the Colorado River, a source of irrigation water and drinking water for much of Southern California, should be prioritized.

For further information, please contact Sujatha Jahagirdar, Clean Water Advocate, at (213) 251-3688.

(Copies of *Health Implications of Perchlorate Ingestion* are available online at www.nap.edu; the results of FDA monitoring of food for perchlorate are available at www.fda.gov; and the Texas Tech breast milk study is available at pubs.acs.org/journals/esthag.)

Update Notes:

1. During a public briefing given on 11 January 2005, the National Academy Panel clarified that the result presented in their report was a reference dose, or an amount of perchlorate safe to ingest, corrected for body weight, and not a drinking water standard. In order to obtain a drinking water standard, the reference dose must be corrected for drinking water intake, perchlorate ingestion from other sources than drinking water, and infant body weight. A committee member said, "The committee recognizes that its recommendations would lead to a reference dose of 0.0007 milligrams per kilogram per day. Now that's a dose. That's not a content in water. That's a total amount, whatever the source is – food, milk, water – that we felt would be a safe limit, a safe and health protective limit." Statement by NAS committee member at "Health Implications of Perchlorate Ingestion," public briefing held on 11 January 2005 at 2 PM EST, available online at www.visualwebcaster.com/event.asp?id=26586, at time 25:28.

2. (Referring to the safe dosage) "This 0.0007 milligram per kilogram – adjusted for body weight – so if it's a three kilogram baby, you adjust it down. If its an 80 kilogram adult, you adjust it up. It's based on a per kilogram." Ibid, at time 26:30.

3. Andrea Kirk et al, "Perchlorate and Iodide in Dairy and Breast Milk," *Environmental Science and Technology*, ASAP Article 10.1021/es048118r S0013-936X(04)08118-0, 22 February 2005.

4. For calculation, see Peter Waldman, "Perchlorate in Human Milk Exceeds Regulator's 'Safe Dose'" *Wall Street Journal*, 23 February 2005.

5. U.S. Food and Drug Administration, *Exploratory Data on Perchlorate in Food*, downloaded from www.cfsan.fda.gov, 26 November 2004.

6. A committee member said, "I'll just conclude, before we open for questions, by pointing out where the committee stopped. We stopped at a dosage – what we felt would be a safe limit to the amount, whatever the source, of perchlorate that an individual might take in. This is 0.0007 mg/kg-day – adjusted for body weight – so if it's a 3 kilogram baby, you adjust it down." In this statement, the panel makes it clear that the reference dose must be adjusted for body weight without changing the margin of safety applied to protect vulnerable groups, such as pregnant women, infants, and people with hypothyroidism. See note 1, at time 38.25.

Executive Summary

In order to protect expecting mothers, their developing fetuses and their infant children, the California Department of Health Services (DHS) should set a final health standard for perchlorate in drinking water at one part per billion or less.

Perchlorate, the primary ingredient in solid rocket fuel, is emerging as a major contaminant of California's food and water supplies. The U.S. Food and Drug administration recently documented widespread contamination in milk and lettuce from grocery stores in California and across the country. Many water suppliers in California have detected perchlorate in their wells at levels suggested by the U.S. Environmental Protection Agency (EPA) as unsafe.

- State agencies have discovered perchlorate pollution in more than 350 water sources, including the Colorado River and hundreds of municipal wells.
- The bulk of the contamination was caused by the military, aerospace contractors and other users and manufacturers of explosive chemicals.
- Communities with contaminated water supplies include Riverside, Loma Linda, San Bernardino, Pasadena, Rancho Cordova, West Orange County, and Otay.

Perchlorate exposure threatens expecting mothers, developing fetuses and infant children.

- Perchlorate affects the thyroid hormone system at very low levels of exposure. It acts by preventing uptake of iodine into the thyroid gland, reducing the gland's ability to produce enough hormone.
- Thyroid hormone and iodine are critical for normal brain development in fetuses and young infants. Children born to mothers with thyroid problems or iodine deficiency can have lower IQ, impaired learning, hyperactive behavior, delayed growth, or can suffer a range of serious neurodevelopmental problems, including mental retardation.
- Exposure to perchlorate during specific and important windows of

time during the growth and development of a child increases the risk of neurodevelopmental disability.

Neurodevelopmental disabilities, like attention deficit and hyperactivity disorder (ADHD), are a serious and growing problem in California.

- Learning-disabled students increased 65 percent faster than the general school population from 1985 to 1999.
- Perchlorate exposure could be contributing to this trend in combination with exposure to a variety of other chemicals polluting the environment such as toxic flame retardants, lead, mercury, and polychlorinated biphenyls (PCBs).

The evidence of perchlorate's toxicity warrants a strong drinking water standard of one part per billion or less.

- Exposure to low levels of perchlorate *in utero* leads to changes in brain structure and behavior in infant rats.
- Humans are as sensitive as rats to iodine uptake inhibition by perchlorate.

After evaluating the full spectrum of available science on perchlorate, the U.S. Environmental Protection Agency and the states of Massachusetts, Maryland and New Mexico have recommended preliminary drinking water health guidelines of one part per billion or less to provide a margin of safety for developing fetuses and infants. Accounting for widespread exposure to perchlorate in the food supply and for the combined effects of other thyroid toxicants in addition to perchlorate would justify an even lower standard.

However, the state of California is unofficially moving forward with a final drinking water standard equivalent to the public health goal of six parts per billion issued in March 2004. The process used to arrive at the public health goal did not live up to the criteria established by California law, and a standard set at this level would be inadequate for several reasons:

- California EPA chose a single scientific study as the main basis for calculating a safe level. The study examined the effect of perchlorate on healthy adults exposed for a short period of time, as opposed to including other research involving fetal and newborn rats with long-term perchlorate exposure.
- California EPA applied an atypically small margin of safety to ensure protection of especially vulnerable people. Almost all established public health goals in California use a larger margin of safety.
- California EPA failed to consider how perchlorate may be interacting with other thyroid toxicants (like toxic flame retardants, nitrates, PCBs and other common environmental contaminants) to contribute to neurodevelopmental problems in children.
- A final standard of six parts per billion could leave the contamination of the Colorado River and nearly one-third of the polluted wells in California unaddressed.

In setting a final perchlorate standard, the state should use the weight of scientific evidence, including experiments showing neurobehavioral damage to infant rats exposed to small amounts of perchlorate in the womb, as well as considering the possible interaction of perchlorate with other toxicants. In addition, the state should set larger margins of safety to account for uncertainties in the vulnerability of fetuses and infants to

long-term exposure to low levels of perchlorate. After taking these steps, the state should arrive at a drinking water standard for perchlorate of 1 part per billion or less, ensuring a comprehensive cleanup and providing a margin of safety for pregnant women, their developing babies and their infant children.

POLICY RECOMMENDATIONS

- **The California Department of Health Services should set the drinking water standard for perchlorate at one part per billion or less.**
- In addition, the State of California, local governments, and water suppliers should hold responsible parties fully liable for cleanup and for supplying replacement drinking water to affected communities. Congress should not exempt the Department of Defense.
- Congress should reinstate Superfund fees for polluting industries to ensure that contamination caused by now-bankrupt companies will be cleaned up.
- Federal and state agencies should require American Pacific, Kerr-McGee Chemical and other responsible parties to accelerate clean up of perchlorate contamination currently leaking into the Colorado River and local aquifers.

Introduction

Governments have a responsibility to protect their citizens from threats to their health and well-being, especially those threats beyond individual control. Take, for example, toxic contamination in public food or water supplies. To protect the public, governments often set health standards to limit public exposure, minimize risk, set a threshold for cleanup, and allow cost recovery from those responsible for spilling dangerous waste.

California law requires a comprehensive approach to setting health standards for toxic chemicals. In setting a standard, officials must:

- Protect the most vulnerable people from known or anticipated threats to their health and well-being;
- Ensure an adequate margin of safety to ensure that uncertainties in the science today do not cause public health problems in the future;
- Explicitly consider the many sources of exposure to a toxicant, including food and milk, and how the toxicant might interact with other harmful substances in the environment to have a more dangerous effect; and
- Place emphasis on public health when considering cost and feasibility.[1]

In practice, however, the implementation of these requirements is often hindered. Companies with a potential liability for toxic spills can—and often do—attempt to protect their financial interests by pushing for public health standards that are weaker than sound science would dictate.

The debate around perchlorate in drinking water is a case in point. Perchlorate manufacturers and users, including the Department of Defense and its contractors, have attempted to focus the health debate around the needs of healthy adults in an effort to set a weak standard and thus limit their financial liability for contaminating much of California's drinking water supply.

But the real threat of perchlorate is to the health and development of young children. Exposure to small amounts of perchlorate, whether in the womb or during the sensitive first few years of life,

has the potential to set children back in their mental development.

The choice in setting a health standard for perchlorate is a choice between protecting the financial interests of a handful of companies and government agencies, or protecting California's children.

California's children are the future of our society. They need protection from threats to their health and well-being in order to have the greatest possible opportunity to grow into their full potential. Establishing a reasonable perchlorate standard based on the weight of the scientific evidence would be in their best interest.

Perchlorate Contamination Plagues California's Drinking Water Supplies

Perchlorate, the major ingredient in solid rocket fuel, contaminates the drinking water supply of 16 million Californians.

The vast majority of perchlorate in the United States is synthetic.[1] It is manufactured by chemical companies and then sold to producers and users of rockets, flares and other related technologies. The U.S. Environmental Protection Agency estimates that the Department of Defense and NASA use about 90% of the perchlorate produced in the United States.[2]

Perchlorate travels easily in water, allowing spills to easily enter water supplies, and persists for many decades underground.[4] Through careless handling, use, storage and disposal of perchlorate over the last six decades, the military and its contractors have extensively polluted California's drinking water sources. State agencies have discovered perchlorate pollution in more than 350 California water sources, including the Colorado River and hundreds of municipal wells.

The Colorado River

Beginning in the 1950s, large amounts of perchlorate were made at factories owned by American Pacific and Kerr-McGee corporations outside Las Vegas, in an area draining into Lake Mead and the Colorado River.[5] Dumping, spills and explosions left the area around these factories heavily contaminated. Professor Jacimaria Batista at the University of Nevada estimates that sediments downstream from the perchlorate factories hold more than 20 million pounds of the chemical.[6] Wastewater from the city of Las Vegas carries the perchlorate downstream to Lake Mead. In 2004, 200 to 300 pounds of perchlorate leached into Lake Mead every day.[7]

The contaminated water then travels down the Colorado River, which is used as a municipal water supply for millions of people in Arizona and Southern California and as a source of irrigation water for much of the nation's winter produce.

Figure 1: Perchlorate Contamination in the Lower Colorado River[12]

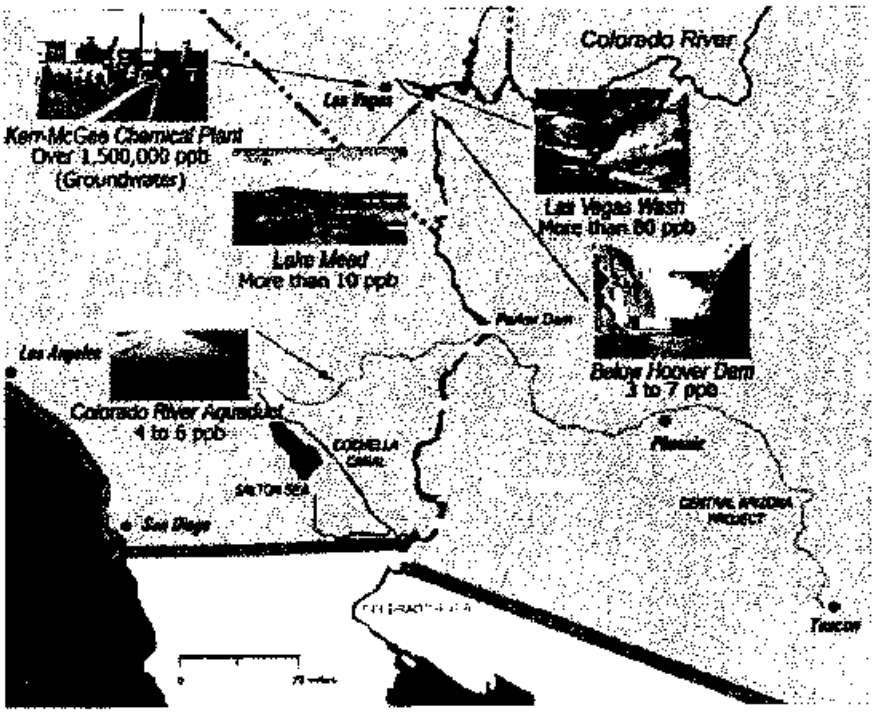


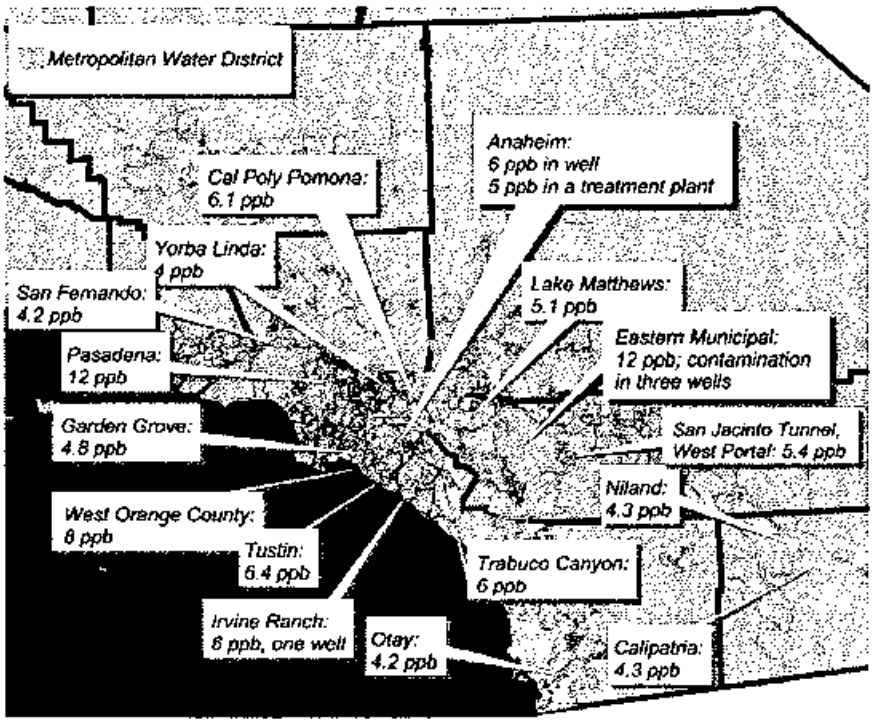
Table 1: Number of Perchlorate Contaminated Wells by County[14]

County	Number of Contaminated Wells
Los Angeles	138
San Bernardino	82
Riverside	68
Orange	34
Sacramento	15
Santa Clara	9
Tulare	8
Ventura	4
San Diego	1
Sonoma	1
Stanislaus	1

Since 1998, over 1.4 million pounds of perchlorate have leaked into the Colorado River.[8] Near Lake Mead, perchlorate levels have been measured as high as 24 parts per billion.[9] Water taken from the river by the Metropolitan Water District of Southern California contains up to six parts per billion perchlorate (Figure 1).[10]

At the current pace of cleanup and with natural flushing of the river, Dr. Batista and her colleagues estimate that the lower Colorado River will remain contaminated with perchlorate for the next 50 years.[11]

Figure 2: Peak Perchlorate Levels Measured in Selected Southern California Water Systems, 2003[18]



Perchlorate can be found in the drinking water supplies of many communities in Southern California. Metropolitan Water District distributes Colorado River water, contaminated with perchlorate from a chemical plant in Nevada, to communities across the south coast. Other communities face perchlorate contamination in their aquifers, from spills as well as using Colorado River water for recharge.

Aquifers and Wells

Perchlorate users have also contaminated many underground water systems across the state. The contamination extends into more than 10 counties, including San Bernardino, Sacramento, Los Angeles, Riverside, Ventura, Tulare, Orange, Santa Clara, Sonoma and San Diego (Table 1).[14] Southern California communities in Los Angeles and the Inland Valley have been hard-hit (Figure 2), as well as Northern California communities such as Rancho Cordova outside of Sacramento.

Underground water contamination has come from both direct spills of perchlorate, as well as the use of polluted Colorado River water to recharge aquifers in Orange County and across southern California. In all, perchlorate has been found in at least 350 major California water sources.

Contamination in Food

The impact of perchlorate is not limited to drinking water. Perchlorate also concentrates in leafy vegetables like lettuce, which creates a concern for consumers of Imperial Valley crops irrigated with Colorado River water. Tests by scientists and advocacy organizations like the Environmental Working Group have confirmed that plants, especially broad-leaf varieties, concentrate perchlorate from the environment.[15] Scientists have found perchlorate in plant tissues at levels up to 100 times higher than in nearby water sources.[16]

In November 2004, the Food and Drug Administration released the results of an initial nationwide food screening. They found perchlorate in 90 percent of 128 lettuce samples and in all but three of 104 milk samples, with average levels ranging from six parts per billion in milk to 12 parts per billion in Romaine lettuce.[17] These results raise the possibility that perchlorate contamination is much more widespread than regulators currently know, and that exposure is widespread across the country.

Perchlorate Threatens Developing Fetuses and Infant Children

Perchlorate poses the greatest threat to developing fetuses and infant children. Exposure to perchlorate during key windows of time in the growth and development of a baby could lead to impaired brain development, causing lowered IQ, reduced learning ability, attention deficits and hyperactivity.

Perchlorate poses a threat because it affects the thyroid hormone system. It acts by preventing uptake of iodine into the thyroid gland, reducing the gland's ability to produce enough hormone. Expecting mothers need healthy thyroids to properly direct brain development in their developing fetuses. Children born to mothers with thyroid problems often have lower IQ, impaired learning, hyperactive behavior and delayed growth, and can suffer a range of serious problems, including mental retardation. Thyroid problems in infants after birth can also cause similar harm.

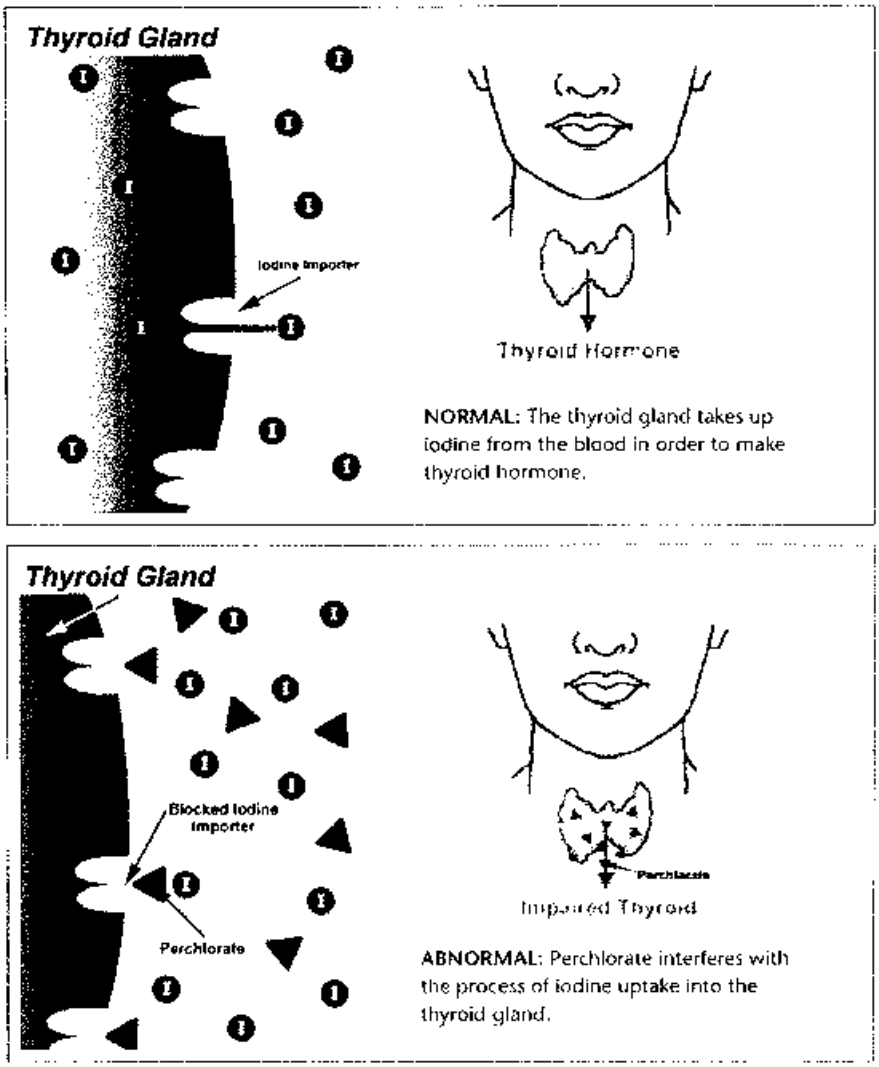
Despite claims by perchlorate users and manufacturers that perchlorate does not cause health problems, experiments with humans and animals clearly show that perchlorate interferes with iodine uptake into the thyroid gland. In rats exposed in the womb, perchlorate causes changes in the shape of the brain and leads to impaired behavior. Human infants, who have no extra stores of thyroid hormone, are especially vulnerable thyroid toxicants like perchlorate.

These facts are all the more alarming when the increasing trends in neuro-developmental and mental health disabilities in California are considered. The number of students in public schools suffering from a variety of learning disabilities, including Attention Deficit Hyperactivity Disorder (ADHD), increased 65 percent faster than the general school population from 1985 to 1999. While no one factor has been implicated, perchlorate could be contributing to this trend in combination with toxic flame retardants, pesticides and the well-established culprits of lead, mercury, dioxin and polychlorinated biphenyls (PCBs).

Perchlorate Impairs the Thyroid Hormone System

Perchlorate primarily affects the thyroid hormone system. In the body, perchlorate

Figure 3: Perchlorate Impairs the Production of Thyroid Hormone by Preventing Iodine Uptake Into the Thyroid Gland



Under normal circumstances, the thyroid gland is able to take up iodine and use it to make thyroid hormone, important for regulating metabolism in adults, and critical for normal brain development in fetuses and infant children. However, perchlorate inhibits iodine uptake into the thyroid gland, impairing the ability of the gland to produce the appropriate amount of hormone. In expectant mothers, this can have serious consequences for the child, including reduced IQ, and impaired attention and behavior as the child grows up.

acts to reduce the levels of circulating thyroid hormones. It inhibits the uptake of iodine into the thyroid gland, required for the production of thyroid hormone (Figure 3).[19] Scientists discovered this property over 50 years ago, and physicians have used perchlorate to treat diseases involving an over-active thyroid gland, such as Grave's disease.[20]

Impaired Thyroid Function Leads to Problems in Brain Development, Learning, and Behavior

When the thyroid hormone system malfunctions, children can end up with serious behavioral and learning problems. The thyroid hormone system plays a critical role in the complex process of brain development. It provides important signals that help direct the growth of brain tissue into the structures that give children the capabilities to perceive and organize information, learn, remember, and grow into fully functional adults.[21]

Most of the cognitive capability of the brain develops between the eighth week of pregnancy and the second year of life.[22] During this period, the developing brain is most vulnerable to damage.

Scientists know that disruptions in maternal thyroid levels as early as week eight in the womb can impair a child's intelligence and coordination. Too little thyroid hormone delivered from mother to fetus during brain development can decrease the number of cells in the mature brain, impairing neurological development, with consequences including learning disabilities, speech and memory problems, poor coordination and balance, or—in severe cases—mental retardation.[23]

Mothers with thyroid problems caused by iodine deficiency also have children more likely to suffer from neuro-

Reduced thyroid levels in the first few weeks of life for pre-term and low birth-weight babies are associated with increased risk of neurological disorders, including the need for special education by age nine.

developmental birth defects. In areas with chronically low iodine levels in the food supply, mothers have symptoms of hypothyroidism and give birth to children with impaired physical and mental development.[24] On average, children of iodine-deficient mothers have 5 to 13 fewer IQ points compared to children of mothers with iodine-sufficient diets.[25] Children of mothers with severe iodine deficiency are more likely to have congenital defects, mental retardation, impaired physical growth and a variety of severe disabilities and neurological disorders including deafness.[26]

Newborns in particular are likely to be much more vulnerable to perchlorate than adults. They have no thyroid hormone stored in their glands, they have a very small body weight, and thyroid hormone in their blood recycles more quickly than in adults.[27] Reduced thyroid levels in the first few weeks of life for pre-term and low birth-weight babies are associated with increased risk of neurological disorders, including the need for special education by age nine.[28]

Because perchlorate interferes with the thyroid hormone system, perchlorate exposure is likely to cause the same problems as iodine deficiency and hypothyroidism, with potentially severe and lifelong consequences for the developing child.

Thyroid Disruption and ADHD

Evidence exists that changes in thyroid hormone levels may be part of the cause of Attention Deficit Hyperactivity Disorder (ADHD). Dr. Peter Hauser at the National Institutes of Health found that families with a genetic problem that reduces the function of the thyroid hormone system were more likely to have symptoms of ADHD. In the study, 70 percent of children from families with genetic thyroid problems had ADHD, while the disorder affected 20 percent of children in normal families.[29] In another experiment, Dr. Michael McDonald at the National Institute of Mental Health showed that mice with the same genetic defect in their thyroid hormone systems developed symptoms of ADHD, including hyperactivity and impaired learning ability.[30]

Direct Evidence of Perchlorate's Effects

The strongest evidence that perchlorate exposure is likely to cause effects similar to iodine deficiency or thyroid imbalance in expectant mothers and newborns comes from experiments in which mammals were intentionally and directly exposed. Most of the recent research has been funded by the Department of Defense, an agency with a financial interest in avoiding cleanup of perchlorate contamination. Despite this potential bias, the Department of Defense-funded studies provide more than enough evidence of perchlorate's toxicity to warrant a comprehensive cleanup effort.

On average, children of iodine-deficient mothers have 5 to 13 fewer IQ points compared to children of mothers with iodine-sufficient diets.

These studies support the picture of the potential health effects of perchlorate presented in the previous section. They demonstrate that perchlorate exposure changes thyroid hormone levels and can affect the brain structure and behavior of rat pups exposed while in the womb and after birth, and that perchlorate alters the function of the thyroid gland in humans.

Specifically, the direct perchlorate exposure studies demonstrated:

- inhibition of iodide uptake into the thyroid gland in humans and animals,[31]
- perchlorate-induced changes in thyroid hormone production,[32]
- physical changes (including tumors) in the thyroid gland of rats exposed to perchlorate *in utero* and through mother's milk,[33]
- perchlorate-induced changes in brain structure and behavior in rat pups exposed *in utero* and after birth.[34]

- Additionally, researchers at the University of Wisconsin found that exposure to perchlorate interfered with the maturation of the reproductive system in female rats. After exposure to perchlorate in the womb, rats developed fewer follicles in their ovaries.[35]

In the context of the debate around how much perchlorate is dangerous, one direct exposure-response study has received particularly extensive attention. In this study, Dr. Monte Greer and his colleagues gave differing amounts of perchlorate to healthy adult human volunteers over the course of two weeks, and measured the inhibition of iodine uptake into the thyroid gland.[36] This study found a clear and direct relationship between the amount of perchlorate exposure and the degree of iodine uptake inhibition in the human thyroid. When compared with similar experiments carried out in rats, it shows that humans are as sensitive as rats to iodine uptake inhibition by perchlorate.

The Greer study has been used by many regulatory agencies in the process of deriving health recommendations, because of the high quality of the data. However, the study also has limitations that are important to consider in the process of setting a health standard. For example, the study did not directly address the effects of perchlorate on vulnerable individuals (such a study would be ethically intolerable), the study involved short-term perchlorate exposure as opposed to long-term exposure of the type likely caused by contaminated drinking water, and the study had a small number of subjects, limiting its ability to detect iodine uptake inhibition at low exposure levels. These issues are explored more fully in the section on California's Public Health Goal (See page 25). Despite these limitations, the Greer study does offer solid support for the idea that perchlorate exposure increases the risk of brain development problems in human infants by interfering with the thyroid gland.

Studies Used by Industry to Argue that Perchlorate Isn't Dangerous

Scientists have also looked for evidence of perchlorate-caused harm in communities with water contamination. Many of these studies have been funded by perchlorate manufacturers or users (see "Major Polluters and Their Public Relations Consultants" on page 19), and have been used in public relations campaigns as evidence that perchlorate is not harmful in small doses. However, by their nature, these types of studies—known as ecological studies—are prone to ambiguity. There are many possible influences that could cloud the results, including diet, nutritional status, exposure to other chemicals, natural changes in thyroid status with age and air temperature, and more. It is much more difficult to draw conclusions when past perchlorate exposure cannot be directly measured. Most ecological studies involve no more than two exposure categories: exposed and not exposed, with great potential for misclassification. Health outcomes are also more difficult to measure—especially subtle neuro-developmental deficits that are likely not detectable by commonly-used hormone status tests. Because of these issues, ecological studies are less likely to discover a connection between chemical exposure and health effects, even when one actually exists.

The studies regularly cited by the perchlorate industry include:

- Five studies of neonatal thyroid hormone status in areas with contaminated drinking water.[37] (Funded by members of the Perchlorate Study Group and carried out by Consultants

in Epidemiology and Occupational Health, Inc., and Exponent, Inc.)

- A study of the general population, looking for differences in thyroid disease prevalence in areas with perchlorate in the water and without.[38] (Funded by American Pacific Corporation and carried out by Consultants in Epidemiology and Occupational Health, Inc.)

- A study of ADHD and autism in Nevada, looking for evidence that areas with perchlorate in the water had higher prevalence of these diseases.[39] (Funded by American Pacific Corporation and carried out by Consultants in Epidemiology and Occupational Health, Inc.)

- A study of school-age children from three different cities in Chile, looking for connections between perchlorate exposure and thyroid hormone status.[40] (Funded by the Kerr-McGee Chemical Corporation and carried out by ICF Consulting). (This study yielded complicated results, including some positive findings and strange anomalies in the data. However, industry characterizes its findings as negative.)

The EPA thoroughly reviewed all but the most recent of these studies, and discusses their weaknesses in detail in a 2002 report on perchlorate and in a document responding to the comments of peer reviewers.[41] In summary, the EPA concluded that these studies "offer little help beyond indicating that clinical thyroid disease is not greatly increased in populations with sustained drinking water contamination as high as 15 micrograms per liter [15 parts per billion] in the past," failing to answer any questions about perchlorate and neurobehavioral disease.[42] In fact, one of the peer reviewers noted that studies with this type of design are prone to flaws; for example, one of the largest ecological studies of radioactive radon gas found a negative association between exposure and incidence of lung cancer—a result that directly contradicts many laboratory studies, as well as common sense.[43] Ecological studies of perchlorate could be giving similarly confusing results.

Two additional studies of infant thyroid health in areas with contaminated drinking water demonstrated a positive link between perchlorate exposure and impaired thyroid status. First, the Arizona Department of Health Services found differences in thyroid hormone levels among infants whose mothers were exposed to perchlorate-contaminated drinking water from the Colorado River and those who had not been exposed to perchlorate while pregnant.[44] Second, Jackie Schwartz, then a public health graduate student at U.C. Berkeley, found that infant thyroid hormone levels were significantly lowered when mothers were exposed to drinking water contaminated with perchlorate at levels as low as one to two parts per billion, with stronger effects at higher doses.[45] These studies also suffer from the same sources of uncertainty as the industry-funded studies discussed above. However, the EPA considers the Schwartz study the most convincing of the whole set because of its relatively detailed exposure classifications, variety of controls, and strong statistical analysis. The two studies that found a positive perchlorate effect are the only two studies not funded by members of the Perchlorate Study Group.

Because of limitations associated with the ecological studies involving perchlorate, the U.S. EPA and state environmental agencies uniformly decided against using them in the development of any quantitative health standards.

Major Polluters and Their Public Relations Consultants

The Department of Defense

The Department of Defense is the largest user of perchlorate in the country. Along with NASA, it is responsible for roughly 90 percent of all perchlorate used in the U.S. The Department of Defense works with a group of aerospace contractors and chemical companies that supply perchlorate and perchlorate-containing products. As a federal agency, the Department of Defense, is in a position of influence over the standard-setting process for perchlorate cleanup at the U.S. EPA.

Major Aerospace Contractors and Perchlorate Manufacturers

The Department of Defense and NASA contract out a large amount of aerospace work to companies like Lockheed-Martin. All of these entities have purchased and continue to purchase perchlorate from chemical manufacturers including American Pacific and Kerr-McGee. These contractors and chemical companies have spilled perchlorate at thousands of sites across the nation and are aggressively working to limit their liability. For example, in 2002 Kerr-McGee teamed up with Lockheed-Martin to sue California health authorities over the state's new provisional drinking water standard for perchlorate.[46] The move forced the state to reconsider the standard and significantly delayed the cleanup process.

The Perchlorate Study Group

The Perchlorate Study Group is a collaboration between eight perchlorate manufacturers or users, including Lockheed-Martin, AeroJet, Kerr-McGee Chemical, and American Pacific—all of whom face financial liability for perchlorate cleanup. They supply the Department of Defense, NASA and other entities with perchlorate and perchlorate-containing products. The Perchlorate Study Group funds research into the health effects of perchlorate. However, the results of such research generally are used as public relations material to argue for weak perchlorate standards. Research funded by companies with a financial interest in vindicating their products tends to be less reliable than research without such conflicts of interest.[47]

The Council on Water Quality

A public-relations effort funded by a subset of the member companies of the Perchlorate Study Group. The council is focused on making any potential cleanup standards for perchlorate as weak as possible. The council advocates for cleanup standards more than 200 times higher than recommended by the U.S. EPA—standards that would effectively negate the need for any cleanup to happen at all.

Consultants in Epidemiology and Occupational Health, Inc.

Consultants in Epidemiology and Occupational Health, Inc. is a company that contracts with chemical manufacturers to provide technical support on health issues. Their services include helping clients avoid costs associated with regulation and liability. The organization has worked with the perchlorate manufacturer American Pacific for about 10 years.[48] The group has also worked with other industrial clients, including the American Wood Preservers Institute, an organization that promotes dangerous arsenic-treated wood products used in playgrounds. Dr. Steven H. Lamm is the director of this organization. He is the primary investigator for four of the six studies used by the perchlorate industry when arguing for a weak health standard. His studies regularly conclude that there is no link between low levels of perchlorate and human health impacts, or between thyroid hormone disruptions and neurobehavioral disease.[49]

Exponent, Inc.

Exponent is a scientific consulting firm that, among other services, helps companies navigate the technical aspects of regulation. In some cases, they help clients to dilute cleanup standards or weaken regulations. According to a case study listed under the company's description of risk analysis services, "based on consideration of realistic scenarios of human exposure and chemical migration, Exponent can often demonstrate that substantially higher cleanup goals are more appropriate than the originally proposed cleanup targets."[50] In other words, Exponent can earn its keep by promoting less costly outcomes for companies facing expensive cleanup liability.

TERA—Toxicology and Excellence in Risk Assessment

TERA is another consulting firm that uses the tools of risk assessment to promote less costly outcomes for its corporate clients. Their most recent publication in the perchlorate field argues for a weak perchlorate health standard using an ecological study rejected by the EPA as scientifically flawed and ignoring critical issues to yield a misleading result.[51]

Gradient Corporation

Gradient Corporation is a consulting firm that, like Exponent and TERA, performs risk analyses for corporate clients facing cleanup liabilities or challenges to the unhindered use of chemical products. Gradient has produced analyses of dozens of chemicals, from lead to arsenic, including a risk analysis of ethylene oxide paid for by the Ethylene Oxide Industry Council.[52] Gradient recently published a paper claiming that the rat is "more sensitive than humans" to perchlorate, overlooking major issues that undermine their conclusion.[53] This research was a part of Gradient's testimony in court on behalf of Lockheed-Martin.

Learning Disabilities Are a Serious and Growing Problem in California

The potential for perchlorate to interfere with normal brain development is cause for concern, especially considering that mental health birth defects are a serious and growing problem in California – in particular, learning disabilities like attention deficit hyperactivity disorder (ADHD).

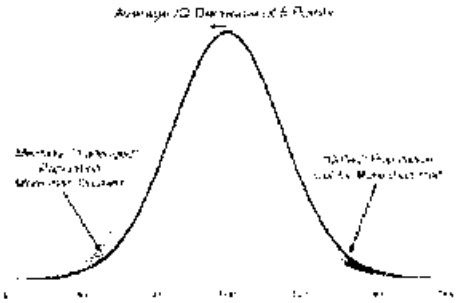
Although perchlorate exposure alone likely cannot explain this trend, it could be making children more vulnerable to other environmental insults, including

Consequences of a Small Shift in Average IQ in California

What would be the significance of a five-point drop in average IQ across California society? It doesn't sound like much, and for the average individual, the loss of five IQ points might not be noticeable. However, a drop in the average IQ across millions of people would lead to a significant loss of intellectual capacity, reduced productivity, and greatly increased needs for special education and related services (Figure 5).

If 35 million people in California have an average IQ of 100, about 800,000 people would be gifted (IQ more than 130), and 800,000 would be mentally challenged (IQ less than 70). However, if the average IQ dropped just five points, the number of gifted people would drop by more than half to 340,000 people, and the number of mentally challenged people would more than double to 1.7 million. Clearly, widespread exposure to a chemical that could impair mental development has profound implications for the overall health and productivity of society.

Figure 5: Consequences of a Society-Wide Reduction in Average Intelligence



toxic flame retardants, pesticides and the well-established culprits of lead, mercury, dioxin, and PCBs.

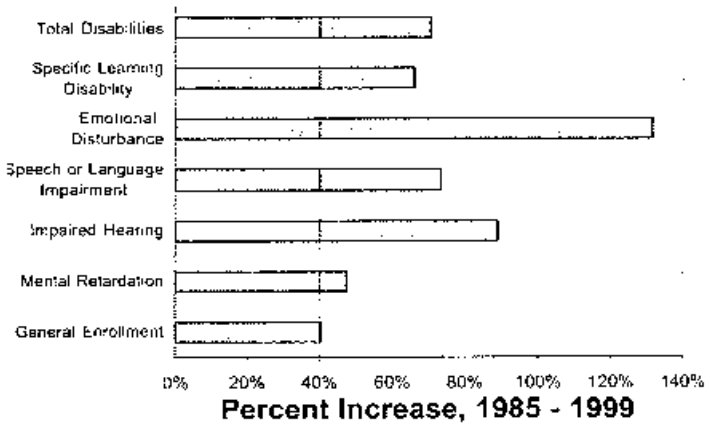
Learning Disabilities Are Growing More Frequent

Learning disabilities have been increasing in California schools. The enrollment of children with specific learning disabilities has increased faster than the general student population during the last two decades (Figure 4). From 1985 to 1999, the number of learning disabled students increased 65 percent faster than the general student population in public schools. Students with learning disabilities now make up roughly six percent of all students in the state.[54] In addition to learning disabilities, enrollment of children with emotional disturbance, speech or language disorders, and hearing impairment increased faster than general enrollment.

No one really knows what is causing these trends. However, there is evidence that exposure to toxic chemicals in the environment could be playing a key role.[56] Chemicals including toxic flame retardants (polybrominated diphenyl ethers or PBDEs), pesticides and the well-established culprits of lead, mercury, dioxin and PCBs all could be causing neurodevelopmental problems in children. In particular, toxic flame retardants, dioxin, and PCBs are all known to affect the thyroid hormone system.[57] These chemicals are bioaccumulative and present in significant amounts in California citizens.[58] The presence of perchlorate in drinking water could be aggravating injury caused by these chemicals, making children more vulnerable to toxicants that disrupt the thyroid system.

Given this context, caution is warranted. The social cost of erring on the wrong side would be considerable. The economic cost of widespread injury to neurological development, even if it represents a societal drop in average IQ of only a few points, would have wide-ranging impacts on the productivity of society (See "Consequences of a Small Shift" on page 21).

Figure 4: Change in Enrollment in California Schools by Type of Disability, 1985-1999[55]



Regulatory Action: Setting a Cleanup Standard That Will Protect Children

The California Department of Health Services (DHS) now faces the task of setting a final standard for perchlorate in drinking water —a standard that will protect expecting mothers, developing fetuses, infants and other vulnerable individuals from harm.

Regulatory action by the state of California to date has been inadequate. In March 2004, The California Environmental Protection Agency (California EPA), the agency charged with identifying a safe level for perchlorate in water, established a public health goal for perchlorate. California EPA set the goal at six parts per billion, six times weaker than recommendations from scientists at the U.S. EPA and the states of Massachusetts, Maryland, and New Mexico. Unofficially, DHS is moving forward with a final drinking water standard equivalent to the public health goal.

A final standard of six parts per billion would be inadequate for several reasons. California EPA chose a single scientific study as the main basis for calculating the public health goal. The study they chose for their calculations, known as the Greer study, looked only at the effect of perchlorate on iodine uptake into the thyroids of healthy adults exposed for a short period of time—while the health goal is meant to protect vulnerable fetuses and infant children exposed to perchlorate over long periods of time. The public health goal applied an atypically small margin of safety and failed to consider how other thyroid toxicants might be adding to the effect of perchlorate, lessening the probability that the standard would actually protect the most vulnerable children. In addition, a final standard of six parts per billion could leave the contamination of the Colorado River and nearly one-third of the polluted wells in California unaddressed.

Recommendations of One Part Per Billion

Scientists at the U.S. EPA and the environmental agencies of Massachusetts, Maryland, and New Mexico have issued recommendations that expectant mothers, infants and children should not be exposed to perchlorate at levels greater than one part per billion in drinking water.

California EPA set the (public health) goal at six parts per billion, six times weaker than recommendations from scientists at the U.S. EPA and the states of Massachusetts, Maryland, and New Mexico.

Health scientists in these agencies looked at the full weight of scientific evidence to determine how much perchlorate is dangerous or causes an unacceptable risk. First, agency scientists looked at experimental data to determine what dose would have no effect on a vulnerable individual. Second, they reduced this dose by a factor designed to ensure that uncertainties in the science today do not cause public health problems in the future. (For example, when establishing a public health goal for diethylhexyl phthalate (DEHP) in drinking water, California EPA applied a safety factor of 1,000 to account for the possibility that humans are more sensitive than experimental animals, the variety in chemical sensitivities among people, and the serious and irreversible problems DEHP could cause for human development and reproduction.)

The U.S. EPA

Based on evidence available in the late 1990s, the EPA developed an initial recommended maximum for perchlorate of 18 parts per billion.[59] However, as more evidence became available, especially studies of the effects of perchlorate on pregnant rats and their pups, the EPA revised its recommendation downward to one part per billion in 2002.[59]

The EPA based its determination on:

- Laboratory data showing that rats exposed *in utero* to perchlorate at levels as low as 10 micrograms per kilogram body weight per day show changes in thyroid hormone levels and thyroid gland structure associated with measurable changes in brain structure and behavior patterns.[61]
- Experiments with healthy people showing that humans were as sensitive as rats to iodine uptake inhibition by perchlorate, with uptake measurably impaired at doses as small as seven micrograms per kilogram body weight per day.

With the application of a margin of safety to ensure that exposure levels would not pose a threat to vulnerable individuals and to account for remaining scientific uncertainty, the EPA developed a one part per billion perchlorate recommendation. With the application of factors to account for the possibility of ingesting perchlorate through the diet, the agency noted it could support a maximum contaminant level as low as 0.2 to 0.8 ppb in water.

The State of Massachusetts

As soon as perchlorate was discovered in drinking water sources in Massachusetts, the state Department of Environmental Protection began work on its own public health guideline for the maximum allowable level of perchlorate in drinking water. State scientists evaluated the entire body of available data on perchlorate toxicity, including results from studies on biological responses to perchlorate in animals and the effects of perchlorate on the developing fetus and nursing newborn. Based on this evidence, and accounting for uncertainties in the science, the scientists recommended that drinking water contain no more than one part per billion perchlorate to protect all members of the population from harm.[62] Their work was extensively peer-reviewed by qualified experts and released in May 2004.

Although Massachusetts scientists used slightly different assumptions and methods from the EPA scientists, they reached a similar conclusion.

California's Public Health Goal: Six Times Weaker

Using the same basic set of data, but a narrower approach, the state of California issued a recommendation of six parts per billion, six times weaker than the recommendations of the U.S. EPA and Massachusetts.[61] This recommendation, known as a public health goal, is a preliminary step toward setting an official and legally-binding health standard.

The process used to arrive at the public health goal did not fulfill the intent of the statutes guiding the process. Under California law,

- A public health goal should be set at a level "at which no known or anticipated adverse effects on health occur, with an adequate margin of safety."[62]
- The goal should include consideration of:
  - o Potential additive or interactive effects with other contaminants present in the environment.
  - o The increased vulnerability of "infants, children, pregnant women, the elderly, individuals with a history of serious illness" and other sensitive groups.
  - o The additive effect of additional exposure to the contaminant in food, air, or other sources beyond drinking water.[63]

In deriving the public health goal, California EPA did not rely on the full weight of scientific evidence, set an atypically small margin of safety to protect the most vulnerable people, and failed to consider how other thyroid toxicants in the environment could be increasing vulnerability to perchlorate. As a result, the final public health goal was set at a level that would leave much of the contamination in California unaddressed.

Narrow Consideration of Available Research

California EPA scientists focused primarily on one single study of healthy adult volunteers given perchlorate for a brief period of 14 days, the Greer study. This study involved a relatively small number of people, did not directly address the risk to the most vulnerable populations (expecting mothers, fetuses, and infants), and did not address the possible effects of long-term exposure associated with low-level contamination of drinking water. While studies involving pregnant human volunteers would be ethically intolerable, research involving rats was available as an informative substitute.

Inadequate Margin of Safety to Protect Vulnerable Individuals

California EPA scientists set a smaller margin of safety for perchlorate than warranted by uncertainties in the science, smaller than those typically used in public health goals for other chemicals (Table 2). Only four chemicals of more than 70 with a public health goal have a margin of safety set at 10 or lower—lead, nitrates, fluoride, and perchlorate.[64] Perchlorate is the least studied of the four. A search of the National Library of Medicine shows that 75 times more studies address lead than perchlorate.[65] There are over 32,000 studies on fluoride, and over 19,000 studies on nitrates, while there are just over 2,200 studies that address perchlorate in some way. In addition, perchlorate is the only one of the four which does not have

direct scientific evidence of effects on the most vulnerable human populations.

California EPA used a single safety factor of 10 to account for differences in the sensitivity of individuals to perchlorate. In the case of infants, California EPA used a safety factor of only 3, arguing that only minor perchlorate absorption differences exist between adults and infants. However, limitations in the Greer study, and in general knowledge of how perchlorate affects infants, warranted larger safety factors to ensure protection of vulnerable individuals. Scientists at both the Massachusetts DEP and the U.S. EPA set larger margins of safety to account for limitations in perchlorate science (Table 3). They each chose a safety factor of 300.

California EPA should have accounted for the fact that the Greer study had a very small sample size, and thus was less likely to detect small differences in iodine uptake at the lowest dose levels. Scientists at the U.S. EPA determined that the group given the smallest dose had only one-tenth of the statistical power to detect changes in iodine uptake as the group given the largest dose, making it difficult to conclude that the smallest dose tested had no effect, and also difficult to estimate the variability in sensitivity to perchlorate across the population.[68] To account for this limitation, the U.S. EPA and Massachusetts DEP began with an estimate of a dose expected to have no effect on a healthy individual two-fold lower than the California EPA, and used a safety factor of an additional 10-fold.

California EPA should have used a larger safety factor for infants. California EPA extrapolated data from the Greer study, involving healthy adults, to a level designed to protect infants using an atypically small safety factor. Newborns in particular are likely to be much more vulnerable to perchlorate than adults. They have no thyroid hormone stored in their glands, and thyroid hormone in their blood recycles more quickly than in adults.[71] Infants may also be more sensitive to the effects of perchlorate. And, infants may each have a different sensitivity to perchlorate because of differences in dietary iodine intake or in their genetic makeup. An infant safety factor of three most likely does not account for the full scope of individual variability.

California EPA should have assigned

Table 2: Comparison of Safety Factors Used in Selected California Public Health Goals[68]

Chemical	Safety Factor (Non-Cancer Effects)
Perchlorate (infants)	3
Perchlorate (adults)	10
Lead[69]	3
Fluoride[70]	1
Nitrates[71]	1
1,1-Dichloroethane	1,000
Alachlor	1,000
Atrazine	100
Carbofuran	300
Carbon Tetrachloride	1,000
Chlordane	10,000
Dalapon	300
Dichloromethane	100
Diethylhexylphthalate (DEHP)	1,000
Endrin	100
Ethylene dibromide	1,000
Heptachlor	100 to 1,000
Hexachlorobenzene	1,000
Lindane	1,000
Methoxychlor	1,000
Methyl tertiary butyl ether (MTBE)	10,000
Pentachlorophenol	1,000
Tetrachloroethylene	30 to 100
Toxaphene	1,000
Trichloroethylene	100
Vinyl Chloride	100

a safety factor to account for the possibility of effects at lower exposure levels lasting for a longer period of time. The Greer study examined the effects of short-term perchlorate exposure and did not evaluate longer-term effects, which could be greater or happen at smaller doses. In fact, U.S. EPA scientists evaluated the raw data from the Greer study and noticed that perchlorate effects became greater over time, suggesting that chronic exposure to perchlorate could cause problems at lower levels than heretofore detected.[75]

Finally, California EPA should have assigned a safety factor to account for uncertainty caused by remaining unanswered questions in perchlorate toxicity. Experiments to date have not examined neurodevelopmental outcomes, subtle and time-sensitive changes in thyroid function during development, and other, more direct ways to detect potentially subtle effects of perchlorate exposure. As these questions are answered, the effects of perchlorate may become apparent at lower exposure levels.

In summary, the Massachusetts DEP concluded that "the Greer study results themselves support a lower interim exposure guidance value for sensitive individuals than that adopted by California EPA."[76] If California EPA scientists had applied the margin of safety used in Massachusetts or by the U.S. EPA, they would have arrived at a public health goal of one part per billion or less.[76]

No Consideration of Potentially Additive Effects with Other Contaminants in the Environment

California EPA scientists also failed to consider how perchlorate may add to the ill-effects of other dangerous chemicals that harm the thyroid gland and put infant children at risk of neuro-developmental defects. In particular, California women have measurable amounts of thyroid toxicants like toxic flame retardants (PBDEs), PCBs and dioxin in their bodies. Just as a pregnant woman with iodine

Table 3: Comparison of Safety Factors Used by the U.S. EPA, Massachusetts DEP, and California EPA

Source of Uncertainty	SAFETY FACTOR		
	U.S EPA[77] (Weight of Evidence)	MADEP[78] (Weight of Evidence)	Cal/EPA[79] (Greer Study)
Variability Among People	3	10	10
Short-Term Exposure Study, Not Chronic	3	—	—
Low Statistical Resolution to Detect Effects at Smallest Exposure Level	10	10	—
Extrapolation of Animal Data to Human	—	3	—
Remaining Unanswered Questions in Perchlorate Science	3	—	—
Total Safety Factor	**300**	**300**	**10**

deficiency or hypothyroidism would be more vulnerable to perchlorate, a pregnant woman with potentially dangerous levels of other thyroid toxicants in her body would be more vulnerable to perchlorate. Other contaminants in water, such as nitrates from fertilizer or factory farms, can also block iodine uptake into the thyroid. Other chemicals, including a toxicant found in cigarette smoke, can have a similar effect. Yet the California EPA scientists failed to consider the cumulative effects of these other pollutants. The effects of multiple chemicals that disrupt the function of the thyroid hormone system could simply be additive, or they could be worse in combination with each other than any one alone. Accounting for the possibility of these interactions would require a lower public health goal.

Leaving Contamination Unaddressed

If California implemented a final standard based on the public health goal of six parts per billion, it could allow polluters to leave much contamination unaddressed. Much of the water drawn from the Colorado River would technically require no treatment. If this water continues to serve as irrigation for crops in Southern California, it could expose massive numbers of people to unacceptable levels of perchlorate through their diets. A final standard of six parts per billion would also effectively exclude nearly one-third of the polluted wells in California from the cleanup effort. More than 110 wells have a maximum detected contaminant level of six parts per billion or less and would be left without mandatory cleanup.[80]

Policy Recommendations

The state has an obligation to protect the health of its most vulnerable citizens. The bottom line is that expectant mothers, fetuses and infants should not have to face the threat of perchlorate in their drinking water. Rocket fuel is not a natural part of California's water supply.

The weight of scientific evidence supports a stronger health standard for perchlorate in drinking water than advocated by the perchlorate industry, and stronger than the current public health goal. DHS should help create the healthiest possible conditions for parents to help their children grow into their full potential by setting a standard that is both scientifically supportable and reflective of legal requirements and community values in providing protection for those who need it most.

DHS should immediately establish a health-protective drinking water standard for perchlorate of one part per billion or less, providing an adequate margin of safety for pregnant women, their developing babies and infants. These young and future citizens need our protection and nurturing in order to reach their full potential.

Addressing the problem of perchlorate contimination will require action on the state, local and national level.

California Department of Health Services

- **The California Department of Health Services should set the drinking water standard for perchlorate at one part per billion or less.**

In addition:

Congress

- Congress should re-establish fees for polluting industries under the Superfund program to ensure cleanup funding for sites like the Inland Empire, where some responsible parties have gone bankrupt.
- Congress should hold the Department of Defense liable for cleanup.
- Congress should require the Department of Defense to fund regular testing for perchlorate contamination on its lands, and to respond promptly to requests for information from state and federal environmental agencies—requests the Department of Defense has a history of resisting.

U.S. EPA, California EPA, and Nevada DEP

- State and federal agencies should require American Pacific, Kerr-McGee Chemical and other responsible parties to accelerate clean up of perchlorate contamination currently leaking into the Colorado River.
- California EPA should label perchlorate as hazardous under proposition 65, which would require warnings for perchlorate-contaminated food.

The State of California Attorney General's Office

- The Attorney General's Office should pursue responsible parties to ensure full recovery of cleanup costs.
- The Attorney General's Office should assist local governments and water suppliers in cases against polluters.

Regional Water Quality Control Boards

- Regional Water Quality Control Boards, including the Santa Ana Regional Water Quality Control Board, should require all responsible parties to provide impacted communities with immediate replacement drinking water.

Local Water Utilities

- Local utilities should endorse a one part per billion perchlorate standard to protect customers.
- Local utilities should provide a summary of the health risks of perchlorate exposure in a variety of languages to customers along with water bills.

Notes

1 California Code of Regulations, Health and Safety Code section 116365, part C.

2 The major perchlorate hot-spots are all associated with defense, aerospace, or other major producers and users of the chemical. Some small levels of perchlorate in Texas have appeared in wells not clearly associated with any perchlorate use. The ultimate source of this contamination is still up for debate. Perchlorate does occur naturally in a mineral deposit in Chile. The perchlorate industry often claims that fertilizer made from this mineral deposit could be a significant source of perchlorate contamination. However, analysis by the EPA indicates that the amounts of fertilizer imported and the minimal perchlorate content of the fertilizer make it impossible to conclude that it is a major source of contamination: U.S. Environmental Protection Agency, Office of Research and Development, *Perchlorate Environmental Contamination: Toxicological Review and Risk Characterization (External Review Draft)* Washington, D.C., NCEA-1-0503, 2002.

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Well NC-13 Tests Positive for Perchlorate

SIGNAL
June 9,06

By Kristopher Daams
SIGNAL STAFF WRITER

A water well located near the polluted Whittaker-Bermite site used by the Newhall County Water District has tested positive for trace amounts of perchlorate.

The district's well, dubbed NC-13, tested positive for a slight level of the contaminate after a test was performed to determine the potential for a migration of perchlorate from the 996-acre site to the well about four months ago, officials said.

It's a mix of good news and bad news, said Larry Sievers, a program manager with the U.S. Army Corps of Engineers who has studied local groundwater contamination.

The detection of perchlorate is "well below drinking water standards, but it's fair," Sievers said. "It appears that perchlorate in low concentrations has made it as far as NC-13."

NC-13 sits less than 1,000 feet south of the district's well NC-11, which was shut down about eight years ago due to perchlorate contamination.

Perchlorate is a component of rocket fuel that is linked to problems with the thyroid gland. It has seeped into local groundwater aquifers from decades of munitions manufacturing on the site by Whittaker Corp. NC-13 and NC-11

See WELL, page A5

Well

Continued from page A1

are both located near Oak Ridge and San Fernando roads.

The detection is low enough that "a machine can't even quantify the concentrations," Sievers said.

More data collection is under way, said Steve Cole, the district's general manager.

The levels of perchlorate ranged from a non-detectable level to a high of about 1.9 parts per billion, Cole said. One part per billion is equivalent to a grain of sand in an Olympic-sized swimming pool.

"What it means is that at certain depth-specific intervals it looks like there's some perchlorate and so we need to drill some more monitoring wells," Cole said.

A federal or state drinking water standard for perchlorate does not currently exist, according to the state's Department of Health Services.

The level of 6 parts per billion is deemed as a "notification level" to advise water utilities, and findings above that level prompt measures for public notification.

The detection limit for purposes of reporting is four parts per billion and debate exists about how much of the chemical is dangerous to human health.

Cole said he brought the results to the attention of officials with the county's Department of Health Services, which sets the standards for safe drinking water.

The well will continue to operate, Cole said.

"And so the questions are now how's it traveling there and from where at the site is it coming from," Sievers said.

Follow-up action based on the results will be more testing, Sievers said.

More monitoring wells will be dug at several locations to detect "drawdown" from NC-13 and the monitoring wells.

Drawdown is a pull experienced by one well induced by the pumping of another. Drawdown between two wells means their sources of water are somewhat connected.

"I would say it is a little bit too early to tell," Cole said, when asked about any potential of perchlorate migration away from the polluted site. "But it certainly has everyone's awareness up."

DEPARTMENT OF TRANSPORTATION
DISTRICT 7, OFFICE OF PUBLIC
TRANSPORTATION AND REGIONAL PLANNING
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Flex your power!
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January 30, 2007

Mr. Daniel Fierros
County of Los Angeles,
Department of Regional Planning
320 West Temple Street
Los Angeles, CA 90012

Re: ***Landmark Village (formerly River Village)***
Vesting Tentative Tract Map No. 53108
Draft Environmental Impact Report
IGR/CEQA No. 061131/EA, SCH#2004021002
Vic. LA/126/0.0-5.00, LA-005-PM R53.9

Dear Mr. Fierros:

Thank you for including the California Department of Transportation (Caltrans) in the environmental review process for the Draft Environmental Impact Report prepared for the Landmark Village development project. Landmark Village is the first subdivision tract map development of the Newhall Ranch Specific Plan. The Landmark Village Tract Map proposes construction of 1,444 residential dwelling units, 1.033 million square feet of mixed-use/commercial uses, an elementary school, and recreational facilities. This comment letter dated January 30, 2007, containing minor revisions, supersedes our previous letter, which was transmitted by FAX on January 22, 2007. We have reviewed document and have the following comments:

State Route 126

The traffic analysis determined the proposed development would result in significant transportation impacts to the following intersections at State highway 126 (SR-126): Long Canyon Road-Chiquito Canyon Road, Walcott Way, and Commerce Center Drive. We note that mitigation measures are recommended to reduce the impacts at all of these intersections to a level less than significant. Project related transportation impacts to the SR-126/I-5 Interchange have been mitigated to a less than significant level by the recently completed widening reconstruction of the SR-126 bridge over-crossing. Planned improvements to the Commerce Center Drive interchange and widening of SR-126 from I-5 to Commerce Center Drive are projected to be completed by 2008. **To avoid significant transportation impacts, we request completion of planned improvements prior to or concurrently with build-out of Landmark Village.** If not, significant transportation impacts would be expected at these locations, and they would need to be addressed in this environmental impact report.

Project Initiation Document (PID)
Typically, the Department (Caltrans) designs transportation improvements to a 20-year horizon, not to 2010 as the study has done. To implement the proposed mitigation measures, a Project Initiation Document (PID) that includes an alternative analysis will be needed and further analysis will be necessary.

Feasibility Study Report
A Feasibility Study Report was prepared by the project's consultant with Caltrans oversight to determine future roadway improvements on State Route 126. The Feasibility Study includes the following recommendations for improvements to SR-126:

- Widening of SR-126 to four-lanes in each direction from Commerce Center Drive to Long Canyon Road.
- New at-grade, signalized intersection at Walcott Way
- New at-grade, signalized intersection at Long Canyon Road/Chiquito Canyon Road

We note that at buildout of Phase Three (3) of Landmark Village (2010), a third through lane would be required at the Walcott Way and Long Canyon Road intersections. Although the Feasibility Study Report references the widening of SR-126, the Draft EIR does not mention the SR-126 widening. The EIR needs to explicitly state that the project (Newhall Ranch Specific Plan) applicant will fund widening of SR-126 from I-5 to Long Canyon Road.

Transportation/Traffic Mitigation Plan
We recommend that Transportation/Traffic Mitigation Plan be prepared detailing all project related mitigation measures for all phases of the project, including improvements to SR-126 and to Interstate 5. It needs to state that the applicant (Newhall Land and Farm) will be responsible for fully funding traffic mitigation to SR-126 including the widening of mainline through lanes, timely with development. We acknowledge that the applicant may seek other sources of funding. Section SP 4.8-7 of the document states: " Construction or funding of any required facilities shall not preclude the applicant's ability to seek state, federal, or local funding for these facilities." However, if the project's efforts to secure state, federal or local funding are unsuccessful, the developer is still responsible to fund the improvements. The mitigation plan needs to be **consistent** with the feasibility study report, and link improvements identified in the feasibility study report with future subdivision maps or phases of Newhall Ranch Specific Plan.
The Transportation/Mitigation Plan needs to describe the "triggers" for initiation of specific mitigation measures, tied to both the project phases, the number of units built, and/or other parameters. We recommend that the Transportation/Traffic Mitigation Plan be included as part of the Final Environmental Impact Report.

Reserving Right-of-Way
We acknowledge the statement on page 4.7-22, that the development project would construct temporary intersections with SR-126, which would be consistent with the project's planned potential future grade-separated crossings for Long Canyon Road and Walcott Way. We recommend that enough right-of-way be reserved for potential future grade-separated interchanges. The final design for both new access intersections will be determined by a Project Initiation Report that includes an alternative analysis. The pending decision to change highway designation from conventional highway to expressway may also influence the final intersection design and the number of access points as well.

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Captured Vehicle Trips

As stated in our previous comment letter, we request for further clarification as to the assumption of unusually high percentage of captured vehicle trips, 30%. It is conceivable that higher captured trips could be achieved in multi-use development, when it includes affordable housing and retail uses. We remind you that school and office uses will also attract vehicle trips from outside the development as well.

Interstate 5

Regarding transportation impacts to Interstate-5, the traffic/access report does not indicate significant impacts as a result of the buildout of Landmark Village. However, through mitigation measures LV-4.7-21 (as shown in the document), the project applicant has committed to participate in capacity augmentation improvements on a fair-share basis for Interstate 5.

Contingency Mitigation Plan

The 2030 cumulative impact analysis for Interstate5 shown on Table 4.7-30 assumes the addition of a High Occupancy Lane (HOV) in the area. It is true that over the years various studies have recommended the addition of HOV lanes, and truck lanes in the area; however, its construction and completion prior to the buildout of Newhall Ranch is not certain. If capacity augmentation improvements such as HOV lanes, truck lanes, or mixed-flow lanes are not built prior to buildout of Newhall Ranch, significant transportation impacts would occur as a result. We request that alternate traffic mitigation measures and/or a contingency plan based on a no-HOV/truck lanes scenario by 2030 be prepared.

Enhanced Transit Usage & Other Smart-Growth Strategies

We encourage the implementation of Smart-Growth Strategies such as: bikeways, pedestrian walkways, enhanced transit usage, and increased Jobs/Housing Balance.

The document describes the following transit related mitigation measures:

- Landmark Village reserves 8 acres of land in a 35-foot wide strip along the south side of State Route-126 as a future rail corridor right of way.
- Construction of Park-and-Ride lot.
- Community design will include bus stop areas for future public bus services.

In the spirit of partnership, we look forward to continuing to work closely with the County and the project applicant regarding the transportation-related aspects of the project. If you have any questions regarding our comments and recommendations, you may call me at (213) 897-3747 or Elmer Alvarez, the IGR Coordinator, at (213) 897-6696, and refer to record number 060133/EA.

Sincerely,

CHERYL J. POWELL
IGR/CEQA Program Manager
Caltrans, District 7

cc: Scott Morgan, State Clearinghouse
Barry Witler, County of Los Angeles Department of Public Works

"Caltrans improves mobility across California"

D16. Letter from Sierra Club, dated January 30, 2007

Response 1

The comment requests an extension to the comment period for the Draft EIR. Additional time was provided for public review and comment. For further information responsive to the comment, please refer to **Topical Response 3**: Public Review Opportunities. The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not raise an environmental issue, no further response is required.

Response 2

This comment is an introduction to comments that follow. No further response is required.

Response 3

The comment refers to the one-paragraph resolution approved by the Executive Committee of the Sierra Club, Los Angeles Chapter, which is attached to the comment letter. The resolution states that "[t]he Angeles Chapter opposes additional land use approvals in Santa Clarita that rely on water from the contaminated Saugus aquifer until clean up facilities to remove the ammonium perchlorate, NDMA and other pollutants from this groundwater source are functioning." The comment also states one of the reasons why Sierra Club approved the resolution. The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not question the adequacy or content of the Draft EIR, no further response is required.

Response 4

The comment expresses concerns about the status and timing of perchlorate clean-up efforts from the local groundwater basin. For responsive information, please see **Topical Response 1**: Perchlorate Treatment Update.

Response 5

Please see **Response 4**, above.

Response 6

The comment identifies another reason why the Sierra Club approved the resolution referenced in **Response 3**, above. The comment also refers to an attached report prepared by the Environment

California Research & Policy Center entitled, "Perchlorate and Children's Health – A Case for a Strong Clean-up Standard for Rocket Fuel in Drinking Water," March 2005. According to this report, several new developments highlight the need to set a final health standard for perchlorate in drinking water "at one part per billion (ppb) or less." (Report, p. 4) The new development consisted of the National Academy of Sciences' January 2005 report on perchlorate and a report issued by researchers at Texas Tech University. (Id.) Based on that research, the report advocated an aggressive health standard be set by the California Department of Health Services (DHS) in order to protect expecting mothers, their developing fetuses, and their infant children.

Since that report was issued, in September 2006, DHS proposed a primary drinking water standard (also known as a maximum contaminant level, MCL) of 6 ppb. Until the MCL is in place, DHS will continue to use a 6 ppb Notification Level to advise and inform water systems and others, and to protect consumers from perchlorate in drinking water. In terms of health concerns regarding perchlorate, DHS has reported that perchlorate's interference with iodide uptake by the thyroid gland can decrease thyroid hormones, which are needed for pre-natal and post-natal growth and development, as well as for normal metabolism and mental function in the adult. To address health concerns, the Office of Environmental Health Hazard Assessment (OEHHA) established a 6 ppb perchlorate public health goal (PHG) in March 2004. OEHHA's PHGs represent the concentration in drinking water that does not pose any significant risk to health. Subsequently, OEHHA reviewed the National Academy of Sciences' 2005 report on perchlorate and determined that no revision to the PHG was required.[22]

Response 7

The comment states that the County approved the Newhall Ranch Specific Plan and, in doing so, recognized the potential for serious impacts to water supply that may arise from the Specific Plan, so it required re-evaluation of the adequacy of the Specific Plan's water supply for each tract map. This misstates the County's actions with respect to approval of the Newhall Ranch Specific Plan in May 2003. Nonetheless, the County has committed to careful assessment of water demand and supply in connection with build-out of the Newhall Ranch Specific Plan.

In addition, the comment states that the Landmark Village Draft EIR, Table 4.10-A, p. 4.10-7, is inaccurate. Table 4.10-A was prepared to evaluate whether adequate and reliable water supplies were available in the Santa Clarita Valley in 2005 to serve the existing population and, if so, would the 2005 supplies have been adequate to also supply water to the Landmark Village project. Based on the data presented, the

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22 The source for this information was the DHS website, last updated May 8, 2007. This website is available for public review and inspection at http://www.dhs.ca.gov/ps/ddwem/chemicals/perchl/default.htm.

Draft EIR concluded that there were adequate and reliable water supplies available in the Santa Clarita Valley in 2005 to serve the existing population, plus the Landmark Village project.

Response 8

As a preface to the response to this comment, it should be noted that the Sierra Club was one of the entities that settled and dismissed its appeal in connection with the prior Newhall Ranch litigation (*United Water Conservation District, et al. v. County of Los Angeles, et al.*, Case No. 239324-RDR [Consolidated with Case Nos. 239325, 239326 and 239327-RDR] 5th Civil No. F044638).[23] In this litigation, Sierra Club and other entities had appealed the order granting a motion brought by the County of Los Angeles and The Newhall Land and Farming Company to discharge the writ of mandate that was previously entered by the trial court. The motion was granted discharging the prior writ, because the Newhall Ranch additional environmental analysis was found to have complied with CEQA.

As part of the settlement effective March 29, 2004, the Sierra Club and other entities acknowledged that the Newhall Ranch Revised Additional Analysis (Volume VIII; May 2003) had disclosed the actual amount of groundwater pumped from the basin to irrigate Newhall's agricultural lands in Los Angeles County. The Sierra Club and other entities also acknowledged that a total of 7,038 acre-feet per year was determined to be the average amount of water used on Newhall's agricultural lands in Los Angeles County from 1996-2000. Further, the Sierra Club and other entities acknowledged that: (a) groundwater historically and presently used for crop irrigation on the Newhall Ranch Specific Plan site and elsewhere in Los Angeles County would be made available by Newhall, or its assignee, to partially meet the potable water demands of the Newhall Ranch Specific Plan; (b) the amount of groundwater pumped for this purpose would not exceed 7,038 acre-feet per year; and (c) pumping this amount would not result in a net increase in groundwater use in the Santa Clarita Valley. The terms of the settlement also required Newhall to monitor, report, and verify its groundwater usage and to provide on-going groundwater-related documentation.

Based upon this settlement, the pending appeal was dismissed, resulting in final resolution of all litigation over the validity or adequacy of the certified Newhall Ranch Specific Plan Program EIR. As a result of this settlement, it is inappropriate for Sierra Club to reargue prior comments and claims concerning the Specific Plan's use of local groundwater to meet its potable water supplies. Nonetheless, the County further responds to the Sierra Club's additional comments below.

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23 The "Notice of Settlement and Dismissal of Appeal" was filed April 1, 2004, is incorporated by this reference, and is available for public inspection and review upon request at Impact Sciences, Inc., 803 Camarillo Springs Road, Suite A-1, Camarillo, California 93012.

The comment states that water supplies are inadequately reported in the Landmark Village Draft EIR because the local groundwater basin is unadjudicated, and, according to the comment, no particular person, landowner, project, or agency has any right to any particular amount of water from the basin. First, it is correct that the local groundwater basin is unadjudicated; this fact has been regularly reported in annual Santa Clarita Valley Water Reports since 1998. Second, under California law, the applicant, as an overlying landowner, has the right to take water from the ground underneath for use on the "overlying" land within the basin or watershed -- the right is based on ownership of the land and is appurtenant to that ownership. The overlying owner, in this case The Newhall Land and Farming Company, is authorized to take such amounts as are reasonably needed for beneficial purposes. (See, e.g., *City of Pasadena v. City of Alhambra* (1949) 33 Cal.2d 908, 925; Cal. Const., art. X, section 2.) The rights of the overlying owner also are generally paramount. (*City of Pasadena*, *supra*, 33 Cal.2d at 927.)

As reported in the Landmark Village Draft EIR, Section 4.10, Water Service, the applicant would meet all of the Landmark Village project's potable water demands by using groundwater pumped from the Alluvial aquifer, which is presently committed to agricultural uses. The amount of water historically and presently available from this source is approximately 7,038 afy. The project's potable water demand is estimated to be 702 afy. No additional water would be pumped, instead, the water presently and historically used to irrigate crops would be pumped from sanitary-sealed municipal supply wells (as compared to open air agricultural wells), treated at the wellhead to meet Title 22 drinking water standards, and then used to meet the project's potable demand, as agricultural areas are taken out of production. The amount of groundwater that will be used to serve the potable demands of the project would not exceed the amount of water historically used for agricultural uses.

Response 9

Please see **Response 8**, above. In addition, the comment refers to CLWA installing wells in the Saugus aquifer. This is believed to be a reference to CLWA's perchlorate remediation efforts; in any case, because the comment does not question the content or adequacy of the Draft EIR, no further response is required.

Response 10

For responsive information, please refer to **Topical Response 1**: Perchlorate Treatment Update.

Response 11

The comment refers to CLWA's existing water banking programs. The comment states that this banked water is not a permanent water supply. The Landmark Village Draft EIR correctly identified the status of these supplies. For example, as to the Semitropic water bank, Table 4.10-8 (note 5) states that such

supplies are the "total amount currently in storage, and would typically be used only during dry years. Once the current storage amount is withdrawn, this supply would no longer be available and, in any event, is not available after 2013."

As to the Rosedale-Rio Bravo water bank, Table 4.10-8 (note 6) states accurately that the total amount of such supplies "can be withdrawn in a given year and would typically be used only during dry years." An accurate description of both programs is also provided in the Landmark Village Draft EIR, Section 4.10, Water Service, at pp. 4.10-50 through 4.10-51. In addition, the 2005 Urban Water Management Plan (UWMP) found in Appendix 4.10 of the Landmark Village Draft EIR further explains these banking programs. Specifically, please refer to the Draft EIR, Appendix 4.10 (2005 UWMP, Section 3.4.2, pp. 3-21–3-24). As to the Rosedale-Rio Bravo banking program, the CLWA environmental documentation, approved by CLWA in October 2005, made it clear that this program was to improve the reliability of CLWA's existing dry year supplies; it was not, and should not be considered, an annual supply that could support growth.

Response 12

Please see **Response 8**, above.

Response 13

Please see **Responses 8**, above.

Response 14

Please see **Topical Response 4**: CLWA's 41,000 AFY Water Transfer; and **Topical Response 5**: Litigation Concerning Water Supplies.

Response 15

The comment refers to the County's Development Monitoring System (DMS), which is addressed in the Landmark Village Draft EIR, Section 3.0, Cumulative Impacts Analysis Methodology, pp. 3.0-2 through 3.0-5. In footnote 1, on p. 3.0-2, the Draft EIR explains the County's DMS as follows:

> "The Los Angeles County General Plan includes provisions known as the 'Development Monitoring System' to give decision makers information about the existing capacity of available public services at the time a new development proposal is considered in the four major Urban Expansion Areas of the Los Angeles County General Plan (Antelope Valley, Santa Clarita Valley, Malibu/Santa Monica Mountains, and East San Gabriel Valley). The goal of DMS is to identify the new public facilities that will be required for

> new development, and to ensure that the appropriate cost of any expansion of facilities will be paid for by that new development, and not assumed by existing taxpayers."

The Draft EIR, at p. 3.0-2, also explained that the County's DMS was further discussed in the Newhall Ranch Specific Plan Program EIR (see Newhall Ranch Revised Draft EIR (March 1999), at Section 2.0, Environmental and Regulatory Setting, pp. 2-18–19.)

In addition, the comment refers to Table 4.10-A from the Landmark Village Draft EIR, and claims that the table is not inclusive enough of DMS projects. In response, Table 4.10-A is not intended to be an analysis of water demand and supply for cumulative impact assessment purposes. Instead, as stated in the Draft EIR at p. 4.10-7, Table 4.10-A is intended to depict existing and other demand as of 2005, plus the Landmark Village water demand. It was specifically intended to answer the question whether there were adequate and reliable water supplies in the Santa Clarita Valley in 2005 to serve the existing population and, if so, would the 2005 supplies have been adequate to also supply water to Landmark Village. Based on the analysis found in Table 4.10-A, the answer to these questions was yes, all of which is discussed in detail in the Draft EIR, Section 4.10, Water Service, p. 4.10-7.

Finally, as to water service, the Landmark Village project relies upon local groundwater supplies to meet the project's potable water demands, and recycled water from the Newhall Ranch WRP to meet the project's non-potable water demands. The Landmark Village project does not rely on CLWA's SWP supplies; and, therefore, does not result in or contribute to any significant cumulative impacts on Santa Clarita Valley's water supplies. Nonetheless, for information purposes, the Landmark Village Draft EIR contains a separate cumulative water demand and supply analysis. This analysis is found in the Draft EIR, Section 4.10, Water Service, Subsection 8, pp. 4.10-73 through 4.10-84. Please see the Landmark Village Draft EIR, Section 4.10, Water Service, Table 4.10-16 for a tabular description of cumulative water demand and supply under the DMS Build-Out Scenario.

Response 16

The comment is noted. No further response is required given that the comment does not address or question the content of the Draft EIR.

Letter No. D17

Wishtoyo

January 31, 2007

Mr. Daniel Fierros
Los Angeles County Department of Regional Planning
320 West Temple Street
Los Angeles, CA 90012

Re: SCH#2004021002 CEQA Notice of Completion: draft Environmental Impact Report for Landmark Village Project No. 00-196 / Tract Map No. 53108 / Landmark Village

Dear Mr. Fierros

Thank you for the opportunity to comment on the DEIR for the proposed Landmark Village Project. We are writing to express our concern regarding the Cultural and Archaeological Resources section of the Draft Environmental Impact Report for the Landmark Project. Native American cultural resources and burials have been documented within the eight cultural/archaeological sites identified by the project consultants W & S Consultants. Yet despite the documented presence of cultural objects and Native American burials, the DEIR in its entirety indicates a complete failure to engage in meaningful tribal consultation, or even appropriate notice to Tribes for whom this area retains cultural importance. This DEIR is written as if Native American people, and the state and federal laws created to protect and preserve cultural resources, do not exist. 1

The Wishtoyo Foundation strongly encourages the LA County Department of Regional Planning to deny project approval unless and until proper consultation with Native American tribes can be successfully established.

Founded in 1997 by Mati Waiya, Chumash member of the Santa Clara River Valley Turtle Clan, Wishtoyo utilizes traditional Chumash beliefs, practices, songs, stories and dances to create a greater awareness of our connection with, and dependence upon, the natural Environment. 2 We understand the importance of renewing and continuing ceremonial practices on traditional tribal lands and support the efforts of Native communities to protect their traditional lands and resources. Given this commitment, we strongly object to this DEIR as it pertains to Native American cultural resources on several grounds: 3

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1. The DEIR is woefully inadequate and must not be approved because it makes the false assertion that the Tataviam Tribal Nation is extinct. Allowing such a blatantly false statement to stand would be profoundly disrespectful to members of the Tataviam Tribe and would be conduct unbecoming of a City. 3

2. The DEIR procedure for unanticipated discovery of human remains is not in compliance with Health and Safety Code §7050.5, Public Resources Code §5097.98 and Sec. §15064.5 (d) of the CEQA Guidelines, which mandate procedures to be followed in the event of an accidental discovery of any human remains in a location other than a dedicated cemetery. 4

3. The DEIR is not in compliance with CEQA Guidelines, Section 15064.5(d), which require the lead agency to work with the Native Americans identified by the Native American Heritage Commission if the initial Study identifies the presence or likely presence of Native American human remains within the APE. 5

4. The DEIR must not be approved because it creates no procedures or plan to assure the appropriate and dignified treatment of Native American remains and any associated grave liens inadvertently disturbed during the course of the project. 6

5. The DEIR proposed mitigation measures are inadequate because they make no attempt to consider appropriate mitigation from a tribal perspective. 7

6. A new cultural resources survey must be conducted using a qualified, unbiased archaeologist, in consultation with a Tataviam monitor. 8

BACKGROUND: SANTA CLARA RIVER AS A CULTURAL NATURAL RESOURCE

Within the River's watershed, tribal members from the Tataviam, Chumash, Kawaiisu, Kitanemuk and Serrano tribal nations continue to harvest natural resources including grasses for basket materials, ceremonial plants and stones, willow plants, sage, tule (cattail) plants, soapstone for making beads, bowls, and ceremonial pipes. The tribes have traditionally used the deer and steelhead as sources of food and trade among the villages that once spanned the length of the watershed. The Santa Clara River is also the crossroads of the Chumash Nation, which extends from Malibu to Morro Bay and from Kern County to the Pacific coast. 9

The River watershed is home to a condor population released by the Chumash Nation fourteen years ago. The condor symbolizes a sacred bond, a lifting of the spirits of the Chumash ancestors. Development that threatens the continued existence of the condor also threatens the sacred relationship between the Chumash and the condor that has existed for thousands of years. Natural open lands, not yet influenced by the impending development, along the River continue to play an important role in the ceremonial and religious practices of tribal members.

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Reburials and naming and healing ceremonies are still conducted along the river and pictographs and rock paintings close by illustrate the historical and cultural importance of the waterway to indigenous peoples. Three traditional cultural sites listed on the state of California's Sacred Lands Inventory maintained by the Native American Heritage Commission are located within one or two miles of the river and the watershed is home to over four hundred known archaeological sites. Tragically, at least sixteen Ancestors have already been disturbed during the course of development projects along the River. The territories that run along the Santa Clara River, including lands within the APE for the Landmark Project, have traditionally been, and continue to be, areas of great cultural, biological, historical and ceremonial significance for many Native American tribes. 9

COMMENTS ON THE INADEQUACY OF THE DRAFT ENVIRONMENTAL IMPACT REPORT FOR THE LANDMARK PROJECT

1. *Significant Native American Cultural Resources and Traditional Cultural Places will be Negatively Impacted by the Proposed Development*

According to California Office of Planning and Research Guidelines for Tribal Consultation, a wide range of places and cultural objects are considered cultural resources under to state law. 10

> Archaeological or historic sites may include places of tribal habitation and activity, in addition to burial grounds or cemeteries. Some examples are village sites and sites with evidence (artifacts) of economic, artistic, or other cultural activity. Religious or ceremonial sites and sacred shrines may include places associated with creation stories or other significant spiritual history, as well as modern day places of worship. Collection or gathering sites are specific places where California Native Americans access certain plants for food, medicine, clothing, ceremonial objects, basket making, and other crafts and uses important to on-going cultural traditions and identities; these places may qualify as religious or ceremonial sites as well as sites that are listed or eligible for listing in the California Register of Historic Resources.[1]

Nearly all of the examples listed above are present at the eight archaeological sites listed as within the APE. Therefore it is likely that Native American cultural resources and traditional cultural places will be significantly impacted by the proposed project unless mitigation measures can be developed in consultation with the Tataviam Tribe. 11

Volume IX Appendices 4.22a-1, 4.22a-2 and 4.22a-3 Intensive Phase I Archaeological Surveys indicate the presence of human burials, cultural objects—including mobile art pieces thought to resemble petroglyphs found in the area, cave sites, evidence of occupation and habitation, and the existence of plants and animals used for food, medicine, tools, clothing, etc in the vicinity of the eight documented archaeological sites. 12

2. *Meaningful Consultation with Tribes is a Necessary Prerequisite to the Development of an Adequate and Culturally Appropriate Mitigation Plan*

[1] Office of Planning and Research, *Tribal Consultation Guidelines: Supplement to the General Plan Guidelines*, November 14, 2005, pp. 3.

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Again, the DEIR prepared for the Landmark project makes no mention of the Native American Tribes for whom the impacted area retains cultural importance. It is impossible to develop appropriate and adequate mitigation measures with respect to Native American cultural resources without first consulting with the communities to whom those resources belong. 13

While unearthing cultural objects for analysis and scientific study, data recovery, placing them in a city or county-run museum and collecting and cataloguing data regarding the resources may qualify as adequate mitigation for archaeological resources, such mitigation measures are inadequate when considered from the tribal perspective. First and foremost, *proper mitigation requires respectful and meaningful consultation with the appropriate tribal members.* No mitigation measures proposed by this DEIR will be adequate unless and until they have been developed in collaboration with the multiple tribal community members for whom these resources are significant. 14

The reliance on a field inspection conducted by a non-tribal member, without the presence of knowledgeable tribal members to aid in identification of traditional cultural places, in an area known to contain at least eight cultural sites, in making their determination that no potentially significant historical resources would be impacted by the project is woefully inadequate, especially when considered in light of the fact that most places which retain cultural importance for Indigenous people are not easily identifiable by non-group members. Furthermore, many places that retain such significance will not be listed on any of the sources consulted during the course of a Phase I records check or even a Phase II field study due to the extremely sensitive nature of such information to tribal peoples. 15

3. *A National Historic Preservation Act Evaluation as a Traditional Cultural Property and a Section 106 Consultation with Indian Tribes will be Required.*

Section 106 of the National Historic Preservation Act ("NHPA") requires any federal agency that has direct or indirect jurisdiction over a federal or federally assisted undertaking, or any federal department or agency that has authority to license an undertaking, to take into account the effect of the undertaking on any site that is included or eligible for listing on the National Register.[2] The federal agency must afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on the effect(s) the undertaking might have on cultural properties. 16

Any project carried out by a federal agency or that requires a federal permit, including a dredge and fill permit under § 404 of the Clean Water Act, would be considered an "undertaking" for purposes of the NHPA. A site on the area where the Permit is issued does not have to be listed on the National Register to trigger Section 106 review by the

[2] An "undertaking" includes any project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a federal agency, including (a) those carried out by or on behalf of an agency; (b) those carried out with federal financial assistance; (c) those requiring a federal permit, license, or approval; and (d) those subject to state or local regulation administered pursuant to a delegation or approval by a federal agency. 16 U.S.C. § 470(w)(7).

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federal agency and the Advisory Council – it only has to be eligible for listing. Thus, any site associated with the cultural practices or beliefs of an Indian community that are rooted in that community's history and important in maintaining the continuing cultural identity of the community must trigger this review.

Section 800.4(b)(1) of the NHPA, 16 U.S.C. § 800.4(b)(1), requires federal agencies to make a reasonable and good faith effort to carry out appropriate identification of historic properties. The appropriate level of effort includes taking into account past planning, research and studies, examining the magnitude and nature of the undertaking and the degree of federal involvement, the nature and extent of potential effects on historic properties and the likely nature and location of historic properties within the area of potential effects. Appropriate identification may include background research, consultation, oral history interviews, sample field investigation, and field survey. 16

Amendments to the NHPA in 1980 directed the Secretary of the Interior to "preserve, conserve, and encourage the continuation of the diverse traditional prehistoric, historic, ethnic, and folk cultural traditions that underlie and are a living expression of our American heritage."[3] As a result of this directive, the NPS issued *Guidelines for Evaluating and Nominating Traditional Cultural Properties*, to assist federal agencies when considering eligibility for the Register as part of the review process prescribed under Section 106 of the NHPA. According to the Guidelines, traditional cultural places are often difficult to recognize by non-group members and, "may not necessarily come to light through the conduct of archeological, historical, or architectural surveys. **The existence and significance of such locations often can be ascertained only through interviews with knowledgeable users of the area**, or through other forms of ethnographic research."[4]

As noted above, the Santa Clara River runs through the traditional land bases of many Indian Nations. Indeed, the beliefs and cultural practices of these tribal Nations are deeply connected to the watershed. Therefore, a NHPA Section 106 Consultation is required before a Permit is issued. Furthermore, as also stated above, areas of traditional cultural importance may not be easily recognizable by non-tribal members. Therefore, any meaningful evaluation for eligibility based on nomination as a Traditional Cultural Property must include, at a minimum, a conversation with the appropriate tribal members to determine the likelihood of such as site. 17

4. *Cumulative Impacts to the Santa Clara River Region Will Have a Detrimental Impact on Tribal Cultural Resources and Traditional Cultural Places.* 18

Thousands of acres of presently undeveloped land have already been impacted by proposed development that takes no account of the cumulative impacts to cultural resources. The Landmark Project is a large development proposal that, when taken in conjunction with other projects along the river, may destroy important cultural places.

[3] NHPA 502; 16 U.S.C. 470a

[4] U.S. Department of the Interior, National Park Service, National Register Bulletin: Guidelines for Evaluating and Documenting Traditional Cultural Properties. Emphasis added.

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5. *Fair Assessment of Cultural Resources Necessitates a New Cultural Resource Study Conducted by a Qualified, Unbiased Archaeologist*

Given Whitley & Simon's blatant disregard for the Tataviam Tribal Nation in their archaeological reports prepared or gathered for the purposes of this DEIR, we believe that a fair assessment of the cultural and archaeological resources located within the APE is impossible to achieve absent an independent archaeological evaluation conducted by an archaeological firm that, at the very minimum, is competent enough to know whether a Tribe exists in the present day. Thus, it is our position that any DEIR, EIR, or other document for public review generated by the City will be grossly inadequate with respect to Native American cultural resources so long as Whitley & Simon are the only archaeological firm evaluating the resources and their importance to present-day tribal members. 19

Additionally, if any burial sites are discovered, the project must immediately be stopped until the Native American Heritage Commission and the appropriate tribally affiliated individuals are contacted and have a chance to evaluate the situation and determine an appropriate course of action. 20

Thank you for the opportunity to present these concerns. We cannot stress enough how important it is that the City adamantly reject the assertion that the Tataviam Tribe is extinct. It is impossible to view the cultural resources section of a DEIR as adequate when the DEIR refuses to acknowledge the continued existence of the tribe with ancestral claim to the lands in question. Please feel free to contact us with any further questions at (310) 678-1747 or (805) 658-1120. 21

Sincerely,

Angela Mooney-D'Arcy
Director, Cultural Resource Programs
Wishtoyo Foundation
(310) 678-1747

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D17. Letter from Wishtoyo Foundation, dated January 31, 2007

Response 1

While cultural resources and burials have been documented within the Santa Clarita Valley and the Specific Plan area, they are not anticipated to be located on the Landmark Village project site.

In addition, the project applicant has entered into an agreement with the Fernandeno Tataviam Band of Mission Indians ("Tataviam") for the establishment of a cultural enrichment program. In summary, the applicant and the Tataviam have agreed to the following program for all of the applicant's properties west of Interstate 5, including the Newhall Ranch Specific Plan, which comprises the Landmark Village project area:

1. Newhall will provide funding to the Tataviam for use in the development of cultural enrichment programs associated with the Tataviam.
2. Newhall will convey to the Tataviam ownership of 1 acre of land located within the proposed Newhall Ranch Homestead Central Neighborhood Park, or an alternative site, for use as a future Native American interpretive/cultural center.
3. Newhall will utilize the Tataviam for all monitoring activities associated with grading and development of Newhall projects to be developed west of the Golden State Freeway/Interstate 5, including Newhall Ranch, Entrada, Legacy Village, and the build-out of the Valencia Commerce Center ("Newhall Projects").
4. The Tataviam will utilize the funding provided by Newhall for cultural enrichment programs, including cultural research, professional consulting, and grant matching related to efforts by the Tataviam to become a federally recognized Native American tribe.
5. The Tataviam will utilize the land conveyed by Newhall to construct an interpretive/cultural center to enhance the activities of the Tataviam, educate the surrounding non-native community, and allow the Tataviam an opportunity to preserve its rich heritage and culture for future generations.
6. In its role as Newhall Projects monitor, the Tataviam will supplement the more general knowledge of scientific experts with its special expertise relating to matters of Native American heritage and interest, and act as a liaison between the Native American community, archaeologists, developers, contractors, and public agencies.

Response 2

The comment provides factual background information that will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not raise an environmental issue regarding the content of the Draft EIR, no further response is required.

Response 3

The Tataviam is not extinct and the archaeological consultants have personally apologized to the Tataviam. The page of the archaeological report that erroneously stated that the Tatavium was extinct has been revised. The requested changes have been made to reflect the Wishtoyo Foundation's comments on the Draft EIR. Please refer to the Final EIR **Section 3.0, Revised Draft EIR Pages**, for the requested revisions.

Response 4

The Health & Safety Code, Public Resources Code, and *CEQA Guidelines* sections referenced in the comment address the issue of human remains, if they are found on the project site. The comment states that the Draft EIR does not incorporate procedures in the event that human remains are found. Mitigation Measure LV 4.22-1 states: "In the event that resources are found during construction, activity shall stop and a qualified archaeologist shall be contacted to evaluate the resources." State law dictates how discovery of human remains are to be treated as noted in Health & Safety Code section 7050.5, Public Resources Code section 5097.98, and *CEQA Guidelines* Section 15064.5(d). Because these procedures are presently state law, and because the law will be followed consistent with the mitigation monitoring program for the project, there is no requirement to include them as mitigation measures.

Response 5

There has been on-going communication with the Tatavium and the project applicant has committed to ongoing Native American monitoring during grading operations. Please see **Response 1** above.

Response 6

Please see **Response 4**, above. See also, Health & Safety Code section 7050.5, Public Resources Code section 5097.98, and Public Resources Code section 15064.5(d)

Response 7

The comment states that mitigation measures are inadequate because they fail to consider appropriate mitigation from a tribal perspective. Pursuant to the *CEQA Guidelines*, a Notice of Preparation was issued on March 1, 2004. The purpose of the Notice of Preparation is to solicit input and comment from agencies and organizations that may be interested in the project. A Notice of Preparation and Initial Study were sent to the Native American Heritage Commission for input and comment. No responses were received from this agency. However, the Native American Heritage Commission submitted a comment letter to the Draft EIR and responses to said letter are found in **Letter A2**, Native American Heritage Commission.

Response 8

Please see **Response 3**, above.

Response 9

The comment provides background information that will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not raise an environmental issue regarding the content of the Draft EIR, no further response is required.

Response 10

The comment provides background information that will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not raise an environmental issue regarding the content of the Draft EIR, no further response is required.

Response 11

The eight archaeological sites mentioned in the comment represent the entire Newhall Ranch Specific Plan site. Two archaeological sites are associated with the Chiquito Canyon grading site and utility corridor proposed with the Landmark Village project site. The Draft EIR, Section 4.22, Cultural/Paleontological Resources, pp. 4.22-10 through 4.22-11, identifies the applicable mitigation measures that would be implemented in conjunction with the project to avoid or mitigate any potential significant impacts to Native American cultural resources.

Response 12

The comment refers to cultural survey appendices that reference the entire Newhall Ranch Specific Plan site. As discussed in the Landmark Village Draft EIR, Section 4.22, Cultural/Paleontological Resources, at p. 4.22-6:

> "No portion of the Landmark Village tract map site would directly or indirectly impact either of the two known archeological sites in the area. However, the Chiquito Canyon grading site and the utility corridor on the south side of SR-126 pass near CA-LAN-2233 and CA-LAN-2234. CA-LAN-2233 was found to contain two components: a northern component containing a subsurface archaeological deposit and intact artifacts; and a southern component consisting solely of a surface scatter of stone artifacts. The northern component contains scientific information that may contribute to the reconstruction of local prehistory. Activity associated with grading in the Chiquito Canyon grading site

> may have a potentially significant indirect impact on the northern site due to its close proximity to this resource.
>
> Phase II fieldwork in the southern portion of CA-LAN-2233 resulted in the recovery of all extant artifacts from this area of the site. This recovery fully mitigates the potentially significant impact that might occur as a result of any land disturbance required for the utility corridor.
>
> Phase II fieldwork at CA-LAN-2234 demonstrated that no intact cultural resources were present at this locale. Accordingly, land disturbance associated with the utility corridor at this locale would not result in significant impacts to cultural resources."

In addition, please see the Landmark Village Draft EIR, Section 4.22, Cultural/Paleontological Resources, at pp. 4.22-10 through 4.22-11, for applicable mitigation measures.

Response 13

Please see **Responses 7** and **11**, above.

Response 14

Please see **Response 7**, above. The Landmark Village Draft EIR includes mitigation measures that would reduce cultural and paleontological impacts to less-than-significant and meet the requirements of CEQA. To determine that, because tribal representatives were not present when mitigation was developed renders them inadequate, is unfounded per the *CEQA Guidelines*.

Response 15

Please see **Response 5**, above, with regard to the presence of Native American monitors on the site during grading activities. In addition, please see **Response 2** to letter **A2** from the Native American Heritage Commission, dated December 26, 2006.

Response 16

The comment states that Section 106 of the National Historic Preservation Act (NHPA) will require consultation with respect to cultural resources important to Native Americans. In response, as stated in the comment, the Section 106 consultation requirement only applies with respect to a federal agency action, undertaking, or permit, and the Landmark Village project is not seeking any such federal actions or permits at this time. As a result, the Section 106 consultation is not yet required. Nonetheless, the applicant is processing the related EIS/EIR project that includes the Newhall Ranch Specific Plan site, and Section 106 consultation is being undertaken in connection with that separate project. For further information responsive to the EIS/EIR project, please refer to **Topical Response 2**: EIS/EIR Project.

Response 17

Communication has been ongoing with the Tataviam Band. Please see **Response 5**, above. In addition, please see **Response 16**, above.

Response 18

The comment states that the Landmark Village project does not take into account cumulative impacts of other projects located along the river. This is not correct. The Draft EIR, Section 4.22, Cultural/ Paleontological Resources, at p. 4.22-12, specifically addresses the cumulative impacts as follows:

> "Impacts upon cultural and paleontological resources tend to be site-specific and are assessed on a site-by-site basis. As discussed above, the Landmark Village study area contains cultural resources. Where these resources exist, implementation of the proposed project would represent an incremental adverse cumulative impact to cultural resources. However, provided that feasible mitigation is implemented by the proposed project, the project is not anticipated to contribute to significant cumulative impacts. Therefore, the project will have less than significant impacts on cultural resources, and such effects would not be cumulatively considerable. In fact, if mitigation is properly carried out, a positive impact on cumulative cultural resource information would occur; that is, mitigation measures would result in the acquisition of additional scientific information about the prehistory of the region, thereby serving to clarify our reconstruction of prehistoric lifeways, while the artifacts obtained from the sites during mitigation procedures would be preserved for future analysis, study, and viewing."

Response 19

The comment states that a new cultural report is needed. The environmental consultant, Impact Sciences, Inc., does not concur with this comment. However, please see **Response 3**, above, for responsive information.

Response 20

Please see **Responses 4**, **5**, and **11**, above.

Response 21

Please see **Response 3**, above, with regard to the existence of the Tatavium. The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project.

Letter No. D18

california water network

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January 31, 2007

Daniel Fierros
Los Angeles County Regional Planning Dept.
320 W. Temple St.
Los Angeles, CA 90012
Fax: (213) 217-5108

Re: Landmark Village DEIR and all entitlements
Please copy to all commissioners

Dear Commissioners:

The California Water Impact Network (C-WIN) again requests that you extend the comment period on this very significant project as we have only had the DEIR since January 19, 2007. 1

We are very concerned about the source and quality of the water being considered and find the DEIR confusing and unclear on this very important subject. 2

The DEIR implies but does not clearly state, that the proposed project "has it's own water supply." Where is this water supply coming from? It is our understanding that the Santa Clara River and the Saugus Aquifer are <u>not adjudicated basins.</u> Therefore, that means that no particular project or water agency or landowner has any "right" to a particular amount of water from those basins. The water from those sources supply all overlying parties on a first come first serve basis; therefore the Newhall Ranch does not "own" that water and can not rely on it for permanent development. 3 4

The ammonium perchlorate present in several of the wells in the basin is very troubling. Ammonium perchlorate is highly carcinogenic and, although there have been promises since 2003 to clean it up, this has not happened to date. 5

Further, the DEIR sites the State Water Project Water Delivery Reliability Report which leads us to conclude that it is possible that this project may be relying on either Table A SWP water probably from the 41,000 acre foot transfer continually counted on by the Castaic Lake Water Agency or on SWP Article 21 water, the so called "surplus" water. Neither of these sources of water is viable for development. The 41,000 AF water transfer is currently being litigated by C-WIN and PCL. The Article 21 water is not a reliable ongoing source of water under any circumstances. 6

Any water coming from the SWP Table A must be judged for reliability taking global warming into consideration. The SWP Water Delivery Reliability Report does not do this. Global warming could very seriously affect the reliability of California's water supply due to more rapidly melting snow pack and less snow fall translating into less water runoff especially when it is most needed in July, August and September. The second major concern brought on by global warming is the potential for ocean level rise and what that could mean to water supplies from northern California coming through the San Francisco-San Joaquin Delta. It is also critical to take assessment of the CalSimII model that has been used to predict the reliability of the SWP Table A water. One of the major faults with the CalSimII model is that it takes groundwater as an unlimited supply; we all know this is not true. 7 8

There has been much proposed development in the Castaic Newhall area over the last few years and given that the water supplies are so critically short, the cumulative impacts of all this proposed development on the water supply must be considered every time there is a new proposal. Piecemeal development is not a safe way to proceed; especially for the people who are already living in the area. 9

C-WIN requests that Landmark Village be denied until there is an adequate, reliable source of safe good quality water. C-WIN hereby incorporates all other comments opposing this project by reference. 10

Sincerely,

Carolee Krieger

Carolee Krieger, President

D18. Letter from California Water Impact Network, dated January 31, 2007

Response 1

The comment requests that the public comment period be extended. Additional time for public review and comment has been provided. For further information, please refer to **Topical Response 3**: Public Review Opportunities.

Response 2

The comment states that the source and quality of the water to serve the Landmark Village project site is "confusing and unclear." County staff re-reviewed the Landmark Village Draft EIR, Section 4.10, Water Service, and does not believe that it is either confusing or unclear. Nonetheless, the comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project.

Response 3

The comment states that the sources of water supply for the Landmark Village project are not clearly stated. For a clear description of the project's water supply sources, please see Section 4.10, Water Service, at pp. 4.10-2 through 4.10-3, and 4.10-69 through 4.10-72. In addition, please refer to the Landmark Village SB 610 Water Supply Assessment, which is found in Appendix 4.10 of the Landmark Village Draft EIR.

Response 4

Please see **Response 8** to letter **D16** from the Sierra Club, dated January 30, 2007.

Response 5

Please see **Topical Response 1**: Perchlorate Treatment Update for information responsive to this comment.

Response 6

Please see **Topical Response 4**: CLWA's 41,000 AFY Water Transfer; and **Topical Response 5**: Litigation Concerning Water Supplies, for information responsive to this comment.

Response 7

Please see **Topical Response 6**: Global Climate Change And Its Effects On California Water Supplies for information responsive to this comment.

Response 8

Please see **Response 6**, above.

Response 9

The comment states that the cumulative impact of all proposed development on the Valley's water supplies must be considered. In response, the Landmark Village Draft EIR, Section 4.10, Water Service, at pp. 4.10-73 through 4.10-84, contains a detailed cumulative water demand and supply analysis, utilizing three separate scenarios. This analysis focuses on the cumulative impacts to water demand and supply in the Santa Clarita Valley. Based on that analysis, the Draft EIR, at p. 4.10-92, concluded because the proposed Landmark Village project has its own independent water supplies, the project does not result in or contribute to any significant unavoidable impacts on Santa Clarita Valley water resources.

No further analysis is required in response to this general comment.

Response 10

The comment is noted. No further response is required given that the comment does not address or question the content of the Draft EIR.

ENV-12

VTTM 53108
01-31-07
Ms Tae / Armenuh

WILD HERITAGE PLANNERS
JACK EIDT
5015 Alamden Drive
Los Angeles, California 90042
Email:
Office Telephone: 323 257 0383

January 31, 2007

Ms. Susan Tae
Los Angeles County Regional Planning Department
320 West Temple
Los Angeles, California 90012

RE: Newhall Ranch, Landmark Village Project, No. 00-196-(5), Tract Map 53108

Dear Ms. Tae:

Wild Heritage Planners (WHP) an organization based in Southern California dedicated to sustainable environmental planning and smart growth, appreciates this opportunity to comment on the EIR for the Landmark Village Project. 1 WHP suggests that the County of Los Angeles consider other alternatives than building 1,400 residential units and one million square feet of commercial/mixed use/office space in the Santa Clara River Significant Ecological Area (SEA). 2 The Santa Clara is the only major wild river left in Southern California and is home to the endangered unarmored threespine stickleback, as well as a source of drinking water and irrigation to communities in the valley. 3 The Newhall Ranch Specific Plan does nothing but compound the unfortunate legacy of urban sprawl that has transformed the oak woodland and fruit orchard-covered hillsides of the region into an LA ex-urb, and turned the Interstate 5 into a smog-filled commuter's parking lot. WHP advocates that as a region we deserve smarter development. 4

The need for new housing and commercial areas is proven. It is, however, incumbent on the decision-makers of the County of Los Angeles to decide where to build and how to manage this incoming population, relative to their impact of the environment. 5 The Environmental Impact Report for Landmark Village identifies degradation to the biological resources of the Santa Clara River SEA, but fails to suggest measures that would mitigate the loss given the endangered nature of the fragile wetland ecosystem. 6 The destruction of 67 oaks is also a significant and irreversible impact of the proposed project with no acceptable mitigation. 7 The FEMA 100- year Floodplain Reservation Option and the Cluster Option are improvements over the proposed project, but still would not create a living environment that could coexist with the sensitive ecology of an endangered river and oak woodland hillsides. 8

New housing should be built in conjunction with land use and transportation solutions that would be sustainable for the long-term given the ever-tightening global oil supplies, and the looming danger from global climate change. 9 While Landmark Village does employ some planning techniques that would minimize locally the impacts from development, on a macro-scale, the project is a small example of a rampant land use conundrum. 10 What is today sensitive greenfield will be transformed into a cluster of automobile dependent uses that will draw traffic trips onto thoroughfares where today there are none, and generate new commuters heading for the San Fernando Valley for work and shopping. 11 The visual blight on the Santa Clara River Valley would be significant and irreversible. 12 Smog forming and cancer-causing chemicals would be manifested in areas where there are none today. Runoff from the development would spill into the still-pristine river waters, poisoning an ecosystem that provides water for birds and mammals from the Los Padres and Angeles National Forests and sustains the communities of Piru, Santa Paula, Fillmore, and Ventura. 13 LA County must consider the cumulative effect of this destructive form of development, and suggest alternatives that would spare us this fate. 14

The Landmark Village 1,400 units and one million square feet of commercial should be integrated into the fabric of an existing urban area with already-established infrastructure and access to mass transit, shopping areas, and an employment base. 15 No alternative is provided in the EIR document that deals with this question. Therefore the project should be considered deficient and rejected. 16

WHP would hope that the County would grant an additional 120 days for communities and local organizations to further review the environmental documents to formulate a more significant alternative to this destructive proposal. 17

Sincerely,

Jack Eidt
Director of Planning
Wild Heritage Planners
5015 Almaden Drive
Los Angeles, CA 90042

D19. Letter from Wild Heritage Planners, dated January 31, 2007

Response 1

This comment is an introduction to comments that follow. No further response is required.

Response 2

The comment suggests that the County consider alternatives other than building the proposed project "in the Santa Clara River Significant Ecological Area (SEA)." No residential or commercial development is proposed within the River Corridor SMA/SEA 23.

Response 3

The comment restates information concerning the Santa Clara River, which received extensive analysis in the Landmark Village Draft EIR, Section 4.10, Water Service; however, the comment does not raise an environmental issue within the meaning of CEQA. The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not raise an environmental issue regarding the content of the Draft EIR, no further response is required.

Response 4

The comment expresses the opinions of Wild Heritage Planners. The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not address or question the content of the Draft EIR, no further response is required.

Response 5

The comment acknowledges the need for housing and commercial areas; however, the comment states that decision makers must know where to build and how to manage incoming population relative to impacts on the environment. In May 2003, the County's Board of Supervisors certified the Newhall Ranch Specific Plan Program EIR as adequate under CEQA, and approved the Newhall Ranch Specific Plan and related project approvals. The Specific Plan Program EIR identified and analyzed the existing conditions, potential impacts, and mitigation measures associated with development of the entire Newhall Ranch Specific Plan. The proposed Landmark Village project is located within the Riverwood Village area of the approved Specific Plan. This EIR has been prepared at a project-level and tiers from the previously-certified Specific Plan Program EIR.

Response 6

The comment is unclear regarding the Landmark Village Draft EIR's "failure" to identify mitigation measures that would avoid or substantially lessen impacts to sensitive biological resources in the Santa Clara River. The Landmark Village Draft EIR concludes that the proposed riparian setback/buffer is sufficient to maintain the function and values of the adjacent riparian habitat, and to protect the diversity of riparian-associated wildlife species occurring within these areas. This finding is consistent with the findings of the Newhall Ranch Specific Plan Program EIR that concluded the proposed Newhall Ranch Land Use Plan and other design features were sufficient to maintain the function and values of the riparian habitat in the River Corridor SMA/SEA 23. The following is one example taken from the Landmark Village Draft EIR to demonstrate that the document does adequately identify mitigation measures to off-set impacts to the River.

SIGNIFICANT IMPACT: Loss of Riparian Plant and/or Sensitive Plant Communities (i.e., Mulefat Scrub, Southern Willow Scrub, Southern Cottonwood Willow Riparian Forest, Valley Freshwater Marsh, Scalebroom Scrub)

Previously Incorporated Measures (from approved Specific Plan EIR)

Mitigation through Restoration

4.6-1 The restoration mitigation areas located within the River Corridor SMA shall be in areas that have been disturbed by previous uses or activities. Mitigation shall be conducted only on sites where soils, hydrology, and microclimate conditions are suitable for riparian habitat. First priority will be given to those restorable areas that occur adjacent to existing patches (areas) of native habitat that support sensitive species, particularly Endangered or Threatened species. The goal is to increase habitat patch size and connectivity with other existing habitat patches while restoring habitat values that will benefit sensitive species.

4.6-2 A qualified biologist shall prepare or review revegetation plans. The biologist shall also monitor the restoration effort from its inception through the establishment phase.

4.6-3 Revegetation Plans may be prepared as part of a California Department of Fish and Game 1603 Streambed Alteration Agreement and/or an U.S. Army Corps of Engineers Section 404 Permit, and shall include:

- Input from both the Project proponent and resource agencies to assure that the Project objectives applicable to the River Corridor SMA and the criteria of this RMP are met.
- The identification of restoration/mitigation sites to be used. This effort shall involve an analysis of the suitability of potential sites to support the desired habitat, including a description of the existing conditions at the site(s) and such base line data information deemed necessary by the permitting agency.

4.6-4 The revegetation effort shall involve an analysis of the site conditions such as soils and hydrology so that site preparation needs can be evaluated. The revegetation plan shall include the details and procedures required to prepare the restoration site for planting (i.e., grading, soil preparation, soil stockpiling, soil amendments, etc.), including the need for a supplemental irrigation system, if any.

4.6-5 Restoration of riparian habitats within the River Corridor SMA shall use plant species native to the Santa Clara River. Cuttings or seeds of native plants shall be gathered within the River Corridor SMA or purchased from nurseries with local supplies to provide good genetic stock for the replacement habitats. Plant species used in the restoration of riparian habitat shall be listed on the approved project plant palette (Specific Plan Table 2.6-1, Recommended Plant Species for Habitat Restoration in the River Corridor SMA) or as approved by the permitting state and federal agencies.

4.6-6 The final revegetation plans shall include notes that outline the methods and procedures for the installation of the plant materials. Plant protection measures identified by the project biologist shall be incorporated into the planting design/layout.

4.6-7 The revegetation plan shall include guidelines for the maintenance of the mitigation site during the establishment phase of the plantings. The maintenance program shall contain guidelines for the control of non-native plant species, the maintenance of the irrigation system, and the replacement of plant species.

4.6-8 The revegetation plan shall provide for monitoring to evaluate the growth of the developing habitat. Specific performance goals for the restored habitat shall be defined by qualitative and quantitative characteristics of similar habitats on the river (e.g., density, cover, species composition, structural development). The monitoring effort shall include an evaluation of not only the plant material installed, but the use of the site by wildlife. The length of the monitoring period shall be determined by the permitting state and/or federal agency.

4.6-9 Monitoring reports for the mitigation site shall be reviewed by the permitting state and/or federal agency.

4.6-10 Contingency plans and appropriate remedial measures shall also be outlined in the revegetation plan.

Mitigation through Enhancement

4.6-11 Habitat enhancement as referred to in this document means the rehabilitation of areas of native habitat that have been moderately disturbed by past activities (e.g., grazing, roads, oil and natural gas operations, etc.) or have been invaded by non-native plant species such as giant cane (*Arundo donax*) and tamarisk (*Tamarix* sp.).

4.6-12 Removal of grazing is an important means of enhancement of habitat values. Without ongoing disturbance from cattle, many riparian areas will recover naturally. Grazing except as permitted as a long-term resource management activity will be removed from the River Corridor SMA pursuant to the Long-Term Management Plan set forth in Section 4.6 of the Specific Plan EIR.

4.6-13 To provide guidelines for the installation of supplemental plantings of native species within enhancement areas, a revegetation plan shall be prepared prior to implementation of mitigation (see guidelines for revegetation plans above). These supplemental plantings will be composed of plant species similar to those growing in the existing habitat patch (see Specific Plan Table 2.6-1).

4.6-14 Not all enhancement areas will necessarily require supplemental plantings of native species. Some areas may support conditions conducive for rapid "natural" reestablishment of native species. The revegetation plan may incorporate means of enhancement to areas of compacted soils, poor soil fertility, trash or flood debris, and roads as a way of enhancing riparian habitat values.

4.6-15 Removal of non-native species such as giant cane (*Arundo donax*), salt cedar or tamarisk (*Tamarix* sp.), tree tobacco (*Nicotiana glauca*), castor bean (*Ricans communis*), if included in a revegetation plan to mitigate impacts, shall be subject to the following standards:

- First priority shall be given to those habitat patches that support or have a high potential for supporting sensitive species, particularly Endangered or Threatened species.
- All non-native species removals shall be conducted according to a resource agency approved exotics removal program.
- Removal of non-native species in patches of native habitat shall be conducted in such a way as to minimize impacts to the existing native riparian plant species.

Mitigation Banking

4.6-16 Mitigation banking activities for riparian habitats will be subject to state and federal regulations and permits. Mitigation banking for oak resources shall be conducted pursuant to the Oak Resources Replacement Program. Mitigation banking for elderberry scrub shall be subject to approval of plans by the County Forester.

Grading Activities Long-Term Management Plan (Conservation Easement)

4.6-21 Upon final approval of the Newhall Ranch Specific Plan, the Special Management Area designation for the River Corridor SMA shall become effective. The permitted uses and development standards for the SMA are governed by the Development Regulations, Chapter 3 of the Specific Plan.

4.6-22 Upon completion of development of all land uses, utilities, roads, flood control improvements, bridges, trails, and other improvements necessary for implementation of the Specific Plan within the River Corridor in each subdivision allowing construction within or adjacent to the River Corridor, a permanent, non-revocable Conservation and Public Access Easement shall be offered to the County of Los Angeles pursuant to Mitigation Measure 4.6-23, below, over the portion of the River Corridor SMA within that subdivision.

4.6-23 The River Corridor SMA Conservation and Public Access Easement shall be offered to the County of Los Angeles prior to the transfer of the River Corridor SMA ownership, or portion thereof to the management entity described in Mitigation Measure 4.6-26, below.

4.6-24 The River Corridor SMA Conservation and Public Access Easement shall prohibit grazing, except as a long-term resource management activity, and agriculture within the River Corridor and shall restrict recreation use to the established trail system.

Agricultural land uses and grazing for purposes other than long-term resource management activities within the River Corridor shall be extended in the event of the filing of any legal action against Los Angeles County challenging final approval of the Newhall Ranch Specific Plan and any related project approvals or certification of the Final EIR for Newhall Ranch. Agricultural land uses and grazing for purposes other than long-term resource management activities within the River Corridor shall be extended by the time period between the filing of any such legal action and the entry of a final judgment by a court with appropriate jurisdiction, after exhausting all rights of appeal, or execution of a final settlement agreement between all parties to the legal action, whichever occurs first.

4.6-25 The River Corridor SMA conservation and public access easement shall be consistent in its provisions with any other conservation easements to state or federal resource agencies that may have been granted as part of mitigation or mitigation banking activities.

4.6-26 Prior to the recordation of the River Corridor SMA *Conservation and Public Access Easement* as specified in Mitigation Measure 4.6-23, above, the land owner shall provide a plan to the County for the permanent ownership and management of the River Corridor SMA, including any necessary financing. This plan shall include the transfer of ownership of the River Corridor SMA to the Center for Natural Lands Management, or if the Center for Natural Lands Management is declared bankrupt or dissolved, ownership will transfer or revert to a *joint powers authority* consisting of Los Angeles County (4 members), the City of Santa Clarita (2 members), and the Santa Monica Mountains Conservancy (2 members).

4.6-27 Removal of grazing from the High Country SMA except for those grazing activities associated with long-term resource management programs, is a principal means of enhancing habitat values in the creeks, brushland, and woodland areas of the SMA. The removal of grazing in the High Country SMA is discussed below under (b) 4. Long-Term Management. All enhancement activities for riparian habitat within the High Country SMA shall be governed by the same provisions as set forth for enhancement in the River Corridor SMA. Specific Plan Table 2.6-3 of the Resource Management Plan provides a list of appropriate plant species for use in enhancement areas in the High Country SMA.

4.6-63 Riparian resources that are impacted by build out of the Newhall Ranch Specific Plan shall be restored with similar habitat at the rate of 1 acre replaced for each acre lost.

Measures Recommended by EIR

LV 4.4-1 The riparian revegetation plan to be developed by the applicant shall Measure 4.6-63). The plan shall specify, at a minimum, the following: (1) the location of mitigation sites; (2) the quantity and species of plants to be planted; (3) procedures for creating additional habitat; (4) methods for the removal of non-native plants; (5) a schedule and action plan to maintain and monitor the enhancement/restoration area; (6) a list of criteria and performance standards by which to measure success of the mitigation sites; (7) measures to exclude unauthorized entry into the riparian creation/enhancement areas; and (8) contingency measures in the event that mitigation efforts are not successful. The plan shall also provide

for the 1:1 replacement of any Southern California black walnut to be removed from the riparian corridor. The plan shall be subject to the approval of CDFG, ACOE, and the County, and approved prior to issuance of the grading permit.

For each significant impact to River-associated biological resources, the Landmark Village Draft EIR provides mitigation measures to reduce such impacts.

Response 7

The comment states that impacts to 67 oaks is significant and irreversible, with no acceptable mitigation. The Landmark Village project is a component of the greater Newhall Ranch Specific Plan. The Specific Plan guides the long-term development of the 11,963-acre Newhall Ranch community and includes the preservation of large areas of open space. In the preliminary planning phases, large contiguous areas of wildlife habitat (including oak woodlands) were designated for protection and to facilitate mitigation at the project-level. This is evidenced by the fact that approximately 16,000 oak trees, of a total 20,000 oak trees, are located in areas that will be preserved in perpetuity (Newhall Ranch High Country SMA/SEA 20 and the Salt Creek area). Additionally, the preservation of the River Corridor SMA/SEA 23 and the High Country SMA/SEA 20 would protect approximately 585 acres of oak woodland and 300 acres of oak savannah in perpetuity. The preservation of the Salt Creek area would protect approximately 266 acres of oak woodland and 113 acres of oak savannah in perpetuity. In total, conservation easements would be placed over 851 acres of oak woodland and 413 acres of oak savannah (including the River Corridor SMA/SEA 23, the High Country SMA/SEA 20, and the Salt Creek area). The preservation of this oak woodland habitat, as well as the implementation of Mitigation Measure LV 4.4-4 in the Final EIR) would comply with the County Oak Tree Ordinance and the requirements of Public Resources Code section 21083.4, and would mitigate the project impacts to a less-than-significant level. Mitigation Measure LV 4.4-4 has been revised to require that the replacement of oak trees be in-kind.

Response 8

The comment states that the floodplain and cluster alternatives area an improvement over the proposed project but would, nonetheless, not provide an environment that could co-exist with associated sensitive ecology. The comment expresses the opinions of Wild Heritage Planners. The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not address or question the content of the Draft EIR, no further response is required.

Response 9

Please see **Topical Response 6**: Global Climate Change And Its Effects On California Water Supplies; **Topical Response 7**: Global Climate Change And Its Effects On Sensitive Biological Resources; and **Topical Response 8**: Greenhouse Gas Emissions And Global Climate Change.

Response 10

Please see **Response 4**, above.

Response 11

Please see **Response 4**, above.

Response 12

The comment states that the "visual blight" on the Santa Clara River Valley would be significant and irreversible. In response, the Landmark Village Draft EIR, Section 4.6, Visual Qualities, contains an extensive analysis of the project's potentially significant impacts on the visual characteristics of the Santa Clara River/SR-126 corridor. Based on that analysis, the Draft EIR, at p. 4.6-25, concluded that project and cumulative development would significantly alter the visual characteristics of the Santa Clara River/SR-126 corridor through the introduction of residential, commercial, and institutional uses on land presently cultivated with crops. In addition, the Draft EIR reported that the earthwork necessary for site development would significantly alter hillsides and ridgelines, which form prominent visual features within the Santa Clara River/SR-126 corridor and that these impacts remain significant and unavoidable. These findings are consistent with the findings made by the County's Board of Supervisors in certifying the Newhall Ranch Specific Plan Program EIR.

Response 13

The comment expresses an opinion. The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not address or question the content of the Draft EIR, no further response is required.

Response 14

The comment states that the County must consider the cumulative effect of the Newhall Ranch Specific Plan development (including Landmark Village). The requested analysis is found in the previously certified Newhall Ranch Specific Plan Program EIR. For further information responsive to this request, please see below.

Dudek prepared a Santa Clara River Watershed Study (Dudek 2007) to analyze the cumulative impacts of development, including past projects, current land use zoning, and future and approved projects in the Los Angeles County portion of the watershed, to biological and abiotic resources and ecological functions and processes in the watershed. While land conversion, in the form of agriculture, residential, commercial, and industrial urban uses has occurred in the Santa Clara River Valley and adjacent foothills, and future development will occur, the vast majority of the watershed is comprised of natural lands. The additional impacts of the Landmark Village project, Newhall Land and Farming projects in general, and other planned and approved projects in the Los Angeles County portion of the watershed are relatively small in proportion to the overall watershed. Key findings of the Dudek watershed study include:

- The watershed is, and will remain, for the most part undeveloped – lands converted to agriculture and urban development comprise about 10 percent of the total watershed. Planned and approved projects in Los Angeles County (including the City of Santa Clarita) would increase the amount of development in the watershed by about 3 percent.

- The watershed has very substantial existing public lands and planned open spaces that will be protected in perpetuity. Based on current public lands and currently zoned open space, approximately 71 percent of the watershed (733,526 acres) is existing or zoned open space.

- Under current land use zoning important biological and physical features of the overall watershed would be retained. The major vegetation communities (coastal scrubs, chaparral, non-native grassland, woodlands and forest, and riparian/wetlands) are still and will remain relatively common in the watershed.

- Newhall lands are a very small proportion (<2%) of the overall watershed and are limited to a small area in the southern portion of the watershed. Planned development on Newhall property (including the Landmark Village project) would impact only 1 percent of the total watershed and would be 26 percent less than the amount of development allowed on Newhall lands under the current land use zoning.

- Planned development on Newhall property is downstream of substantial existing, planned, and approved urban land uses in Santa Clarita and Valencia and occurs in the lower elevation areas of the watershed, thus protecting headwaters and upper portions of sub-basins within the watershed and the functions and values these sub-basins provide.

- Regional wildlife corridors and habitat linkages will be preserved in the watershed.

In short, the comment overstates the level of cumulative impacts to the watershed as a whole. Encroachment by past development (including agriculture) has caused habitat loss and fragmentation; however, the Santa Clara River is still considered a natural river system and still provides habitat for several listed, threatened, or endangered species such as the least Bell's vireo, southwestern willow flycatcher, unarmored threespine stickleback, and arroyo toad, as well as a number of non-listed special-status species. In acknowledging the importance of protecting the River corridor and its resources from

future development impacts, the Valencia Company (a division of The Newhall Land and Farming Company) prepared the Natural River Management Plan (NRMP), which is a long-range management plan to protect the Santa Clara River and maintain its natural functions within Newhall lands between its confluence with Castaic Junction on the west end to one-half mile upstream of the Los Angeles Aqueduct and portions of San Francisquito Creek and the South Fork of the Santa Clara River. For the Specific Plan lands west of this reach, the project applicant has prepared the Specific Plan's Resource Management Plan (RMP) (Section 2.6 of the Specific Plan) that was approved by the County Board of Supervisors in 2003 and which, as the initial framework for resource management, set forth conceptual mitigation and management standards for sensitive biological resources within the boundary of the Specific Plan. A similar project-level plan is being prepared for the proposed Newhall Ranch Resource Management and Development Plan. This plan will guide future resource conservation, mitigation, and permitting by the Corps and CDFG for the long-term management of sensitive biological resources in conjunction with the infrastructure improvements and facilities approved under the Newhall Ranch Specific Plan.

The comment also states that "cumulative impacts are not adequately addressed in the DEIR." The Landmark Village Draft EIR, Section 3.0, discusses approved, proposed, and reasonably foreseeable future projects, including other project components of the Newhall Ranch Specific Plan, Mission Village and Homestead. Twenty-two additional related projects that support or would potentially affect similar plant communities, jurisdictional resources, and special-status plant and animal species also were analyzed. These projects include the Valencia Commerce Center, West Creek project, Entrada, Tesoro de Valle (Upper San Francisquito Creek), Cross Valley Connector (Newhall Ranch Road including the Newhall Ranch Road/Golden Valley Road Bridge), North Valencia Specific Plan No. I (Industrial Park), North Valencia Specific Plan No. II, Riverpark, Bouquet Canyon Bridge Widening, Whittaker–Bermite (Porta Bella Project), Synergy Project, Tick Canyon, Bee Canyon, Tract 42760, Fair Oaks Ranch, Santa Clara River Enhancement and Management Plan, Gate King project, Transit Mix Soledad Canyon Mine, Los Angeles County Sanitation District's Facilities Plan, Castaic Lake Water Agency Reclaimed Water Master Plan, Castaic Junction, and the Newhall Ranch Resource Management and Development Plan/Spineflower Conservation Plan.

The comment also cites a statement in the USFWS "Biological Opinion for the Valencia Company's Clean Water Act Section 404 Authorization for Portions of the Santa Clara River, Los Angeles County, California" regarding impacts to the Santa Clara River and listed species, followed by the statement that after 10 years, "massive projects" continue to impact the river. No factual support is provided to support the claim. Nonetheless, on the basis of these claims, the comment asserts that "[t]he DEIR must completely reexamine cumulative impacts of the Santa Clara watershed impacts and evaluate effectiveness of mitigation for these impacts." As discussed above, the Dudek Draft Watershed Study has

compiled projects and associated impacts in the watershed, and has concluded that the development proposed in the watershed will not significantly impact biological resources.

Response 15

The comment states that the Landmark Village project "should be integrated into the fabric of an existing urban area with already established infrastructure and access to mass transit, shopping areas, and an employment base." The comment is confusing because, while the Landmark Village project site is in close proximity to existing infrastructure and an established employment base, site development nonetheless requires the characteristics of the site to change from primarily agriculture to urban uses. In addition, the comment states that "no alternative" is provided in the EIR "that deals with this question." Again, however, the comment is unclear. There is an extensive analysis of alternatives to the proposed project in the Landmark Village Draft EIR, Section 5.0, Project Alternatives, pp. 5.0-1 through 5.0-35. The alternatives analysis includes the CEQA-required "no project" alternative. To the extent that the comment is requesting that the Landmark Village project site not be developed in this particular area, but rather as an "in-fill" project in another area, then the "no project" alternative addresses the comment's request for that alternatives analysis.

Response 16

The comment expresses an opinion. The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not address or question the content of the Draft EIR, no further response is required.

Response 17

The comment requests that the public comment period be extended. Additional time for public review and comment has been provided. For further information, please refer to **Topical Response 3**: Public Review Opportunities.

Letter No. D20

California Native Plant Society

February 19, 2007

ENV-20

Mr. Daniel Fierros
County of Los Angeles Regional Planning Department
Impact Analysis Section
320 West Temple Street, Room 1348
Los Angeles CA 90012
dfierros@planning.lacounty.gov
FAX: (213) 626-0434

RE: Comments on the Draft Environmental Impact Report for the Landmark Village phase of the proposed Newhall Ranch development west of Santa Clarita - Project No. 00-196; Tract Map No. 53108, RCUP-CP00-196/ROAK-OT00-196; RPA-SP00-196/RPA-LP00-196; RCUP-T200500112/RHWY-HR00-196/RPA-PA00-196; State Clearinghouse No. 2004021002.

Dear Mr. Fierros,

The California Native Plant Society (CNPS) is a non-profit organization of more than 10,000 laypersons and professional botanists organized into 32 chapters throughout California. The mission of the California Native Plant Society is to increase understanding and appreciation of California's native plants and to conserve them and their natural habitats, through education, science, advocacy, horticulture and land stewardship. The CNPS has been very involved in Santa Clara River Valley plant issues for years. Based on our experience, we offer the following comments on the Landmark Village Draft Environmental Impact Report (DEIR). Our comments have been divided into three section: 1) General comments focusing on the deficiences of the DEIR, 2) DEIR specific comments and 3) Vegetation issues not adequately addressed in the DEIR. 1

Because the Landmark Village impacts are identified as being significant and unavoidable, due to the loss of sensitive species, loss of rare plant communities, and loss of overall habitat, we request the Department of Regional Planning revisit the proposed development and reduce these impacts to a level of non-significance. 2 The on-going degradation of California's native flora on the proposed Landmark Village, which is part of an internationally recognized biodiversity hotspot (Conservation International 2007), is simply unacceptable. The County needs to allow for appropriate development that will cause less-than-significant impacts to our precious flora in Los Angeles County. 3 While we note that most of the DEIR document relies heavily on the Specific Plan Analyses and Mitigations, we remind the County that the Specific Plan is a non-actionable document, and that this DEIR is supposed to provide the analyses and mitigations to minimize and mitigate the impacts of the proposed Landmark Village project to the maximum extent practicable. 4

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General Comments:

Numerous plans are proposed to be provided to the County and/or California Department of Fish and Game, prior to ground disturbing activities. The failure to include these plans in the DEIR or disclose them to the public as part of the potential environmental impact disclosure and mitigation scenario violates the California Environmental Quality Act (CEQA), because it fails to provide the public with a complete review of the impacts to the environment from these proposed plans and the efficacy of the plans to minimize or mitigate impacts to native plants and plant communities. 5

The distribution and request for review of this DEIR is premature in light of the fact that no required federal or state permits (ie. Army Corps of Engineers 404 permit, State Department of Fish and Game Seciton 1600 permit and State Regional Water Quality Control Board's Section 402 certification) are yet granted or apart of a public process other than the Notice of Intent/Preparation. The County needs to wait until that process has been finalized to determine if this project is even feasible under the constraints of those permits - if those permits are even issued. 6

The Santa Clara River, the last free-flowing river in Los Angeles County and a part of Significant Ecological Area 23 (SEA 23), is proposed to be channelized through the benign and ecologically sensitive-sounding buried bank stabilization. In reality this technique will result in a concrete lined channel once flooding has scoured away the banks that bury the "buried" concrete. 7 Rare riparian vegetation communities (identified in the document as Arrowweed scrub, Mulefat scrub, Southern Willow scrub, River Wash, Fresh Water Marsh, Alluvial Scrub and Scalebroom Scrub) will also have decreased areas in which to grow. 8 Southern California has already lost over 98% of its natural wetlands (Bowler 1989). Riparian areas are really considered natural infrastructure by forward thinking agencies for all of the free benefits that they provide, including reduction of flooding, groundwater recharge opportunities, water treatment, not to mention the habitat for rare species. We urge the County to reconsider the need for curtailing these important "free services" just to build a housing development in the floodplain of a river. 9

We fail to see the justification for channelizing both sides of the Santa Clara River well beyond and downstream from the actual building site. As referenced above the impacts to the Santa Clara River and SEA 23 in these areas of no current building is unjustified and the impacts to the riparian values in these areas will be significantly impacted for no apparent reason. We urge the County to abandon the "buried bank stabilization" in these areas. 10

DEIR Specific Comments:

Pg. 4.4-18. Despite CNPS' scoping request (dated 6/30/2005) that the botanical surveys "should follow CNPS and CDFG floristic survey guidelines and should be documented as recommended by CNPS and California Botanical Society policy guidelines" and that the "Habitat classification should follow both CNPS' *Manual of California Vegetation* and the modified version of Cowardin et al. (1979) developed by Ferren et al. (1996)", the DEIR fails to do either. Absent commonly accepted survey methodologies and vegetation classification schemes, it is difficult for the CNPS to accurately evaluate the impacts and proposed mitigations. When the County solicits comments to facilitate the review of a proposed project, and an interested party, like the CNPS provides detailed comments on appropriate, widely accepted methodologies for evaluating resources 11

during the scoping process, only to have those methodologies disregarded is frustrating at a minimum. Failing to use the methodologies or even failing to provide reasons why they were not used suggests a blatant disregard for public input. 11

Pg 4.4-18 Non-Native Grasslands. The occurrence of native grasses, even at the less than 10% density, suggests that the impacts to this extensive community, may be significant. Native grasslands are a rare and declining plant community in the State (CNDDB 2007) and efforts to protect and enhance this plant community are essential to preventing the extinction of a classic California vegetation community. 12

Pg 4.4-56 Plant Community/Land Use Impact Summary Table 4.4-8. The CNPS fails to see how eliminating 96% of all of the vegetation communities on site complies with CEQA's requirement to minimize and mitigate impacts. **Five** rare plant communities will be completely extirpated from the site, including Coastal Sage Scrub-Chaparral Scrub, Elderberry Scrub, Alluvial Scrub, Great Basin Scrub, and Scalebroom Scrub. Additionally, **seven** additional rare plant communities will be significantly eliminated including 83% of the Southern Cottonwood Willow Riparian Forest, 98% of the Coast Live Oak Woodland, 99% of the Coastal Sage Scrub, 91% of the Arroweed Scrub, 81% of the Mulefat Scrub, 85% of the Southern Willow Scrub,and 84% of the Freshwater Marsh. Where is the mitigation for these severe impacts? Little in the Specific Plan or Landmark Village mitigations decrease these impacts. Furthermore, the "mitigation" is typically revegetation of these areas. While our chapter supports revegetation efforts on previously disturbed lands, the best available science finds that revegetation efforts are not successful in "replacing" the plant communities. (Ambrose and Lee 2004., Longcore et al. 1997). Lastly, no "revegetation plan" is available for us to evaluate the effectiveness of the "mitigation". This is one example of the many plans missing from the DEIR. 13 14

Page 4.4-57 (a) Common Plant Communities. A number of the plant communities identified under this section are actually rare plant communities, including Coastal Sage Scrub, Elderberry Scrub, and Alluvial Scrub. 15

Page 4.4-65 Mitigation Measure 4.4-20. While not described in this section merely referenced, the mitigation measure as described in ES-88 and 4.4-134 while well intentioned, is likely to fail if transplantation or seed collection is necessary, based on the failure rate of such "mitigation" strategies for other rare plants (Fiedler 1991, Allen 1994, Howald, 1996) 16

Page 4.4-66. The mitigation plan for the slender mariposa lily needs to be included in the DEIR as part of the public review process. No evaluation of the potential success/failure of the transplantation of these 887 above ground plants plus their underground plants and seed bank can be evaluated. Furthermore, no criteria for the evaluation of "suitability" at the off-site "mitigation areas" is provided. In order for a species to be sustained throughout its range, the CNPS requests that studies include "onsite" mitigation, not moving all of the mitigation to the High Country SMA. 17

Page 4.4-66. Despite both the Peirson's morning glory and the Southern California black walnut being CNPS List 4 – Watch list species, it does not eliminate their consideration under CEQA on the project site. Simply stating that eliminating them on the project site would not reduce regional population numbers to levels below self-sustaining numbers simply allows the species further declines until "death by one- 18

18

thousand cuts" requires state or federal protection. The County needs to be proactive in retaining the species in their natural habitat on the project site to preclude future species crisis management. Furthermore, Peirson's morning glory is only known from Los Angeles County. Southern California black walnut is more widely distributed, but is on the edge of its distribution in the Santa Clara River Valley. Both of these issues need to be addressed as apart of the CEQA process. 19 20

Page 4.4-67 San Fernando Valley Spineflower. Despite the documentation that the nearest location of the San Fernando Valley Spineflower is 100 feet away from the project site, the CNPS contends that the DEIR is premature. The joint effort by the Federal Army Corps of Engineers and the State Department of Fish and Game to develop a comprehensive plan for the San Fernando Valley Spineflower is not yet formulated or available for public review. To dismiss impacts to the San Fernando Valley Spineflower from this project's impacts in the absence of the comprehensive plan is "jumping the gun". The County needs to wait until the San Fernando Valley Spineflower plan process has been completed, and incorporate those findings into the DEIR for the Landmark Village. 21

Page 4.4-70. In order to maintain oak woodlands and resources throughout the species ranges, the CNPS contends that mitigation of the 4.45 acres of oaks on the Landmark Village site by planting oaks in the High Country SMA violates the intent of both of these laws. Mitigation must be done on site. Also, the Oak Resource Replacement Plan is another missing document that is not available for public review as part of this DEIR. Absent this plan, it is impossible to evaluate the adequacy or appropriateness of the oak mitigation. Therefore the mitigations as proposed do not comply with CEQA. 22 23

Page 4.4-83. No riparian revegetation plan is included for the four sensitive riparian plant communities in this section (note comments on other rare plant communities that are inappropriately included in the "common" plant communities) another essential document for the CEQA review that is missing. Absent this plan, it is impossible to evaluate the adequacy or appropriateness of the riparian mitigation. Therefore the mitigations as proposed do not comply with CEQA. 24

Page 4.4-84 No Great Basin scrub revegetation plan is included. It is the sixth missing plan that is key to mitigation, yet unavailable for public review. As stated repeatedly before, it is impossible to evaluate the adequacy or appropriateness of the plans as mitigation. Therefore the mitigations as proposed do not comply with CEQA. 25

Mitigation Measures in general:
Many of the Specific Plan mitigation measures are included in the DEIR but only confuse and obfuscate the planning situation. For example, is there a mitigation bank in the River Corridor SMA for riparian habitats (SP4.6-47a)? It was not referenced in the text of the document. Why is it included in the mitigation measures? 26
SP4.6-53. Are additional surveys required? 27
SP4.6-59. Did this happen? There is no documentation in the methodologies in the DEIR or in the Appendices that confirm this mitigation measure. 28

Appendix 4.4
Appendix 4.4 v1 indicates that the short-joint beaver tail cactus (*Opuntia basilaris* var. *brachyclada*) occurs in the area where the Ptoale & Reclaimed Water Tank Site (Fig. 4.4-1) is proposed. No discussion of this species or constraints on this site is mentioned 29

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and no mitigations are proposed in the DEIR text of Section 4.4. The County needs to fully disclose the environmental impacts under CEQA. 29

It is also unclear if all of the project site actually had plant surveys done on it. The Dudek (2002, 2004 and 2005) and the Fix (2002 and 2004) only covered parts of the whole Newhall Ranch Specific Plan. It is undeterminable from these reports if all of the project site for Landmark Village was actually surveyed, despite Page 4.4-18's assertion that "A list of all plant species observed on the project site is included in Appendix 4 4). We could find no master list of plant species for the proposed Landmark Village site. 30

Issues not Adequately Addressed in the DEIR

At least eight (or maybe nine) plans are referred to in the DEIR, but not provided for public review. Each of these plans has potential to have a significnat impact on vegetation resources in the projects area, and yet public review is absent. Their absence does not comply with CEQA. The missing documents include: 31

1) Wildfire Fuel Modification Plan
2) Slender Mariposa Lily Restoration Plan
3) Oak Resource Replacement Plan
4) San Fernando Valley Spineflower Plan
5) 1600/404 permits Revegetation Plans for numerous riparian plant communities
6) Great Basin Sagebrush Revegetation Plan
7) Landscape Plan
8) Irrigation Plan
9) Habitat Enhancement Plan (if that is different from the Revegetation Plan)

There is no discussion of the impact to native habitats from the introduction of non-native and Invasive plant species. While the mitigation measure SP 4 6-11 identifies two non native plants, it also doesn't explicitly state removal of them as a mitigation. Absent the landscape, it is unclear in this DEIR what plants will be allowed for planting and which will be prohibited. Additionally, no mechanisms appear to be in place to assure that invasive exotics are not planted, and if they are found, no mechanism to remove them. Because invasive exotic plants are one of the greatest threats to our world-class flora (Schwartz et al. 2005, Bossard et al. 2000), the CNPS supports educational programs explaining the significant detriments of invasive exotic plants on our native flora. However, simply distributing a list of plants "to future occupants of the Landmark Village site" is not adequate mitigation. 32 33 34

Absent the irrigation plan, impacts from "urban drool" (landscape irrigation, stormwater runoff, etc.) to the natural open space areas and river channel are not identified or analyzed in the context of the Biota section 4.4. 35

Fuel modification is a significant threat to native habitats. In CNPS' scoping comments, we requested that fuel modification be included as part of the footprint of development. Absent the fuel modification plan for the Landmark Village, it is unclear if the riparain buffer area will be obliterated by required native vegetation clearance (ie. "fuel modification"). This would clearly defeat the purpose of a buffer. The failure to identify the impacts to native habitats, rare plants and plant communities from the required "fuel modification" fails to fully disclose potential impacts via the CEQA process. 36 37 38

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Conclusion

The CNPS opposes the Landmark Village project as proposed for 1) the significant impacts that it will have to rare plants and plant communities, without efforts to avoid, minimize and mitigate the projects impacts, 39 and 2) the failure of the DEIR document to fully disclose the impacts to native plants and plant communities as required under CEQA. 40 We urge the County to address our issues in a supplemental DEIR which modifies the project to reduce the on-site impacts to less-than-significant levels. 41

Thank you for the opportunity to submit these comments. We look forward to working with the County Regional Planning and the Newhall Ranch Company to make a workable project for humans and the environment on which we depend 42

Sincerely

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cc: Honorable Mike Antonovich, Supervisor, Los Angeles County
Betty Courtney, CDFG
USFWS

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D20. Letter from California Native Plant Society, dated February 19, 2007

Introduction

Comments have raised concerns over completion of various plans referenced in the Landmark Village Draft EIR. In response, the following plans have been completed, and copies of such plans are included in **Appendix A** of this Final EIR for public review and consideration:

- Preliminary Fire Management Plan (Dudek, June 2007), also generally referred to as the wildfire fuel modification plan;
- Mariposa Lily Plan (Dudek, June 2007);
- Draft Spineflower Conservation Plan (Dudek, June 2007);
- Draft Candidate Conservation Agreement;
- Conceptual Wetlands Mitigation Plan (Dudek, 2007), also generally referred to as the riparian revegetation plan; and
- Mitigation Feasibility Study (Dudek, 2007).

In addition, Dudek completed the Santa Clara River Watershed Study (June 2007), which is included in **Appendix A** of this Final EIR. Additional biota survey reports and studies also are included in **Appendix A** of this Final EIR (e.g., 2007 arroyo toad surveys, coastal California gnatcatcher surveys, raptors and special-status bird surveys).

Neither the Landmark Village Draft nor Final EIR includes an irrigation plan at this time. The irrigation plan is part of the mitigation required by the previously approved Newhall Ranch Specific Plan. A description of the irrigation plan is provided in Mitigation Measure SP 4.6-75, at p. 145 of this Final EIR, revised **Section 4.4, Biota**. This plan is required to be submitted for approval by the County prior to the initiation of grading operations. The plan is to satisfy certain performance criteria, including describing watering control procedures necessary to prevent discharge of construction water into the Newhall Ranch spineflower preserves and on the ground sloping toward the preserve(s). Additionally Mitigation Measure SP 4.6-48 requires the preparation of an oak tree relocation and replacement plan. This plan will be subject to approval by the County of Los Angeles.

In addition, according to the Final EIR, revised **Section 4.4, Biota**, at p. 73, the Landmark Village project includes project design features, or PDFs, to address urban runoff from irrigation and stormwater. The PDFs (Project Design Features) include site design, source control, treatment control, and hydromodification control Best Management Practices (BMPs). Stormwater runoff from all urban areas

within the Landmark Village project will be routed to bioretention areas, vegetated swales, and/or extended detention basin treatment controls BMPs. The effectiveness of these PDFs to maintain water quality in the Santa Clara River was analyzed by GeoSyntec Consultants. (Please see Landmark Village Draft EIR, Appendix 4.3, for GeoSyntec's 2006 Landmark Village Water Quality Technical Report.)

Further, neither the Landmark Village Draft nor Final EIR includes a landscaping plan at this time. The landscaping plan is part of the mitigation required by the Landmark Village Draft EIR. A description of the landscaping plan is provided in Mitigation Measure LV 4.4-28, at p. 160 of this Final EIR, revised **Section 4.4, Biota**. This plan is required to be submitted for approval by both the County and CDFG (California Department of Fish and Game) prior to the issuance of a grading permit. The plan is to satisfy certain performance criteria, including a plant palette composed of native or non-native non-invasive species that are adapted to the conditions found on the Landmark Village site, without requiring high irrigation rates. Irrigation of perimeter landscaping also must be limited to temporary (i.e., until plants become established) drip irrigation. The landscaping plan will also include a list of invasive plant species prohibited from being planted on the project site. This list of prohibited plants will be compiled in cooperation with a qualified restoration specialist and will be distributed to future occupants of the Landmark Village site.

This mitigation (LV 4.4-28) is recommended to reduce the magnitude of potential significant impacts resulting from an increase in non-native plant species due to development. Such impacts are addressed in the Final EIR, revised **Section 4.4, Biota**, at p. 107.

Response 1

This comment is an introduction to comments that follow. No further response is required.

Response 2

The comment expresses an opinion. The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not address or question the content of the Draft EIR, no further response is required.

Response 3

Please see **Response 2**, above.

Response 4

The Newhall Ranch Specific Plan has been designed to develop areas that generally have been disturbed while preserving over 9 square miles of land containing the most significant natural environmental resources, including:

(a) The High Country, which is a major portion of the County's SEA 20; SEA 20 consists of nearly 4,200 acres;

(b) The Santa Clara River property, which is a portion of County SEA 23, and consists of nearly 1,000 acres. Development has been planned to minimize the necessity of removing sensitive habitat for flood control purposes and provides valuable habitat for various sensitive wildlife and plant species; and

(c) Open Areas, consisting of approximately 1,100 acres, will preserve oak woodlands, ridgelines, and sensitive species.

The above breakdown does not include the preservation of approximately 1,500 acres of the Salt Creek area in adjacent Ventura County, again preserving habitat for various sensitive wildlife and plant species. In total, the Newhall Ranch Specific Plan will result in the creation of nearly 7,800 acres of public open space.

Furthermore, the Landmark Village Draft EIR, Section 4.4, includes a project-level analysis of the significance of impacts to biological resources. This analysis is consistent with the requirements of CEQA for a project-level EIR, and includes detailed discussions of the biological resources on the Landmark Village project site and of the potential project-related impacts to these resources. See also, revised **Section 4.4, Biota**, in this Final EIR. In addition, each impact discussion notes whether the findings of the project-level analysis are consistent with the findings of the previously certified Newhall Ranch Specific Plan Program EIR. The statement of consistency is provided for informational purposes and is not relied upon in place of the analysis of impacts to biological resources associated with the proposed Landmark Village project.

As discussed in the Landmark Village Draft EIR (p. 4.4-92), the project would be subject to the mitigation measures/conditions of approval contained in the Resource Management Plan of the approved Specific Plan and the Newhall Ranch Specific Plan Program EIR. However, additional mitigation measures are provided to further reduce the magnitude of project-related impacts to biological resources. Specifically, 35 additional mitigation measures are recommended and incorporated into the biological resources section of the Landmark Village EIR. The EIR section has been revised to better identify these measures (see, Landmark Village Final EIR, **Section 4.4, Biota, subsection 10.3, Additional Mitigation Measures Incorporated**).

Response 5

Several of the plans alluded to in the comment are included in the Landmark Village Final EIR. See, **Introduction**, above. These include the slender mariposa lily restoration plan, a wetlands mitigation plan, and a wildfire fuel modification plan. These plans describe how mitigation measures discussed in the Draft EIR will be implemented and how success of the mitigation will be managed and monitored. However, CEQA does not require detailed mitigation plans to be included in an EIR, as long as there is a discussion of what the proposed plan will include and accomplish, including performance standards, and there is a commitment by the lead agency to implement the mitigation. Appropriate summaries, performance standards, and lead agency commitments are provided in the Draft EIR for each of the plans mentioned in this comment. See also **Responses 23 through 25**.

Response 6

See, **Introduction**, above.

The comment is incorrect in stating that release of the Draft EIR is "premature in light of the fact that no required federal or state permits … are yet granted or a part of a public review process." The federal and state agencies generally require that CEQA processing and approval, when required for a project, be conducted prior to issuance of federal and state permits or agreements. For further responsive information, please see **Topical Response 2**: EIS/EIR Project.

Response 7

The comment claims that the Santa Clara River will be "channelized" through buried bank stabilization, and that flooding will scour away the banks, revealing a concrete-lined channel. The Landmark Village Draft EIR extensively addressed buried bank stabilization and its effects. (For example, please see Draft EIR, Section 4.5, Floodplain Modifications, pp. 4.5-41–4.5-43, 4.5-48–4.5-71; and revised **Section 4.4, Biota**, pp. 4.4-72–4.4-75.) In addition, the County has previously responded to unsubstantiated claims that the bank stabilization would "fail," exposing a concrete-lined channel. Please refer to **Responses 2**, **4**, and **10** to letter **D12** from Friends of the Santa Clara River, dated January 21, 2007.

Response 8

The Landmark Village Draft EIR (pp. 4.4-57–59, 4.4-83) includes an analysis of impacts to riparian plant communities and requires mitigation to address associated significant impacts (Mitigation Measures LV 4.4-7 [Mitigation Measure LV 4.4-1 in the Final EIR] and Mitigation Measures SP 4.6-1 through SP 4.6-27, and SP 4.6-63). The proposed project design provides the opportunity to create riparian habitat on site, adjacent to existing riparian habitats. Specifically, the majority of the proposed buried bank stabilization

would be installed outside of the existing riparian zone, within disturbed upland habitats devoid of riparian or other native habitats. This bank stabilization technique provides the opportunity to create additional riparian habitat between the existing riparian corridor and the location of the proposed bank stabilization. Given the above, opportunities to implement the required replacement of riparian habitats are available.

Response 9

The comment is noted. The River Corridor SMA/SEA 23 would protect approximately 1,000 acres of wildlife habitat along the Santa Clara River in perpetuity.

Response 10

As indicated previously, Landmark Village is part of the Newhall Ranch Specific Plan. The approved Specific Plan and Conditional Use Permit No. 94-087-(5) permitted the use of buried bank stabilization in the area cited by the comment as well as three bridge crossings over the Santa Clara River, including the Long Canyon Road Bridge. The impacts associated with this bridge crossing and the bank stabilization have been analyzed at the programmatic level in the certified Newhall Ranch Specific Plan Program EIR and are analyzed at the project-level in the Landmark Village EIR. One of the benefits of having an approved Specific Plan is that it permits the implementation of various components of that approved plan.

Response 11

The vegetation map has been updated along with the biota section with current classifications/acreages, corresponding with the *Vegetation Classification and Mapping Program, List of California Terrestrial Natural Communities Recognized by the California Natural Diversity Database* (CDFG 2003). Please see revised **Section 4.4, Biota**, in this Final EIR.

Response 12

The comment is noted. As stated in **Response 3** to letter **E143** from David Magney, Environmental Consulting, dated January 30, 2007, the vegetation mapping was updated in the summer of 2006 and all references to "non-native grassland" will be changed to "California annual grassland," pursuant to *The Vegetation Classification and Mapping Program: List of California Terrestrial Communities Recognized by The California Natural Diversity Database* (CDFG 2003). Please see revised **Section 4.4, Biota**, in this Final EIR, p. 4.4-74, which has been revised to state:

> "Given the altered condition of these areas, and that this habitat type is not considered a sensitive natural community by resource agencies, the loss of non-native grassland would be a less than significant impact. California annual grasslands may support special-status plant and animal species and provide foraging habitat for raptors (birds of prey). Therefore, the Newhall Ranch Specific Plan Program EIR included the loss of this plant community as part of the analysis of the overall loss of wildlife habitat (Wildlife Habitat Loss, below)."

As noted in the description above, California annual grasslands are not considered a sensitive natural community by any resource agencies. Although the impact to this vegetation community was not considered significant, it was included as wildlife habitat in the Wildlife Habitat Loss discussion (see Final EIR, revised **Section 4.4, Biota, subsection 9(b)(1)(b)**). This section states that the loss of 918.84 acres of wildlife habitat "represents a substantial loss of habitat for wildlife species and is considered a significant impact."

By including the loss of California annual grasslands in the loss of wildlife habitat, and considering this loss a significant impact, the loss of California annual grasslands has been assessed. Mitigation for wildlife habitat loss is accomplished by using the approved mitigation measures from the Newhall Ranch Specific Plan Program EIR. These Mitigation Measures include SP 4.6-21 to SP 4.6-27 and SP 4.6-37 to SP 4.6-42. These measures will preserve significant portions of the River Corridor SMA/SEA 23, the High Country SMA/SEA 20, and the Salt Creek areas. These areas collectively include 662.24 acres of California annual grassland.

Response 13

The Landmark Village project is a component of the greater Newhall Ranch Specific Plan. The Specific Plan guides the long-term development of the 11,963-acre Newhall Ranch community and includes development within five villages (including Landmark Village) as well as the preservation of large areas of open space. The Specific Plan includes the protection in perpetuity of approximately 6,700 acres of wildlife habitat and an additional 1,100 acres of other open areas. A summary of the plant communities to be protected has been included in the Final EIR, revised **Section 4.4, Biota** (see new table entitled, **Table 4.4-10, Total Conservation Area and Preserved Plant Communities**). The preservation of these plant communities, as well as the other mitigation measures included in the Landmark Village Draft EIR, serve to reduce the magnitude of impacts related to the loss of plant communities and associated wildlife habitat.

Response 14

See **Response 5**, above.

Response 15

As discussed in the Landmark Village Draft EIR (pp. 4.4-36–4.4-37), the CDFG Wildlife and Habitat Data Analysis Branch has developed a *List of California Terrestrial Natural Communities*. The most recent version of this list, dated September 2003, is derived from the CNDDB and is intended to supersede all other lists developed from the CNDDB. It is based on the detailed classification put forth in *A Manual of California Vegetation* (Sawyer and Keeler-Wolf 1995). It is also structured to be compatible with previous CNDDB lists (e.g., Holland 1986). For the purposes of the Draft EIR, plant communities denoted on the list as "high priority for inventory in CNDDB" in the September 2003 version, or that are otherwise regulated by local, state, and/or federal resource agencies, are considered "special status."

The 2003 CDFG list represents that most recent evaluation by the CDFG of the rarity of a plant community, and as recommended by CDFG, should supersede earlier lists of plant communities (and associated evaluations of the rarity of plant communities) adopted by the CDFG. Accordingly, California sagebrush scrub is not identified in the EIR as a sensitive plant community because it is not identified on the 2003 list as "high priority for inventory" or otherwise regulated by the County. Regardless, the Draft EIR concludes that impacts to California sagebrush scrub are significant because of the habitat value this plant community provides for common and special-status plant and wildlife species.

Similarly, alluvial scrub is not identified as a sensitive plant community because it is not denoted on the 2003 list as "high priority for inventory" or otherwise regulated by the County. Given the small acreage of this plant community that would be developed (0.08 acre), the Draft EIR concludes that associated impacts would be less-than-significant. However, where alluvial scrub occurs within a drainage (under the jurisdiction of the ACOE and/or the CDFG), the replacement of the plant community would be required as described in Mitigation Measure LV 4.4-7 (LV 4.4-1 in the Revised EIR).

The Draft EIR (p. 4.4-58) concludes that impacts to elderberry scrub are significant given that the plant community is relatively uncommon in the project area and requires mitigation to address the impact (Mitigation Measure LV 4.4-16 [LV 4.4-2 in the Final EIR]). The Draft EIR has been revised to reflect that elderberry scrub is considered a sensitive plant community based on the 2003 CDFG list.

Response 16

Please see **Response 19** to letter from Center for Biological Diversity, dated February 20, 2007.

Response 17

Please see **Response 21** to letter from Center for Biological Diversity, dated February 20, 2007.

Response 18

Page 4.4-29 of the Landmark Village Draft EIR, *Special-Status Plants*, includes CNPS List 4 plant species in the definition of "special-status plants." The presence and status of these species are discussed on p. 4.4-30 of the Draft EIR. Page 4.4-66 of the Draft EIR includes a discussion of potential impacts on both the Peirson's morning glory and the southern California walnut and lists a number of reasons why impacts on these species on the Landmark Village site would not constitute a significant impact under CEQA. The Draft EIR also states (on the same page) that these findings are consistent with those of the Newhall Ranch Specific Plan Program EIR from which the Landmark Village Draft EIR is tiering. These discussions serve as adequate "consideration under CEQA" for these two species.

Response 19

The comment is noted.

Response 20

As discussed on p. 4.4-55 of the Draft EIR, direct impacts on individuals or populations of plant and animal species "takes into consideration the number of individual plants or animals potentially affected, how common or uncommon the species is both on the project site and from a regional perspective, and the species' sensitivity status according to resource agencies." The discussion of impacts on the Pierson's morning glory and the southern California walnut on p. 4.4-66 of the Draft EIR considered all these elements, including regional distribution, as they pertain to these two species. Please see **Response 18**, above.

Response 21

A draft Spineflower Conservation Plan (SCP) is under review by USFWS and CDFG, and has been included in **Appendix A** of the Landmark Village Final EIR. The SCP is a conservation and management framework to permanently protect and manage a system of preserves designed to maximize the long-term persistence of the San Fernando Valley spineflower. USFWS and CDFG are reviewing the SCP in the context of a draft EIS/EIR and Candidate Conservation Agreement (CCA). Please see **Topical Response 2**: EIS/EIR Project, for further responsive information regarding the EIS/EIR project and the draft Spineflower Conservation Plan (see Final EIR, **Appendix A**).

The boundaries of the Landmark Village borrow site in Adobe Canyon will be revised to be a minimum of 300 feet from a spineflower occurrence.

Response 22

As previously discussed, the Landmark Village project is a component of the greater Newhall Ranch Specific Plan. The Specific Plan guides the long-term development of the 11,963-acre Newhall Ranch community and includes the preservation of large areas of open space. In the preliminary planning phases, large contiguous areas of wildlife habitat (including oak woodlands) were designated for protection and to facilitate mitigation at the project level. The River Corridor SMA/SEA 23 and the High Country SMA/SEA 20 would protect approximately 585 acres of oak woodland and 300 acres of oak savannah in perpetuity. The preservation of the Salt Creek area would protect approximately 266 acres of oak woodland and 113 acres of oak savannah in perpetuity. In total, conservation easements would be placed over 851 acres of oak woodland and 413 acres of oak savannah (including the River Corridor SMA/SEA 23, the High Country SMA/SEA 20, and the Salt Creek area). The preservation of this oak woodland habitat, as well as the implementation of Mitigation Measure LV-21 (Mitigation Measure LV 4.4-6 in the Final EIR) would comply with the County Oak Tree Ordinance, the requirements of Public Resources Code section 21083.4, and would mitigate impacts to a less than significant level.

Response 23

Please see **Response 5**, above, regarding the need to include detailed mitigation plans under CEQA. With respect to the Oak Resource Replacement Plan, Mitigation Measure SP 4.6-48 (from the approved Newhall Ranch Specific Plan Program EIR), which is found on p. 4.4-107 of the Landmark Village Draft EIR, Section 4.4, Biota, includes a discussion of the contents of the replacement plan, who will need to review it, and when the plan must be in place (prior to recordation of construction-level final subdivision maps).

Response 24

Please see **Response 5**, above, regarding the need to include detailed mitigation plans under CEQA. Mitigation Measure LV 4.4-7 on p. 4.4-129 of the Draft EIR adequately summarizes the contents of the revegetation plan, states that the plan shall demonstrate the feasibility of creating the required mitigation acreage, and states that the plan shall be subject to the approval of CDFG, the Corps, and the County and that such approval must occur prior to the issuance of grading permits.

Response 25

Please see **Response 5**, above, regarding the need to include detailed mitigation plans under CEQA. Mitigation Measure LV 4.4-23 on p. 4.4-135 of the Draft EIR adequately summarizes the contents of the plan and states that the plan must be approved by the County prior to the issuance of grading permits.

Response 26

The Landmark Village project would be subject to the mitigation measures/conditions of approval contained in the Newhall Ranch Specific Plan and the Newhall Ranch Specific Plan Program EIR. These previously approved mitigation measures were included in the Landmark Village Draft EIR, because some of the measures are applicable to the Landmark Village project site. At this time, there are no established mitigation banks in the River Corridor SMA/SEA 23 for riparian habitats as part of the Landmark Village project. However, the previously approved Newhall Ranch Specific Plan (May 2003) permits mitigation banking within the River Corridor SMA/SEA 23, the High Country SMA/SEA 20, and the Open Area land use designations, and the previously certified Newhall Ranch environmental documentation includes Mitigation Measures SP 4.6-47a, which describes the requirements associated with mitigation banking in those approved land use designation areas.

Response 27

As discussed in the Landmark Village Draft EIR (p. 4.4-14, Table 4.4-3), numerous site-specific biological surveys have been conducted on the Landmark Village project site. See also, revised **Section 4.4, Biota**, of this Final EIR. These surveys are consistent with the requirements of Mitigation Measure SP 4.6-53.

Response 28

As discussed in the Landmark Village Draft EIR (p. 4.4-13), all surveys were conducted in accordance with published resource agency survey protocols, where they exist, or consistent with accepted survey methodologies for the particular species when published protocols did not exist. Additionally, all survey results have been submitted to the appropriate resource agency and consultation is occurring in cases where the proposed project could adversely affect resources under the agencies' jurisdiction. See also, revised **Section 4.4, Biota**, of this Final EIR.

Response 29

The sensitive plant survey report for 2002 initially identified short joint beaver tail cactus as potentially occurring on site. Later survey reports indicated the cactus initially thought to be short joint beaver tail cactus was not actually that but another species. See Table 3 in each of Dudek's 2003, 2004, 2005, and 2006 Sensitive Plant Survey Reports included in Appendix 4.4 of the Draft EIR: "This plant was identified as on site by Dudek in 2002; however, recent investigations indicate that the *Opuntia basilaris* plants on Newhall Ranch are not *O. basilaris* var. *brachyclada*, but are *O. basilaris* var. *ramosa*." Therefore, this species was eliminated from further analysis.

Response 30

Dudek conducted surveys for special-status plants each spring and summer from 2002 through 2006 (attached in the Draft EIR, Appendix 4.4). Figure 2 in each of the reports indicates the areas surveyed and areas not surveyed within the Newhall Ranch Specific Plan. Primarily, the active river channel and active agricultural fields were excluded from surveys. FLx conducted surveys within the active river channel in 2002 and 2004 (see, Draft EIR, Appendix 4.4, FLx Sensitive Plant Species Surveys 2002 and FLx Sensitive Plant Species Surveys 2004). The only areas within the Landmark Village site not surveyed for special-status plants were those agricultural fields, which are regularly disked, irrigated, and treated with herbicides. Botanical species lists were not created for each Village within the Specific Plan, but rather for the Specific Plan as a whole. Appendix 4.4 includes a list of all plant species observed on the Specific Plan project site.

Response 31

Please see **Response 5**, above, regarding the need to include detailed mitigation plans under CEQA. In addition, please see **Introduction**, above, for a listing of the plans that have been provided and included in **Appendix A** of this Final EIR. **Responses 23** through **25**, above, also provide responsive information regarding several of these plans.

Response 32

The Landmark Village Draft EIR (pp. 4.4-89–4.4-90) includes an analysis of impacts associated with increased populations of non-native plant species. Given the potential of non-native, invasive plants to be introduced by the proposed project, and the potential for these plants to spread into natural areas (and the subsequent reduction in habitat values), the Draft EIR concludes that the impact on native biological resources as a result of increased non-native plants species is potentially significant.

As required by the Draft EIR (Mitigation Measure LV 4.4-11 [LV 4.4-28 in the Final EIR]), prior to the issuance of a grading permit, the applicant is required to prepare a landscaping plan. This plan will be subject to review and approval by the County and CDFG, and will include a plant palette composed of native and non-native, non-invasive species that are adapted to the conditions found on the Landmark Village project site. The landscaping plan will also include a list of invasive plant species prohibited from being planted on the project site. This list of prohibited plants will be compiled in cooperation with a qualified restoration specialist and distributed to future occupants of the Landmark Village tract map site. Please see also **Introduction**, above, for responsive information concerning the landscaping plan.

Response 33

Please see **Response 32**, above.

Response 34

Please see **Response 32**, above. In addition to the distribution of a list of prohibited plants to the future occupants of the Landmark Village tract map site, the preparation of a landscaping plan, including a plant palette composed of native, non-invasive species that are adapted to the conditions found on the Landmark Village site, is required.

The CNPS, and other organizations, are encouraged to make available additional educational programs or materials to future occupants of the Landmark Village tract map site.

Response 35

The comment addresses the absence of an irrigation plan at this time. For information responsive to this comment, please see **Introduction**, above, concerning the project's irrigation plan and the timing and associated requirements for such plan.

Dry weather flow impacts are analyzed in Section 4.3, Water Quality, and Appendix 4.3 of the Landmark Village Draft EIR. "Urban drool" factors, including impacts associated with landscape irrigation and other urban uses, were considered for purposes of the impacts analysis. In order to quantitatively address dry weather impacts, a dry weather water balance was performed, which considered these factors. The water balance predicted that all dry weather flows will be infiltrated or removed by evapotranspiration in the vegetated treatment control PDFs, which also provide hydrologic source control. In summary, the model predicts that there will be no "urban drool" to the Santa Clara River as a result of the project.

Response 36

The comment is noted. The acreage of the fuel modification zone was included in the calculations of impacts to on-site biological resources as part of the development footprint. Even so, most of the fuel modification zone for the Landmark Village project occurs within agricultural areas and will not result in additional impacts to native vegetation. Please see **Introduction**, above.

Response 37

The fuel modification zone for structures adjacent to the Santa Clara River will extend approximately 100 feet from the structure into the setback area. Consequently, the fuel modification zone will not encroach upon the riparian corridor or the adjacent upland habitat buffer.

Response 38

Please see **Responses 36** and **37**, above.

Response 39

The comment is noted. The Specific Plan design, including the Landmark Village project, included extensive efforts to minimize impacts to sensitive biological resources, and to protect large areas of high biological value habitat. As discussed in the Final EIR, **Section 4.4, Biota**, approximately 6,700 acres of habitat would be protected in perpetuity, and an additional 1,100 acres would be place in other open areas. These protected/preserved areas support populations of numerous special-status plant and wildlife species.

Response 40

The comment is noted. Also, please see **Response 4**, above. No further response is required given that the comment does not address or question the content of the Draft EIR.

Response 41

The comment is noted. No further response is required given that the comment does not address or question the content of the Draft EIR.

Response 42

The comment is noted. No further response is required given that the comment does not address or question the content of the Draft EIR.

Letter No. D21

ENV-21

February 20, 2007

Mr. Daniel Fierros
Los Angeles County
Department of Regional Planning
320 West Temple Street
Los Angeles, CA 90012

BY MAIL AND EMAIL
dfierros@planning.lacounty.gov

Re: Draft EIR for Landmark Village Project, Los Angeles County Project No. 00-196

Dear Mr. Fierros:

Please accept the following comments on the Draft Environmental Impact Report ("DEIR") for the Landmark Village Project (the "Project") on behalf of the Center for Biological Diversity ("Center"). The Center is a non-profit environmental organization dedicated to the protection of native species and their habitats in the Western Hemisphere through science, policy, and environmental law. The Center has over 32,000 members worldwide, including members in northern Los Angeles and Ventura Counties in the vicinity of the Project. 1

The County's Review of the Project Should be Stayed Pending Completion of the U.S. Army Corps of Engineers and the California Department of Fish and Game's Permitting Processes

The U.S. Army Corps of Engineers and the California Department of Fish and Game are currently preparing an Environmental Impact Statement/Environmental Impact Report ("EIS/EIR", described as the "Newhall Ranch Resource and Development Plan EIS/EIR" in the Landmark Village DEIR) for the actions these agencies must approve for the Newhall Ranch project, including a long-term section 404 permit, streambed alteration agreement, and endangered species permits. Although no public draft of the EIS/EIR is available, the County's review of the Landmark Village project is moving towards completion.

This sequence is backwards. The EIS/EIR will determine the parameters of projects contained in the Newhall Ranch Specific Plan that are subject to Army Corps and/or CDFG permits. The EIS/EIR will determine the range of alternatives for these projects, and will conceivably consider alternatives not evaluated in the DEIR for the Landmark Village project. The DEIR's comparison of alternatives without the benefit of the EIS/EIR is skewed because it treats the preferred alternative as feasible even though it may not be in light of the analysis in the forthcoming EIS/EIR. Without a section 404 permit the project would most likely have to be substantially altered. Moreover, special conditions placed on the permit could significantly alter the project. The analysis in the EIS/EIR, and the decisions of the Army Corps and CDFG, will determine fundamental aspects of the environmental review of the Landmark Village project. 2

including the project description, analysis of environmental impacts, analysis of cumulative impacts, and range of alternatives, yet the Landmark Village review is proceeding before the completion of the EIS/EIR. This sequencing is likely to result in the need to revise and recirculate the Landmark Village EIR, creating a greater delay than if the review of the project were stayed pending completion of the EIS/EIR, adoption of a record of decision for the Army Corps' 404 permit, and adoption of Army Corps/CDFG-approved mitigation measures. 2

Project Description

The DEIR states (p. 1.0-48) that the applicant is proposing to construct the Long Canyon Bridge as part of the current project. The Long Canyon Bridge, however, does not provide access to the project, but connects the project to future, unapproved phases of Newhall Ranch. This bridge should be deleted from the project description and approvals. 3

The project description includes as a component of the project buried bank protection downstream from the project (see, e.g., Fig. 1.0-23). The DEIR subsequently states (p. 1.0-53) that the downstream bank stabilization is "necessary to mitigate impacts associated with the Landmark project." The downstream bank stabilization must therefore not be included in the Project Description as a component of the project, but evaluated as a potential mitigation measure. 4

Because the downstream bank stabilization also functions as flood protection for future, unapproved development, the DEIR must fully disclose the impacts associated with the project and the Long Canyon Bridge, include mitigation measures that are narrowly-tailored to mitigate the impact (and not to provide flood control benefits for future development), and consider less damaging alternatives. 5

The project description does not describe the fuel modification zones that will be required for the Project. As a result, it is impossible to determine the full range of Project impacts. It is likely that fuel modification zones will impinge on habitat outside the Project's footprint. The full range of potential fuel modification effects should be included in the project description. The DEIR states (p. 4.14-18) that a Wildfire Fuel Modification Plan depicting the fuel modification zones will be prepared later. CEQA, however, requires disclosure of the environmental effects of the fuel modification zones now, even if the plan is to be prepared later. 6

Environmental Setting

Although the DEIR acknowledges that the Project will result in significant indirect impacts to offsite biological resources (p. 4.4-91), the description of the existing environment omits any meaningful description of the areas most likely to be harmed by these indirect impacts, including the prime riparian forest habitat immediately adjacent to the Project. It is not sufficient that these areas were generally described in the Newhall Ranch Specific Plan EIR and Additional Analysis. A more detailed description of offsite areas that will be affected by the Project must be included in the DEIR, including full inventory and survey data. 7

Floodplain Modifications

The DEIR states concludes (p. 4.5-48) that although the project would not result in significant increases in the velocity of Santa Clara River flows, "localized increases" in velocity "at and immediately downstream of the Long Canyon Road Bridge" require construction of over one mile of bank protection on the river's south bank. As discussed above, the DEIR incorrectly describes the south bank stabilization as a project design component when it should be regarded as a mitigation measure. This bank stabilization is proposed for a location that will provide flood control benefits for a future phase of the Newhall Ranch project. In the Floodplain Modification section, where one would expect to find an analysis supporting the necessity of the downstream bank stabilization for the Landmark Village project, the DEIR fails to provide an adequate justification for the south bank stabilization. The analysis in the DEIR does not match the mitigation. 8

In effect, the DEIR is proposing to create a massive bank stabilization infrastructure in response to a localized impact that it concludes is below the applicable significance threshold (p. 4.5-49). The bank stabilization will itself have significant temporary and permanent impacts on riparian vegetation that must be removed to construct the protection. Most of these impacts are avoidable if the south bank stabilization is strictly limited to what is necessary to mitigate the project's significant localized impacts on velocity, if any. The DEIR must fully and accurately disclose the extent of the localized velocity increases and propose mitigation measures that are proportionate to the impact, rather than excessive bank stabilization that is designed to serve future, unapproved development. 9 10

Conversely, if the "localized" effects of the project are sufficiently significant to require a massive downstream bank protection structure, the DEIR's conclusions regarding the project's impacts on aquatic species, such as the endangered unarmored threespine stickleback, are suspect. 11

Similarly, while localized hydrological effects of the project may require localized protection for the utility corridor, the less than significant impacts disclosed in the DEIR do not warrant the nearly one mile length of bank stabilization proposed on the north bank. Like the south bank protection, this bank armoring will have temporary and permanent impacts on riparian vegetation, and a reduction in the extent of this protection to make it proportionate to the localized impact will likely reduce the project's biological impacts. 12 13

The DEIR fails to consider the project's consistency with the Los Angeles Regional Water Quality Control Board's Hydromodification Resolution (California Regional Water Quality Control Board, Los Angeles Region Resolution 2005-002, January 27, 2005). The resolution sets out a two-step process for the Regional Board to evaluate and consider further action to control adverse impacts from "hydromodification," which is defined as the "alteration *away from a natural state* of stream flows or the beds or banks of rivers, streams, or creeks, including ephemeral washes, which results in hydrogeomorphic changes." The resolution also affirms, 14

among other things, that the Regional Board will issue Clean Water Act section 401 certification only if an adequate range of alternatives have been analyzed pursuant to federal and state law, including CEQA.

Numerous elements of the Landmark Village project implicate the Hydromodification Resolution, including the project's development of an existing floodplain, extensive bank stabilization of the Santa Clara River and tributaries, and construction of the Long Canyon Bridge. The DEIR should evaluate each of these elements in light of the Hydromodification Resolution. 14

Biological Resources

Sensitive plant communities: It is not clear why coastal sage scrub and elderberry scrub are no longer considered sensitive plant communities (p. 4.4-37). The DEIR states that the previous CDFG list of terrestrial natural communities has been superseded by the September 2003 List of California Terrestrial Natural Communities, but the mere adoption of a more recent list cannot be used as the sole criterion for determining sensitivity. 15

Fuel modification zones: As discussed above, the DEIR does not account for the direct and indirect effects of fuel modification zones, which will essentially extend the Project's footprint by 50 to 200 feet. Areas subject to fuel modification requirements cannot be considered or managed as conservation areas due to the repetitive clearing requirements that may be imposed. Fuel modification zones should be fully disclosed in the DEIR so their environmental effect can be understood. 16

Proposed buffers for riparian vegetation are inadequate in the areas where they are most vital. The area south of the central part of the Project but north of the Santa Clara River contains a dense riparian forest, a natural community that is rare in southern California and growing rarer. Based on Figure 4.4-7, the buffer appears to be less than 200 feet wide in this critical area. In addition, bank stabilization structures and fuel modification zones may encroach further into the buffer area, further limiting the ability of the buffer to shield sensitive riparian habitat. The buffer should be expanded to a minimum of 500 feet in all areas, measured from the outer edge of fuel modification zones to edge of bank stabilization, rather than the minimum 70-100 feet measured from lot line to edge of bank stabilization proposed in the DEIR. There is no support in the DEIR for the claim that "the proposed riparian buffers are sufficient to maintain the function and values of the adjacent riparian habitat and to protect the diversity of riparian-associated wildlife areas occurring within these areas." (p. 4.4-61.) On the contrary, the DEIR concludes that the Project will result in significant indirect impacts on offsite habitat due to increased human and domestic animal presence (p. 4.4-91). This adverse impact can be further reduced by placing more distance between the Project and the affected riparian vegetation. 17

Coastal sage scrub impacts: the DEIR identifies the permanent destruction of 267.27 acres of coastal sage scrub as a significant unavoidable Project impact. The DEIR fails to explain why this impact is unavoidable or at least unmitigable. While avoidance is the preferred means of 18

reducing impacts to sensitive habitat, offsite restoration or purchase of mitigation credits may be available options. These mitigation options must be considered and evaluated before the impact is dismissed as unavoidable. 18

Undescribed species of everlasting: the DEIR concludes that impacts to the undescribed species of everlasting found on the Project site will be less than significant with implementation of proposed mitigation measure LV 4.4-20. This measure, however, leaves open the possibility that full avoidance of the plants is impossible, resulting in salvage of individuals and seeds ("If, due to project design constraints, avoidance of all plants is not possible …" DEIR at p. 4.4-134). Salvage is not full mitigation, since it will result in elimination of existing habitat with no assurance that replacement individuals or populations can be established. The DEIR must propose firm avoidance and/or mitigation measures or the impact must be described as significant. 19

Slender mariposa lily: the DEIR refers to Figure 4.4-6 for the location of the estimated 887 individual slender mariposa lily plants that would be destroyed by the project. Figure 4.4-6 does not provide the location of the affected plants, nor can we find any map in the DEIR that clearly describes the location of this population. The DEIR must be revised to include this information to allow a better understanding of how the impact could be avoided by project design changes. 20

The DEIR relies on mitigation measure LV 4.4-19 for potential slender mariposa lily impacts. This measure involves the development of a future mitigation plan for the slender mariposa lily, including identification of mitigation sites within protected/preserve areas of the Specific Plan. Because of the high probability of failure of similar mitigation efforts involving the establishment of plants in areas that are currently unoccupied, the standards described in the DEIR are insufficient to guarantee a reasonable probability of success. At a minimum, the mitigation plan should be made available for public review and comment prior to project approval, not merely prior to grading. A mitigation ratio considerably higher than one to one should be used given the uncertainty of this type of mitigation. In addition to the higher mitigation ratio, the plan should expressly include multiple locations to enhance the probability of success. 21

Pierson's morning glory: the DEIR fails to quantify the anticipated impact to this CNPS List 4 species. The DEIR states (p. 4.4-66) that the Pierson's morning glory "has been documented on the project site within the off-site grading sites" but then states that the species "occurs throughout the Specific Plan area on virtually all ridges and slopes." The DEIR must provide some indication of the magnitude of the impact, particularly in light of direct and cumulative impacts that are likely due to this project and future phases of the Specific Plan. In addition, the DEIR cannot simply conclude that impacts to the Pierson's morning glory are less than significant because the species is not listed, proposed for listing, or subject to threats on a statewide basis -- it must also consider the local rarity of the species. Indeed, local rarity may qualify a species as a "rare" species pursuant to CEQA, since CEQA rare species include those that "[a]lthough not presently threatened with extinction, the species is existing in such small numbers throughout all or a significant portion of its range that it may become endangered if its environment worsens." (CEQA Guidelines § 15380(b)(2).) The DEIR paradoxically treats the 22

Pierson's morning glory's presence on the CNPS "watch" list as an invitation to ignore the species. Instead, this status should be the basis for disclosing the project's impacts and avoiding or minimizing these impacts.[1] 22

San Fernando Valley spineflower: any evaluation of the project's potential impacts on and mitigation for the San Fernando Valley spineflower is premature until a final conservation plan for the species is developed by the Army Corps of Engineers and California Department of Fish and Game. The cumulative impacts of the project in combination with future development cannot be evaluated with any certainty until the final conservation plan is developed. This plan will likely supersede or supplement the Specific Plan mitigation measures relied on in the DEIR. 23

Oaks and Oak Woodland: the enhancement or creation of 4.45 acres of oak woodland on land that is already protected within the High Country SMA is inadequate mitigation for the destruction of 4.45 acres of intact, mature coast live oak woodland. The proposed mitigation does not specify the enhanced/created oak woodland habitat must be coast live oak woodland, so there is no assurance that the mitigation will be in-kind. In addition, uncertain success rate for this type of mitigation and the temporal impact associated with elimination of mature oak trees, the mitigation ratio for this impact should be much higher than 1:1 and at least 5:1. 24

Aquatic species: The project-specific mitigation measures proposed for impact to aquatic species including the Santa Ana sucker, unarmored threespine stickleback, arroyo chub, arroyo toad, two-striped garter snake, and southwestern pond turtle, do not fully avoid or reduce the project's potential impact. At a minimum, the DEIR should consider additional measures requiring that any construction associated with bank stabilization and bridge construction be conducted during a season or seasons that minimize impacts to threatened and endangered species. 25

Riparian bird species: Mitigation Measure LV 4.4-8 provides for weekly surveys for nesting/breeding birds within 30 days of construction or grading that would occur during the nesting/breeding season. While these pre-construction surveys should still be performed, the proposed mitigation should prioritize avoidance by prohibiting construction or grading activities within 300 feet (500 feet for raptors) during nesting/breeding season for threatened, endangered, and otherwise protected species. 26

Riparian vegetation: because the riparian revegetation plan has not yet been prepared and circulated for public review, it is impossible to evaluate the type, location, and effectiveness of the proposed mitigation. While this lack of detail may be defensible at the Specific Plan level, it is not at the current tract map phase. The project will result in direct, permanent impacts to 0.58 27

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1 CNPS expressly states that because many List 4 plants are locally significant, it "strongly recommend[s] that List 4 plants be evaluated for consideration during preparation of environmental documents relating to CEQA." *See* http://www.cnps.org/programs/Rare_Plant/inventory/names.htm (last viewed February 20, 2007).

acres of southern willow scrub, 8.78 acres of southern cottonwood-willow riparian forest, 0.12 acres of valley freshwater marsh, and 4.27 acres of scalebroom scrub. In addition, the project will result in "temporary" impacts to an additional 6.05 acres of southern willow scrub, 9.04 acres of southern cottonwood-willow riparian forest, 0.75 acres of valley freshwater marsh, and 2.67 acres of scalebroom scrub. The temporary impacts will still result in the elimination of existing vegetation, and should be considered long-term impacts, particularly in the case of the destruction of mature riparian forest. The project will also result in the elimination of other sensitive riparian habitat including 0.08 acres of alluvial scrub, inaccurately described as a common plant community in the DEIR. The complete riparian revegetation plan must be available for public review and comment prior to approval of the project. 27

ORV use: The DEIR does not adequately account for indirect effects associated with increased off-road vehicle (ORV) use of the Santa Clara River bed and other sensitive areas that the Project will facilitate. ORV trespass associated with increased access and adjacent residential development has been well documented in portions of the Santa Clara River subject to the Natural River Management Plan. This potential impact is not sufficiently disclosed in the DEIR's discussion of increased human presence. Feasible mitigation measures are available to reduce this impact, including vehicular barriers, limited access points, and active patrols. This impact must be discussed, and the DEIR must include mitigation measures to reduce or eliminate the impact. 28

Indirect effects: The DEIR concludes that indirect effects associated with increased human and domestic animal presence will be significant and unavoidable after implementation of proposed mitigation measures. The DEIR, however, fails to consider additional feasible measures that could reduce or avoid these impacts including, as discussed above, increased buffer or setback distances from affected resources. 29

Consistency with General and Specific Plan

The main DEIR volume contains no comprehensive analysis of the project's consistency with applicable General Plan and Specific Plan policies or SEA compatibility criteria. The project is not merely a tract map approval consistent with a Specific Plan that has been found to be consistent with the County's General Plan – it also includes a General Plan Amendment and a Specific Plan Amendment (DEIR, pp. 1.0-3 – 1.0-4). Although the project amends the General Plan and Specific Plan, we were unable to find an portion of the DEIR that re-evaluates the Specific Plan's consistency with the General Plan or the project's compatibility with the SEA policies of the General Plan. This analysis must be included in the DEIR given the plan amendments. The Specific Plan consistency analysis is relegated to an appendix to the DEIR and merely functions as a checklist and contains little real analysis. 30

For example, Specific Plan Resource Conservation Objective No. 4 is to "Preserve significant stands of oak trees." The implementation comment merely observes that "Oak Trees will be transplanted or replaced consistent with the Newhall Ranch Specific Plan approval." This response does not explain how the project is consistent with Specific Plan Resource 31

Conservation Objective No. 4 in light of the project's removal of 4.45 acres of coast live oak woodland. 31

A complete discussion of the project's consistency with all applicable General Plan, Specific Plan, and SEA compatibility should be included in the body of the DEIR with full analysis. 32

Alternatives

The DEIR's analysis of alternatives indicates that the project's objectives are either too narrowly defined or too narrowly applied, or perhaps both. According to CEQA, an EIR must describe a range of alternatives that would feasibly obtain most of the project objectives. (CEQA Guidelines § 15126.6(a).) This requirement is not only a limitation on the range of alternatives – it is a limitation on how narrowly the project objectives can be defined and applied. The analysis of alternatives in the CEQA process should not be used to justify the preferred project by eliminating a set of straw men that cannot possibly be adopted based on the defined project objectives, but that is precisely what the DEIR does. 33

In some cases, the project objectives are clearly drawn too narrowly. For example, Land Use Planning Objective 1 ("Implement a portion of one of the distinct villages within the Newhall Ranch Specific Plan to allow for residential, mixed-use, and commercial development…") can logically be satisfied only by a component of the Newhall Ranch Specific Plan. 34

Besides two No Project alternatives (one of which, Alternative 2, turns out to involve unknown future development), the DEIR discusses only two project alternatives. Alternative 3 would avoid development in the FEMA 100-year floodplain, while Alternative 4 would provide more clustered development that avoids the western portion of the site. The DEIR concludes that Alternative 3 would not meet many of the project objectives, but this conclusion is based on an extremely narrow application of the project objectives and is highly biased in favor of the project objective. 35

For example, the DEIR concludes (p. 5.0-18) that Alternative 3 is not consistent with Land Use Planning Objective No. 2 because it "would significantly reduce housing and commercial uses, and therefore reduce accommodations for projected regional growth." By the DEIR's approach, any alternative that does not provide a level of residential and commercial development at or near that of the proposed project could be rejected. Yet a reduced scale alternative like Alternative 3 would still "accommodate" projected regional growth - to a lesser extent than the preferred project, perhaps, but the preferred project itself cannot accommodate all regional growth, and the Objective No. 2 is not drafted as a quantitative goal. There is no basis for rejecting Alternative 3 based on Objective No. 2. 36

The DEIR further concludes that Alternative 3 is not consistent with Land Use Planning Objective No. 4 because it "would create a fragmented area of agricultural property adjacent to residential and commercial uses." The DEIR does not explain, however, how the "development and transitional land use patterns" under Alternative 3 would conflict with surrounding 37

communities and land uses any more than with the preferred project, which would place residential and commercial development in the midst of undeveloped open space and agricultural land. The DEIR also fails to explain why Alternative 3 necessarily requires creation of a "fragmented area of agricultural property" rather than a more compatible transitional land use that avoids any possible conflict with Objective No. 4. 37

The DEIR concludes that Alternative 3 is not consistent with Land Use Planning Objective No. 5 because it "would result in a substantial reduction in residential units (approximately 20 percent reduction), thereby reducing housing options for the site." Objective No. 5 is to "Establish land uses that permit a wide range of housing densities, types, styles, prices, and tenancy (for sale and rental)." Although Alternative 3 reduces the number of residential units, it does not dictate any change in the *range* of housing densities, types, styles, etc. Presumably, if the intended objective were to build a project with 1,444 residential units, commercial development, and infrastructure substantially identical to the proposed project, the objectives would say so. Since the objectives cannot be defined or applied so narrowly under CEQA, alternatives that generally meet the objectives (or could meet the objectives) may not be arbitrarily dismissed. 38

The DEIR concludes that Alternative 3 is not consistent with Land Use Planning Objective No. 7 and Mobility Objective No. 1 because the alternative eliminates most of the commercial uses "that are necessary to promote livability of the project and creation of a pedestrian friendly environment and enhanced pedestrian access between land uses." Here, the DEIR assumes, with no analysis whatsoever, that the preferred project will promote a pedestrian friendly environment because residents will both live and work on site. This assumption is no more valid than the contrary assumption that the commercial development of the preferred alternative will increase cross-commuting; that is, that project residents will commute to work off-site, while non-residents will commute to work on-site. Absent some evidence indicating that the inclusion of commercial development within the project will decrease automobile use and increase pedestrian compatibility, the DEIR cannot arbitrarily conclude that reduced scale alternatives that will reduce cross-commuting do not meet Land Use Planning Objective No. 7 and Mobility Objective No. 1. 39

Similar defects run through the entire analysis of both alternatives' consistency with project objectives. The analysis should be completely revised to provide an objective evaluation of the alternatives. Project objectives that are too narrow to sustain anything but the preferred project or something close to it should be rejected. In addition, the range of alternatives should be expanded so that there is a range of alternatives that meet most or all of the project objectives consistent with CEQA. For example, the DEIR concludes (p. 5.0-19 - 5.0-20) that Alternative 3 is inconsistent with Parks, Recreation, and Open Area Objective No. 2 "because it would result in a substantial reduction in trails and paseos on the project site." Accordingly, the DEIR should also evaluate a variant of Alternative 3 that does not involve a substantial reduction in trails and paseos on the project site. In other words, the DEIR must discuss alternatives that meet the basic project objectives. If Alternative 3 does not, additional alternatives must be designed that do. 40

Energy Use and Conservation

The DEIR's "Utilities" section is wholly lacking the detailed discussion of energy conservation through design expected at the tract map stage and recommended by CEQA Guidelines Appendix F. This section should be thoroughly revised and expanded to include a meaningful analysis of the project's impacts on energy use and to consider specific measures to reduce this use consistent with CEQA Guidelines Appendix F.

The DEIR's discussion of electrical demand does not contain a meaningful analysis of the project's potential impact. The DEIR concludes (p. 4.19-6) that the project will have a less than significant impact on electrical power demand because the increased demand associated with the project at full occupancy can be met by available sources. This conclusion, however, is based on supply and demand projections for 2010. It is likely that the project will not yet be built in 2010, much less achieve full occupancy. As a result, the DEIR understates the direct and cumulative impacts on electrical demand at full project buildout and occupancy, and the DEIR's conclusion of no significant impact is invalid. The DEIR should be revised and recirculated to include an accurate projection of electrical supply and demand through at least 2025 and a thorough analysis of the project's impact. This analysis should include the project's anticipated peak electrical demand, and the DEIR should evaluate the potential for reducing this peak demand consistent with CEQA Guidelines Appendix F. 41

The DEIR analyzes (p. 4.19-8) the project's natural gas consumption based on the Southern California Gas Company's ("SCGC") prediction in the 2002 California Gas Report that demand for gas within SCGC's service area will drop by 6% to 1109 billion cubic feet by the year 2022. More recently, however, SCGC projects that the gas demand from all sectors will increase at an annual rate of 0.15% between 2006 and 2025.[2] The DEIR's conclusion that the project's impact will be less than significant because the increased consumption of natural gas associated with the project at occupancy will be accommodated by available sources of supply is therefore invalid. The DEIR should be revised and recirculated accordingly. 42

The DEIR vaguely describes (p. 4.19-9) the route for the proposed gas distribution system that would serve the project, but does not describe whether trenching or other disturbance of sensitive habitat will be required. The DEIR must provide a more detailed analysis of the location and potential impacts of the gas distribution system. 43

The DEIR proposes only a set of mitigation measures adopted in connection with the Specific Plan. Since the project will likely have undisclosed significant energy impacts beyond those anticipated in the specific plan due to the faulty demand analysis described above, the DEIR should include project-specific mitigation measures consistent with CEQA Guidelines Appendix F. In particular, the DEIR should consider additional measures to reduce wasteful, inefficient, and unnecessary energy consumption during project construction and operation, including residential designs that minimize energy consumption, designs that maximize passive heating 44

2 2006 California Gas Report, p. 50.

and cooling opportunities, increased planting of native shade trees, and the installation of rooftop solar panels and/or tiles. The DEIR should evaluate the potential of siting, orientation, and design to minimize energy consumption, including transportation energy. The DEIR should specifically consider designs that meet or exceed the U.S. Green Building Council's LEED certification requirements. Consistent with CEQA Guidelines Appendix F, the DEIR should explain why certain measures were incorporated in the project and why other measures were dismissed. The DEIR currently contains none of this discussion, and its vague reliance on the California Energy Commission's Energy Building Regulations does nothing to inform decisionmakers and the public of how the project will reduce energy consumption. 44

The DEIR Fails to Analyze and Mitigate the Project's Greenhouse Gas Emissions

Aside from a brief reference to global warming as a condition "possibly affecting regional climate conditions," (p. 4.9-19) the DEIR makes no mention of climate change, greenhouse gases or global warming. This is a significant omission and must be remedied in a revised DEIR. Concentrations of greenhouse gases are increasing in the earth's atmosphere, primarily from society's burning of fossil fuels for energy and destruction of forests for other human activities. These gases cloak the earth like a blanket, absorbing solar radiation that would otherwise be radiated back into space, causing the earth's climate to warm much like the interior of a greenhouse. This phenomenon is called global warming and is leading to profound changes in the earth's climate. The world's leading scientists agree that society's production of greenhouse gases, including carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O), is responsible for the unprecedented rate of warming observed over the past century. (ACIA 2004; IPCC 2001).

Carbon dioxide accounts for approximately 85% of total emissions, and methane and nitrous oxide together account for almost an additional 14%. Because of the persistence and mixing of these gases in the atmosphere, emissions anywhere in the world impact the climate everywhere equally. Therefore, the impact of greenhouse gas emissions produced in California (the 12th largest emitter in the world) will impact not only California, but the rest of the world as well. In the absence of substantial reductions in greenhouse gas emissions, global warming and its impacts on human health, the environment, and the economy will rapidly worsen in this century. 45

Attached at Appendix A is detailed information on the global implications of climate change and greenhouse gas emissions including the following: the rising temperatures as a result of global warming; the impacts of global warming generally; the impacts of global warming on threatened, endangered, rare, and special status species outside California; and the economic cost of carbon.

A. California Laws Require the Analysis and Reductions of Green House Gases

The DEIR must analyze the impacts posed by greenhouse gas emissions resulting from the Project. The State of California recognizes the threats posed by global warming. To address and rectify the State's increasing contributions to greenhouse gas emissions the State of California has enacted requirements for state and local agencies to address the issue of global warming by analyzing and reversing the emissions of greenhouse gases. Executive Order S-3-05 calls for

greenhouse gas emission reductions and analysis of the impacts of climate change. The legislature and the Governor again reaffirmed their commitment to address the issue of climate change by passing the "The California Global Warming Solutions Act of 2006." AB 32. Despite the recognized threats posed by global warming and the implications for the community the DEIR fails completely to discuss the projects contribution to greenhouse gas emissions.

California is extremely vulnerable to the impacts of global warming and is also responsible for a significant portion of the U.S. and global emissions of greenhouse gases. The significant risks climate change poses to California as well as the considerable benefits the state could realize if it addresses these risks prompted Governor Schwarzenegger to issue Executive Order S-3-05 on June 1, 2005. *See* F.Chung et al. 2006 at Appendix 1.7. The Executive Order called for specific emissions reductions and a periodic update on the state of climate change science and its potential impacts on sensitive sectors, including water supply, public health, coastal areas, agriculture and forestry. The Executive Order established the following greenhouse gas (GHG) emissions targets: by 2010, reduce GHG emissions to 2000 levels; by 2020, reduce GHG emissions to 1990 levels; and by 2050, reduce GHG emissions to 80 percent below 1990 levels.

In response to Executive Order S-3-05, the California Environmental Protection Agency (CalEPA) formed a Climate Action Team with members from various state agencies and commissions. The Team has issued a series of reports, including a March 2006 Climate Action Team Report to Governor Schwarzenegger and the Legislature. This and other reports issued by CalEPA, the California Energy Commission (CEC), Department of Water Resources and other California agencies are available at http://www.climatechange.ca.gov/documents/index.html and should be used by the County in preparing environmental documents under CEQA. 45

Some of the major impacts identified in recent reports include:

- Reduction of Sierra snowpack up to 90 percent during the next 100 years threatens California's water supply and quality as the Sierra accounts for almost all of the surface water storage in the state.
- Impacts to the health of Californians due to increases in the frequency, duration, and intensity of conditions conducive to air pollution formation, oppressive heat, and wildfires. Increasing temperatures from 8 to 10.4°F, as expected under the higher emission scenarios, will cause a 25 to 35 percent increase in the number of days Californians are exposed to ozone pollution in most urban areas. This will slow progress toward attainment of air quality standards and impede many of the state's efforts to reduce air pollution. Temperature increases are likely to result in an increase in heat-related deaths. Children, the elderly, and minority and low-income communities are at greatest risk.
- Potential impacts from limited water storage, increasing temperatures, increased carbon dioxide concentrations, pests and weeds threaten agriculture and its economic contribution to the state. Direct threats to the structural integrity of the state's levee system would also have immense implications for the state's fresh water supply, food supply, and overall economic prosperity.

- Erosion of our coastlines and sea water intrusion into the state's delta and levee systems may result from a 4 to 33-inch rise in sea level during the next 100 years. This will further exacerbate flooding in vulnerable regions.
- Increasing temperatures and pest infestations would make the state's forest resources more vulnerable to fires. Large and intense fires threaten native species, increase pollution, and can cause economic losses.
- Increasing temperatures will boost electricity demand, especially in the hot summer season. By 2025 this would translate to a 1 to 3 percent increase in demand resulting in potentially hundreds of millions of dollars in extra energy expenditures

CalEPA 2006; Cayan et al. 2006; Chung 2006; Drechsler et al. 2006.

The California Global Warming Solutions Act of 2006 (AB 32), acknowledges the threats of global warming and places a cap on California's greenhouse gas emissions and thus brings the state closer to meeting these targets. The state of California recognizes the significant threats to the natural environment posed by global warming:

> Global warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California. The potential adverse impacts of global warming include the exacerbation of air quality problems, a reduction in the quality and supply of water to the state from the Sierra snowpack, a rise in sea levels resulting in the displacement of thousands of coastal businesses and residences, damage to marine ecosystems and the natural environment, and an increase in the incidences of infectious diseases, asthma, and other human health-related problems.

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AB 32 § 38501(a) 2006.

Global warming will also have significant impacts on the California economy, which must be addressed by all levels of government.

> Global warming will have detrimental effects on some of California's largest industries, including agriculture, wine, tourism, skiing, recreational and commercial fishing, and forestry. It will also increase the strain on electricity supplies necessary to meet the demand for summer air-conditioning in the hottest parts of the state.

AB 32 § 38501(b) 2006. In order to address the threats and impacts of global warming the California Global Warming Solutions Act requires the state to reduce the levels of greenhouse gas emissions to 1990 levels by the year 2020. AB 32 § 38550.

CEQA requires an EIR to analyze any "significant environmental effects" of a proposed project. Pub. Res. Code § 21 100(b)(l); Cal. Code Regs., Title 14, §§ 15126(a), 15126.2(a), 15143. "Significant effect on the environment' means a substantial, or potentially substantial, adverse

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change in the environment." Pub. Res. Code § 21068. CEQA also provides that the CEQA Guidelines "shall" specify certain criteria that require a finding that a project may have a significant effect on the environment:

> (1) A proposed project has the potential to degrade the quality of the environment, curtail the range of the environment, or to achieve short-term, to the disadvantage of long-term, environmental goals.
> (2) The possible effects of a project are individually limited but cumulatively considerable. As used in this paragraph, "cumulatively considerable" means that the incremental effects of an individual project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.
> (3) The environmental effects of a project will cause substantial adverse effects on human beings, either directly or indirectly.

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Pub. Res. Code § 21083(b).

The effects of a project must be fully analyzed and mitigation imposed if any of the above triggers are reached. The Project will result in 1,444 new residences, extensive commercial development, and over 40,000 daily vehicle trips. In light of the severe impacts cars and trucks have on the level of greenhouse gas emissions in this state, clearly "has the potential to degrade the environment." *See id.*, subd. (b)(1). The cumulative effects of this project on greenhouse gas emissions, when taken in consideration with the impacts statewide of increased population and vehicular travel over the next quarter century, are undeniable. *See id.*, subd. (b)(2). Finally, when considering the impacts of climate change on California, it is impossible to ignore that the impacts of this project will have either direct or indirect effects on human beings. *See id,* subd. (b)(3). Given the components of the project, and the projected increase in vehicle travel that will result, there is no question that the impacts of this Plan on greenhouse gas emissions and climate change may, and likely will, have significant cumulative environmental impacts for California. These impacts should have been considered and analyzed in the DEIR.

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B. The Impacts of Global Warming on California

The precise nature of the impacts over the next decades will depend upon whether global greenhouse gas emissions continue to increase at current rates, or whether the current rate of increase is slowed, and emissions actually reduced. Scientists model future impacts based on different emissions scenarios (Cayan et al. 2006). Under a low emissions scenario, by the end of this century heat waves and extreme heat in Los Angeles will quadruple in frequency and heat-related mortality will increase two to three times (Hayhoe et al. 2004). Alpine and subalpine forests are reduced by 50-75%, and Sierra snowpack is reduced 30-70% (Hayhoe et al. 2004). Under a higher emissions scenario, heat waves in Los Angeles will be six to eight times more frequent, with heat-related excess mortality increasing five to seven times (Hayhoe et al. 2004). Alpine and subalpine forests would be reduced by 75-90%, and snowpack would decline 74-

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90%, with impacts on runoff and streamflow that, combined with projected declines in winter precipitation, could fundamentally disrupt California's water rights system (Hayhoe et al. 2004).

As of 2002, California's main source of greenhouse gases was the transportation sector (41.2%) followed by the industrial sector (22.8%), electric power sector (19.6%), agriculture & forestry sector (8.0%), and other sources (8.4%) (CalEPA 2006). Transportation is also the main source of emissions from the Project. Mitigation of the state's emissions, therefore, will result from addressing each of the sources, with a primary focus on transportation. 49

C. The Impacts of Global Warming on Threatened, Endangered, Rare, and Special Status Species in California

Climate change is a leading threat to California and the world's biological diversity. Species have already been profoundly impacted by the worldwide average temperature increase of 1° Fahrenheit (0.6° Centigrade) since the start of the Industrial Revolution (IPCC 2001). Yet the warming experienced to date is small compared with the 2.5- 10.4° F (1.4-5.8° C) or greater warming projected for this century. The ways in which climate change threatens species are varied and sometimes complex. Below we present an overview of impacts observed to date and projections for the future.

Scientists have predicted three categories of impacts from global warming: (1) earlier timing of spring events, (2) extension of species' range poleward or upward in elevation, and (3) a decline in species adapted to cold temperatures and an increase in species adapted to warm temperatures (Parmesan and Galbraith 2004). A recent survey of more than 30 studies covering about 1600 hundred species summarized empirical observations in each of these three categories and found that approximately one half of the species were already showing significant impacts, and 85-90% of observed changes were in the direction predicted (Parmesan and Galbraith 2004). The statistical probability of this pattern occurring by chance, as opposed to being caused by climate change, is less than one in a billion (Parmesan and Galbraith 2004). 50

Changes in the life cycles and behaviors of organisms such as plants blooming and birds laying their chicks earlier in the spring were some of the first phenomena to be observed. These changes may not be detrimental to all species, but depending on the timing and interactions between species, may be very harmful.

The Edith's checkerspot butterfly, which occurs along the west coast of North America, has been severely impacted by such changes in the lifecycles of organisms. The Edith's checkerspot's host plant, *Plantago erecta*, now develops earlier in the spring while the timing of caterpillar hatching has not changed. Caterpillars now hatch on plants that have completed their lifecycle and dried up, instead of on young healthy plants (Parmesan and Galbraith 2004). The tiny caterpillars are unable to move far enough to find other food and therefore starve to death (Parmesan and Galbraith 2004). Because of this, many Edith's checkerspot butterfly populations have become extinct. Many more populations have been lost in the southern portion of the species' range than in the northern portion, resulting in a net shift of the range of the species 51

northward and upwards in elevation. All these changes have occurred in response to "only" 1.3° Fahrenheit regional warming (Parmesan and Galbraith 2004). 51

The southernmost subspecies, the Quino checkerspot butterfly, already listed as endangered under the Endangered Species Act due to habitat destruction from urban development and other impacts, has disappeared from nearly 80% of otherwise suitable habitat areas due to global warming (Parmesan and Galbraith 2004). The Bay checkerspot and Taylor's checkerspot butterflies, also listed under the Endangered Species Act, have been similarly impacted (Parmesan and Galbraith 2004). 52

Butterfly species are impacted in other ways as well. The northward expansion of the treeline into alpine meadow butterfly habitat can impede dispersal, fragment habitat, and increase mortality via bitterly collisions with the trees (Krajick 2004; Ross et al. 2005). 53

While theoretically some species can adapt by shifting their ranges in response to climate change, species in many areas today, in contrast to migration patterns in response to paleoclimatic warming, must move through a landscape that human activity has rendered increasingly fragmented and inhospitable (Walther 2002). When species cannot shift their ranges northward or to increased elevations in response to climate warming, they will become extinct (Parmesan and Galbraith 2004). Therefore, the least mobile species will be the first to disappear.[3] 54

D. <u>The DEIR Entirely Overlooks the Project's Greenhouse Gas Emissions</u>

The DEIR is inadequate because it neglects to analyze global warming and the project's greenhouse gas emissions. The CEQA Guidelines provide that, in discussing the environmental effects of a project, an EIR must include "a sufficient degree of analysis to provide decisionmakers with information which enables them to make a decision which intelligently takes account of environmental consequences." CEQA Guidelines § 15151. The Project will allow foreseeable and quantifiable emissions of carbon dioxide and other greenhouse gases during its lifetime. These emissions, although relatively small in comparison to worldwide greenhouse gas emissions, will contribute directly and cumulatively to the increase in atmospheric greenhouse gases, and will thus contribute directly and cumulatively to global warming. 55

Under CEQA, it is irrelevant that the emissions associated with the project are small in comparison to total emissions. On the contrary, CEQA's cumulative impact analysis requirement exists to capture precisely this type of impact that may be individually small but cumulatively significant. *Kings County Farm Bureau v. City of Hanford* (1990) 221 Cal. App. 3d 692, 721. ("The EIR improperly focused upon the individual project's relative effects and omitted facts relevant to an analysis of the collective effect this and other sources will have upon 56

[3] Appendix A further documents the impacts of global warming on threatened, endangered, rare, and special status species throughout the world

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air quality.") Here, the EIR completely omits any quantification of the project's cumulative contribution to the emissions of criteria pollutants, hazardous air pollutants, or greenhouse gases. A revised DEIR must calculate the project's greenhouse gas emissions, and then avoid, minimize, and mitigate them to the maximum extent feasible. In fact, many of the actions to avoid, minimize, and mitigate greenhouse gas emissions will benefit the Project in the future.

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The greenhouse gas emissions for different components of the Project must be calculated. For example, construction permitted by the Project would include, but not be limited to: (1) the greenhouse gas emissions of construction vehicles and machinery; (2) the greenhouse gas emissions from manufacturing and transporting building materials; (3) the greenhouse gas emissions of planning and design. The operation phase would include but not be limited to: (1) the greenhouse gas emission from the heating, cooling, and lighting the commercial, industrial, and residential units; and (2) the greenhouse gas emissions from the vehicle trips generated by the Project.

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The DEIR's Air Quality Section does not analyze greenhouse gas emissions, and the document as a whole contains insufficient information for the reader to estimate the project's total greenhouse gas emissions. The Traffic Access section provides Average Daily Trip numbers for the project, but does not link these numbers to greenhouse gas emissions causally related to the project. The DEIR should estimate average trip length and average fuel efficiency of the vehicles and then calculate their carbon dioxide emissions. The EPA has many different tools available for calculating emissions. They are available at: http://yosemite.epa.gov/oar/globalwarming.nsf/content/ResourceCenterToolsCalculators.html; *see also* http://pubs.wri.org/pubs_description.cfm?PubID=3756 (which contains calculators for CO_2 emissions from fuel used for heating and transportation, CO_2 emissions from purchased electricity, CO_2 emissions from business travel by air, train, bus and car, and CO_2 emissions from employee commuting). Calculation of the project's greenhouse gas emissions is the first step to then analyzing and mitigating them.

E. Climate Change Mitigation

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The project could include mitigation for these impacts. The Governor has recognized, "mitigation efforts will be necessary to reduce greenhouse gas emissions and adaptation efforts will be necessary to prepare Californians for the consequences of global warming." Executive Order S-3-05, June 1, 2005. Increased public transportation, increased support of alternative fuels and technologies, the purchase of carbon offsets (or mitigation "credits"), installation of electric vehicle charging stations, and other affirmative steps to reduce the transportation impacts of CO_2 could be considered as potential mitigation projects. These are real, achievable and available mitigation measures that could be considered when the DEIR analyzes the project's greenhouse gas emissions and their impact on climate change.

There are many avoidance and mitigation measures available to the applicant. Adopting these measures will benefit the environment, take the state closer to meeting its greenhouse gas emissions reduction targets, and demonstrate responsible development. These measures may also

save the applicant and future residents of the project money. Measures to minimize greenhouse gas emissions include:

- Following the U.S. Green Building Council's LEED (Leadership in Energy and Environmental Design) or comparable standards for energy- and resource-efficient building during pre-design, design, construction, operations and management. *See* http://www.usgbc.org and links; Alameda County 2005
- Minimizing and recycling construction-related waste
- Using salvaged and recycled-content materials for building, hard surfaces, and non-plant landscaping materials
- Maximizing water conservation measures in homes and landscaping, using drought-tolerant plants in lieu of turf, planting shade trees
- Installing the maximum possible solar energy array on the building roofs and/or on the project site to generate solar energy for the facility
- Using passive heating, natural cooling, solar hot water systems, and reduced pavement:
- Landscaping to preserve natural vegetation and maintain watershed integrity
- Installing electric vehicle charging stations at the facility
- Constructing the most energy-efficient buildings possible, to decrease heating and cooling costs
- Utilizing the combination of construction materials with the lowest carbon footprint
- Utilizing only Energy Star heating, cooling, and lighting devices, and appliances
- Ensuring that public transportation will serve the site, by constructing bus stops or other facilities and funding the transportation agency if necessary
- After all avoidance and minimization measures have been incorporated, purchasing offset credits for the project's lifetime greenhouse gas emissions

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Once all measures to avoid and minimize greenhouse gas emissions have been adopted, the project's remaining greenhouse gas emissions should be calculated, and offsets purchased to mitigate for them. There are many options for purchasing carbon offsets (or credits), including but not limited to the following:

- The Chicago Climate Exchange (http://www.chicagoclimatex.com/)
- Climate Care (http://www.climatecare.org/)
- My Climate (http://www.myclimate.org)
- Climate Friendly (http://www.climatefriendly.com/)
- The Carbon Neutral Company (http://www.carbonneutral.com/)
- The Climate Trust (http://www.climatetrust.org/)
- Renewable Choice Energy (http://www.renewablechoice.com/m/index.php)

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Purchasing mitigation credits to offset the project's unavoidable greenhouse gas emissions is entirely feasible, and is in fact becoming quite common. Early in 2006, Whole Foods announced that it would buy wind energy credits from Renewable Choice Energy to offset 100% of its electricity use (other companies purchasing these credits include Johnson & Johnson, DuPont,

Starbucks, IBM, and Safeway). FedEx Kinkos announced it would will increase its "green power" commitment by 67.5 percent to an estimated 40 million kilowatt-hours per year, and Walgreens announced it will install solar-power systems at 96 stores and two distribution centers in California. There is no reason why the project cannot mitigate for 100% of its greenhouse gas emissions once all avoidance and minimization measures have been incorporated. 60

A wealth of additional resources on calculating, avoiding, and mitigating greenhouse gas emissions is available on the internet. Several options include the David Suzuki Foundation at http://www.davidsuzuki.org/Climate_Change/What_You_Can_Do/carbon_neutral.asp and the World Resources Institute at http://pubs.wri.org/pubs_description.cfm?PubID=3756. 61

Because the project's greenhouse gas emissions are likely to be significant after calculation given even just the vehicle trips generated, a revised DEIR must consider and adopt feasible mitigation measures and/or an alternative that reduces the project's contribution of greenhouse gases to the maximum extent feasible. Not only is this required by CEQA, but it will also demonstrate the County's commitment to environmental and community leadership. 62

Conclusion

We request that the DEIR be revised and recirculated consistent with these comments and those received from other interested parties and agencies. 63

Please add me to the list of persons receiving future notices regarding this project. My mailing address is:

5656 S. Dorchester Ave. #3
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My email address is: jbuse@biologicaldiversity.org

Sincerely,

John Buse
Staff Attorney
Center for Biological Diversity

APPENDIX A- Global Implications of Climate Change and Greenhouse Gas Emissions

1. Rising Global Average Temperatures

The Intergovernmental Panel on Climate Change ("IPCC") has concluded that the global average temperature has risen by approximately 0.6° C ± 0.2 C during the 20th Century (IPCC 2001). There is an international scientific consensus that most of the warming observed has been caused by human activities (ACIA 2004; IPCC 2001). Carbon dioxide emissions, carbon dioxide concentrations, and temperature over the last 1,000 years are all correlated (ACIA 2004). Mean temperatures during the 20th century were the highest in 1,000 years (Albritton et al. 2001). Global climate has changed in other ways as well. For example, precipitation has increased by 0.5 to 1% per decade in the 20th century over most mid- and high latitudes of the Northern Hemisphere continents, and to a lesser degree over the tropical land areas in the Northern Hemisphere (IPCC 2001).

Global average temperature increases mask significant regional variation. Due to a number of positive feedback mechanisms, warming in the Arctic has been and will be greater and more rapid than in the rest of the world (ACIA 2004). Warming in the Arctic is in many ways a harbinger of what is to come in other areas. Changes already observed in some areas of the Arctic dwarf global averages. In extensive areas of the Arctic, air temperature over land has increased by as much as 5° C (9° F) over the 20th century (Anisimov et al. 2001).

All climate models predict significant warming in this century, with variation only as to the rate and magnitude of the projected warming (ACIA 2004). Determining the degree of future climate change requires consideration of two major factors: (1) the level of future global emissions of greenhouse gases, and (2) the response of the climate system to these emissions ("climate sensitivity") (ACIA 2004a). Global warming will continue and accelerate if greenhouse gas emissions are not reduced.

As hard data are not available for events that have not yet occurred, the future level of society's greenhouse gas emissions must be projected. The IPCC has produced a Special Report on Emissions Scenarios ("SRES") (Nakićenović et al. 2000) that describes a range of possible emissions scenarios based on how societies, economies, and energy technologies may evolve, in order to study a range of possible scenarios (ACIA 2004a; Albritton et al. 2001).

Climate models make different assumptions regarding how various aspects of the climate system will respond to increased greenhouse gas concentrations and warming temperatures. These differing assumptions are expressed as "climate sensitivity," defined as the equilibrium response of global mean temperature to doubling levels of atmospheric carbon dioxide (Stainforth et al. 2005). The IPCC (2001) used climate sensitivities of 1.3-5.8K for projections of warming from 1990-2100 (Stainforth et al. 2005).

Using the SRES emissions scenarios and the world's leading climate models, the IPCC predicts that the global average temperature will warm between 1.4 and 5.8°C by the end of this

century. Warming will be greater in the Arctic, where the annual average temperatures will rise across the entire Arctic, with increases of approximately 3-5° C over the land areas and up to 7° C over the oceans. Winter temperatures are projected to rise even more significantly, with increases of approximately 4-7° C over land areas and approximately 7-10° C over oceans (ACIA 2004a). Year-to-year variability is also projected to be greater in the Arctic than in other regions (ACIA 2004a).

For a number of reasons, IPCC (2001) and ACIA (2004) projections may be significant underestimates of the amount and rate of warming. First, the planet is already committed to an additional 1° F warming from the excess solar energy already in our climate system, due to lag time in the climate response (Hansen 2005). Second, actual worldwide greenhouse gas emissions may be on the high end or above the range of the IPCC scenarios. All scenarios utilized by the IPCC assume that energy use will shift away from fossil fuels to a greater percentage of sustainable energy sources and that worldwide greenhouse gas emissions will begin to decline during this century (IPCC 2001). Yet the most recent energy projections show that if current policies continue, worldwide greenhouse gas emissions will be 52% higher in 2030 than they are today (IEA 2005).

Third, climate sensitivity may be substantially greater than the levels used by IPCC (2001). Results from the *climateprediction.net* experiment indicate that much larger climate sensitivities of up to 11.5K are possible (Stainforth et al. 2005). Chapin et al. (2005) studied the warming amplification caused by the expansion of shrub and tree cover in the Arctic and resulting increase in solar absorption. This amplification could be as much as two to seven times (Chapin et al. 2005), and is not accounted for in the climate models used in IPCC (2001) (Foley 2005).

Recent data on the unexpectedly fast rate of warming in the Arctic also reinforces the likelihood that the IPCC (2001) projections will need to be revised upwards. Overpeck et al. (2005) concluded that the Arctic is on a trajectory towards an ice-free summer state within this century, a state not witnessed in at least the last million years (Overpeck et al. 2005). These scientists conclude that there are few, if any processes or feedbacks within the arctic system that are capable of altering the trajectory toward this ice-free summer state. In September, 2005, scientists reported a new record Arctic sea-ice minimum for the month of September (NSIDC 2005). These scientists called the sea ice reduction "stunning" and concluded that Arctic sea ice is likely on an accelerating, long-term decline (NSIDC 2005).

2. The Impacts of Global Warming Generally

Global warming consists of more than just increases in global average temperature. In 2001 the IPCC predicted a 90-99% chance of the following weather changes:

- Higher maximum temperature and more hot days over nearly all land areas;
- Higher minimum temperatures, fewer cold days and frost days over nearly all land areas;

- Reduced diurnal temperature range over most land areas;
- Increase of heat index over land areas;
- More intense precipitation events.

Albritton et al. 2001.

The IPCC also predicted a 66-90% chance of the following:

- Increased summer continental drying and associated risk of drought;
- Increased in tropical cyclone (hurricane) peak wind intensities;
- Increase in tropical cyclone mean and peak precipitation intensities.

Albritton et al. 2001.

Greenland ice cores indicate that the climate can change very abruptly. Scientists caution that thresholds may be reached that trigger rapid and extreme climatic changes that are difficult to predict but could be devastating. Examples include the shut down of the North Atlantic thermohaline circulation, which transfers heat from the equatorial regions to the Arctic, which could plunge northern Europe into a new ice age. The more rapid melting of the Greenlandic ice sheet, once thought to be several centuries away, could trigger this impact and also result in global sea level rise of up to six meters, completely eliminating many coastal areas. As in the case of the shift to an ice-free Arctic summer, scientists warn that we may be very close to crossing thresholds of rapid climate change from which there is no return.

Increased intensity of precipitation events due to global warming has long been predicted by climate models and remains a consistent result of the most advanced modeling efforts (Cubasch and Meehl 2001). In global simulations for future climate, extreme precipitation events over North America are predicted to occur twice as often (Cubasch and Meehl 2001).The impacts of global warming, once envisioned to be experienced by future generations, are already upon us, bringing profound climactic and ecological changes, great loss of human life, and likely extinction for many of the planet's non-human species. As written recently in the New England Journal of Medicine.

> Since [the release of the *Third Assessment Report* in] 2001, we've learned substantially more. The pace of atmospheric warming and the accumulation of carbon dioxide are quickening; polar and alpine ice is melting at rates not thought possible several years ago; the deep ocean is heating up, and circumpolar winds are accelerating; and warming in the lower atmosphere is retarding the repair of the protective "ozone shield" in the stratosphere….Given the current rate of carbon dioxide build-up and the projected degree of global warming, we are entering uncharted seas.
>
> As we survey these seas, we can see some of the health effects that may like ahead if the increase in very extreme weather events continues. Heat waves like

> the one that hit Chicago in 1995, killing some 750 people and hospitalizing thousands, have become more common. Hot, humid nights, which have become more frequent with global warming, magnify the effects.

Epstein 2005.

In 2002, more than 1,000 people died in a spring heat wave in India (Gelbspan 2004). In the spring of 2003, 1,400 people died in another heat wave in India and Pakistan. Also in 2003, a summer heat wave in Europe killed between 21,000-35,000 people (Epstein 2005).

In 1998, Hurricane Mitch dropped six feet of rain on Central America in three days, and was followed by soaring incidences of malaria, dengue fever, cholera, and leptospirosis (Epstein 2005). In 2000, after rain and three cyclones hit Mozambique over a six week time period, the incidence of malaria rose by five times (Epstein 2005). In June, 2001, Houston suffered the single most expensive storm in modern history when tropical storm Allison dropped thirty-five inches of rain in one week, resulting in $6 billion in damages (Gelbspan 2004). In November, 2001, record flooding killed more than 1,000 people in Algeria (Gelbspan 2004). Also in 2002, more than 12 million people were displaced by severe flooding in South Asia (Gelbspan 2004).

In the Eastern United States, the effect of sea level rise over the last century (primarily from thermal expansion as the oceans warm) has also exacerbated the beach erosion and flooding from modern storms that would have been less damaging in the past (Folland and Karl 2001). In August, 2005, Hurricane Katrina killed hundreds and destroyed the city of New Orleans (Epstein 2005). Katrina was quickly followed by Rita, and then Wilma, putting 2005 on track to setting a new record for hurricane season destruction.

While it may not be possible to link individual episodes to global warming, this overall pattern of increasingly violent weather is very likely linked to human-caused warming. But even more subtle, gradual changes can profoundly damage public health (Epstein 2005). During the past two decades, the prevalence of asthma in the United States has quadrupled, at least in part because of climate-related factors (Epstein 2005). Increased levels of plant pollen and soil fungi may also be involved, as experiments have shown that ragweed grown in twice the ambient levels of carbon dioxide produces 60% more pollen (Epstein 2005). High carbon dioxide levels also promote the growth and spore production of some soil fungi, and diesel particles then help to deliver these aeroallergens deep into human lungs (Epstein 2005).

Widening social inequities and changes in biodiversity caused by global warming have also contributed to the resurgence of many infectious diseases (Epstein 2005). Global warming is credited with the current spread of Lyme disease, as well as malaria, hantavirus, and West Nile virus (Epstein 2005). Floods are also frequently followed by disease clusters, as downpours can drive rodents from burrows, deposit mosquito-breeding sites, foster fungus growth in houses, and flush pathogens, nutrients, and chemicals into waterways (Epstein 2005). Droughts also weaken trees' defenses against infestations and promote wildfires, which can cause injuries, burns, respiratory illness, and deaths (Epstein 2005).

Shifting weather patterns are jeopardizing water quality and quantity in many countries, where groundwater systems are overdrawn (Epstein 2005). Most montane ice fields are predicted to disappear during this century, further exacerbating water shortages in many areas of the world (Epstein 2005).

An even greater threat to human health comes from illnesses affecting wildlife, livestock, crops, forests, and marine organisms (Epstein 2005). One recent report found that 60% of resources examined, from fisheries to fresh water, are already in decline or being used in unsustainable ways (Epstein 2005). This is a grim prognosis indeed as global population continues to rise even as global warming accelerates.

As discussed further below, global warming will also have profound impacts on the earth's biological diversity and threatens many thousands of species. The primary prevention and mitigation of all of these climate impacts is to reduce the nation's energy use and halt the extraction, mining, transport, refining and combustion of fossil fuels (Epstein 2005). Experts believe that a substantial reduction in energy use would have innumerable health and environmental benefits along with stabilizing the climate (Epstein 2005).

3. The Impacts of Global Warming on Threatened, Endangered, Rare, and Special Status Species

The pika is a small, vegetarian relative of the rabbit, which is adapted to life on high, treeless mountain peaks. Because pikas need cold, bare habitat, it is not surprising that their numbers are plummeting all over the globe (Krajick 2004). Fossil evidence shows that pikas once ranged widely over North America but their range has contracted to a dwindling number of high peaks during the warm periods of the last 12,000 years (Krajick 2004). Alpine species like the pika are unable to shift their ranges as warming temperatures and advancing treelines, competitors, and predators impact their mountain habitat (Krajick 2004). Pikas are further limited by their metabolic adaptation to their cold habitat niche, which allows them to survive harsh winters but also causes them to die from heat exhaustion at temperatures as low as 77.9° F (25.5° C) (Krajick 2004).

American pika populations at seven of twenty-five previously recorded localities in the Great Basin of the western United States have disappeared in recent years (Beever 2003). Based on work conducted in the late 1990s, researchers documented that the average elevation of surviving pika populations was 8,310 feet, up from a pre-historic average of about 5,700 feet between 7,500 and 40,000 years ago (Beever 2003; Grayson 2005). Most recently, researchers announced in December, 2005, that at least 2 additional populations have become extinct, and the average elevation of surviving populations has increased by another 433 feet.

In the Yukon, collared pikas declined 90% between 1999 and 2000, when unprecedented midwinter snowmelts, rain, and refreezing eliminated the insulating snow and then iced over the pika's forage plants (Krajick 2004). A pika species endemic to the mountains of northwest

China, discovered only in 1986, was not located in extensive surveys in 2002 and 2003 and may be extinct.

Alpine dwelling marmots which rely upon the treeless tundra to visually spot and avoid predators, are also at risk as treelines advance, providing cover for predators like wolves and cougars.

Alpine plants, which have little or no capability to shift their range to higher elevations as the climate warms, may be most at risk. One study predicts that a 3° Centigrade temperature rise over the next century will eliminate eighty percent of alpine island habitat and cause the extinction of between a third and a half of 613 known alpine plants in New Zealand (Krajick 2004).

A study of 15,148 North American vascular plants found that 7%-11% of all species (1,060 to 1,670 plants) could be entirely out of their climate envelopes with just a 5.4° F (3° C) warming, the lower limit of climate change predicted for this century by the IPCC (Morse et al. 1995). At the upper boundary of climate change predicted for this century, 10.4° F (5.8° C), the percentage of plants completely outside their envelope increases to 25-40% (Morse et al. 1995). By contrast, about 90 North American plant species are believed to have become extinct in the past two centuries (Morse et al. 1995).

Species are also at great risk because climate change can alter conditions for diseases and their vectors in a way that allows the incidence of disease to increase and spread. Global warming can exacerbate plant disease by altering the biological processes of the pathogen, host, or disease-spreading organism (Harvell et al. 2002). For example, cold winter temperatures limit disease in some areas because the cold kills pathogens. Warmer winter temperatures can decrease pathogen mortality and increase disease (Harvell et al. 2002). Warmer temperatures can also increase pathogen growth through longer growing seasons and accelerated pathogen development (Harvell et al. 2002). The most severe and least predictable disease outbreaks will likely be when climate change alters host and pathogen geographic ranges, so that pathogens introduced to new and vulnerable hosts (Harvell et al. 2002).

Climate change will also influence wildlife diseases by affecting the free-living, intermediate, or vector stages of pathogens (Harvell et al. 2002). Many vector-transmitted diseases are currently climate limited because the parasites cannot complete development before the vectors are killed by cold temperatures (Harvell et al. 2002). Well studied vector borne human diseases such as malaria, Lyme disease, tick-borne encephalitis, yellow fever, plague, and dengue fever have expanded their ranges into higher latitude areas as temperatures warm (Harvell et al. 2002).

Increased ocean temperatures also cause marine pathogen range expansions. One example is the spread of eastern oyster disease on the east coast of the United States from Long Island to Maine during a winter warming trend in which the cold-water barrier to pathogen growth was removed (Harvell et al. 2002).

A study published in *Nature* has linked the extinction of dozens of amphibian species in the tropical highland forests of Central and South America to global warming due to the creation of ideal conditions for growth of the chytrid fungus, a disease which kills frogs by growing on their skin and attacking their epidermis and teeth, as well as by releasing a toxin (Pounds et al. 2006). Seventy-four of the 110 species of brightly colored harlequin frogs of the genus *Atelopus* have disappeared in the past 20 years due to the spread of the fungus (Pounds et al. 2006). The study's lead author stated "Disease is the bullet killing frogs, but climate change is pulling the trigger" (Eilperin 2006). The golden toad (*Bufo periglenes*), endemic to the same tropical mountain forests, was also driven extinct by climate change. These amphibian extinctions from the Monteverde Cloud Forest are one of the largest recorded vertebrate extinction events of at least the last 100 years.

Projected increases in atmospheric carbon dioxide and temperature over the next 50 years will rapidly and substantially exceed the conditions under which coral reefs have flourished over the past 500,000 years (Hughes et al. 2003). Coral reefs are already experiencing a major decline (Hughes et al. 2003). Thirty percent of reefs are already severely damaged, and sixty percent of reefs could be gone by 2030 (Hughes et al. 2003). The link between increased greenhouse gases, climate change, and regional-scale bleaching of corals, questioned by some researchers as recently as ten to twenty years ago, is now incontrovertible (Hughes et al. 2003). In the face of elevated ocean temperatures, corals "bleach" by expelling the symbiotic algae that provide them nourishment. Such bleaching events are often fatal, and as they become more frequent with global warming, threaten not just individual coral species but the entire reef ecosystem.

Corals face an additional threat from greenhouse gas emissions: increasing levels of dissolved carbon dioxide in the oceans from society's fossil fuel use reduces the rate of calcification corals need for growth. The frequency and intensity of hurricanes is also projected to continue to increase, leading to a shorter time for recovery between damaging storm events (Hughes 2003). Two species of Caribbean coral, the elkhorn coral (*Acropora palmata*) and staghorn coral (*Acropora cervicornis*) have been listed under the Endangered Species Act, in part due to elevated ocean temperatures from global warming and ocean acidification from anthropogenic carbon dioxide emissions. U.S. Fish and Wildlife Service (USFWS) 2006.

Species in areas of the globe experiencing more rapid warming than the average, such as the Arctic, are also particularly vulnerable to climate change. The Arctic has warmed at over twice the rate of the rest of the world and has been impacted particularly early and intensely by climate change. Winter temperatures in parts of the Arctic have increased by as much as 3-4° C (5-7° F) in just the past 50 years. Over the next 100 years, under a moderate emissions scenario, annual average temperatures are projected to rise 3-5° C (5-9° F) over land and up to 7° C (13° F) over the oceans. Winter temperatures are projected to rise by 4-7° C (5-9° F) over land and 7-10° C (13-18°) over the oceans (ACIA 2004b:2).

The disproportionate regional warming is caused by several unique characteristics and feedback mechanisms in the Arctic. Chief among these is the decrease in Arctic snow and ice cover and northward expansion of boreal forests and shrubs as temperatures warm. These changes greatly decrease the amount of solar radiation reflected back into space and speed regional warming in a positive feedback loop of enormous magnitude. As temperatures go up, Arctic sea ice melts. Summer sea ice extent is already declining at up to 10% per year, and experienced a new record minimum in September 2005 (NSIDC 2005). An area of sea ice of about half a million square miles, or roughly twice the size of Texas, has been lost (NSIDC 2005). If current trends continue, the Arctic will be ice free in the summer in just a few decades. Decreases in winter sea ice extents in the Arctic have also been documented, approaching reductions of 3% per decade (Meier et al. 2005). The Arctic may already be on a trajectory towards a summer ice-free, "super interglacial" state that has not existed for at least a million years (Overpeck et al. 2005). There appear to be no feedback processes in the Arctic system capable of altering this trajectory towards dramatically less permanent ice than at present (Overpeck et al. 2005).

The rapid warming threatens the entire Arctic web of life, including the polar bear (*Ursus maritimus*), the largest of the world's bear species and an icon of the North. Polar bears live only in the Arctic where sea ice is present for substantial portions of the year. Polar bears are the Arctic's top predator and completely dependent upon the sea ice for all of its essential behaviors. Polar bears are specialized predators of seals in ice-covered waters. Polar bears also use the sea ice to travel, to mate, and some mothers even give birth to their cubs in snow dens excavated on top of the sea ice. The polar bear's dependence on sea ice is so complete that, like whales and seals, they are classified as a marine mammal by scientists and the federal government.

Due to the overwhelming risk to polar bears caused by global warming, in February, 2005, the conservation organization Center for Biological Diversity submitted a Petition to the U.S. Fish and Wildlife Service to list polar bears as a threatened species under the Endangered Species Act. *See http://biologicaldiversity.org/swcbd/species/polarbear/petition.pdf.* In February, 2006, the Fish and Wildlife Service found that listing of polar bears "may be warranted," and the listing process is currently ongoing. 71 Fed.Reg. 6,745 (February 9, 2006).

The number and magnitude of the impacts already recorded from a 1° F increase in average global air temperature is profoundly disturbing. And the projected increase, even under moderate greenhouse gas scenarios, for this century of 2.5- 10.4° F (1.4-5.8° C) is many times the warming already experienced. Not surprisingly, the projections for the future are more disturbing still.

The leading study on the quantification of risk to biodiversity from climate change, published in 2004 in *Nature*, included over 1,100 species distributed over 20% of the earth's surface area (Thomas et al. 2004). Under a relatively high emissions scenario, 35%, under a medium emissions scenario 24%, and under a relatively low emissions scenario, 18% of the species studied would be committed to extinction by the year 2050 (Thomas et al. 2004). Extrapolating from this study to the earth as a whole reveals that over a million species may be at

risk. The clear message is that immediate reductions in greenhouse gas emission may save preserve many thousands of species. It is also clear that some impacts from climate change are inevitable, and thus adaptation strategies will be an essential component of any comprehensive strategy to manage the impacts of climate change.

4. The Economic Cost of Carbon

The economic cost of greenhouse gas pollution is the estimated cost of the net impact on economies and societies of long term trends in climate conditions related to anthropogenic greenhouse gas emissions (Downing et al. 2005). The economic cost is generally expressed as the marginal cost of climate change impacts, and is usually estimated as the net present value of the impact over the next 100 years (or longer) of one additional ton of carbon emitted to the atmosphere today, and is expressed in dollars (or other currency) per ton of carbon (tc).4

Estimating the economic cost of greenhouse gas pollution is a rapidly developing field, and very few studies conducted to date have included any non-market damages such as species extinction, or the risk of potential extreme weather such as hurricanes, droughts, and floods (Watkiss et al. 2005). None have included socially contingent effects, or the potential for longer-term effects and catastrophic events (Watkiss et al. 2005). This indicates that values in the literature are a sub-total of the full economic (or social) cost of greenhouse gas pollution, and therefore by definition an underestimate, though researchers cannot yet say by how much (Watkiss et al. 2005).

Researchers have concluded that $64/tc (year 2000) is a reasonable figure for decision makers to use as a lower benchmark of the economic cost of greenhouse gas emissions (Downing et al. 2005). An upper benchmark is more difficult to deduce from the current literature but the risk of higher values for the social cost of carbon is significant (Downing et al. 2005, Watkiss et al. 2005). Decision makers should use the best available range of values displayed in Table 1.

Table 1: Economic Cost of Carbon: Values for Use in Project Appraisal (USD per ton carbon) (Source: Adapted from Watkiss et al. 2005:ix)5

Year of Emission	Central guidance	Lower Central Estimate	Upper Central Estimate
2000	$101	$64	$238
2010	$119	$73	$293
2020	$146	$91	$375
2030	$183	$119	$475
2040	$256	$165	$603

4 The cost can also be expressed per ton of carbon dioxide, where 1tc=3.664t CO_2.
5 Figures from Watkiss et al. 2005:ix were converted from GBP (£) to USD ($) with the exchange rate calculator at http://coinmill.com/GBP_USD.html on July 18, 2006 and rounded to the nearest dollar.

2050	$384	$238	$768

Using the central guidance figure and the year 2010 baseline, the cost per ton of CO_2 would be $32.48. This measure, as well as qualitative measures of environmental and social impacts must be analyzed in the DEIR and taken into consideration when determining what is and is not a feasible mitigation measure or alternative.

D21. Letter from Center for Biological Diversity, dated February 20, 2007

Response 1

This comment is an introduction to comments that follow. No further response is required.

Response 2

The comment states that the County's review of the Landmark Village project should be stayed pending completion of the U.S. Army Corps of Engineers and the California Department of Fish and Game (CDFG) permitting process for the EIS/EIR project. For information response to this comment, please refer to **Topical Response 2**: EIS/EIR Project.

Response 3

The comment refers to the Landmark Village Draft EIR, Section 1.0, Project Description. The comment states that the applicant is proposing to construct the Long Canyon Road Bridge as part of the Landmark Village project; however, the bridge "does not provide access to the project, but connects the project to future unapproved phases of Newhall Ranch." The comment requests that the bridge be deleted from the project description and associated approvals. The County does not concur with these comments.

As stated in the Draft EIR, Section 1.0, p. 1.0-48, as part of the project approvals for the Newhall Ranch Specific Plan, the County approved program-level CUP No. 94-087-(5) on May 27, 2003. The CUP approved three elevated highway bridge crossings over the Santa Clara River, including the general alignment for the Long Canyon Road Bridge. Each bridge crossing is an extension of an existing road, creating a functional regional circulation system for Newhall Ranch, including Landmark Village, the first phase of the Newhall Ranch community. The location of the Long Canyon Road Bridge and associated bank protection is shown in Figure 1.0-23 of the Draft EIR, Section 1.0, Project Description.

The elevated Long Canyon Road Bridge crosses the Santa Clara River and will serve as a portion of the circulation system for other portions of Newhall Ranch. These other portions are not "future unapproved phases of Newhall Ranch." Commencing in 1994, and concluding in May 2003, the County embarked upon the preparation of a comprehensive Specific Plan for the entire Newhall Ranch. The Specific Plan was one of several project approvals covering the entire Newhall Ranch area. The environmental implications of the Specific Plan and associated project approvals were addressed in a comprehensive program EIR (see, Newhall Ranch Specific Plan Program EIR). Both the Specific Plan and associated Program EIR were approved by the County's Board of Supervisors on May 27, 2003. Thus, the entire Land Use Plan for Newhall Ranch has been studied, debated, and approved as of May 2003. Nothing

precludes the applicant from implementing various components of the approved Specific Plan, including the Landmark Village project and associated infrastructure, such as the Long Canyon Road Bridge and buried bank stabilization.

In addition, as disclosed in the Draft EIR, Section 4.2, Hydrology, at p. 4.2-35, buried bank protection along portions of the Santa Clara River (see, Draft EIR, Figure 1.0-23) is needed to protect the residential and commercial development on the Landmark Village project site, the Long Canyon Road Bridge, and the property immediately downstream of the Landmark Village site from potential localized erosion due to project implementation. Thus, it is deemed both appropriate and desirable to install infrastructure (i.e., bridge, bank protection) in conjunction with the grading and construction associated with the Landmark Village tract map site. The Draft EIR, Section 4.2, p. 4.2-42, disclosed that localized increases in velocity in excess of 4 feet per second (fps) in a capital event would occur downstream of the Landmark Village project site and that such localized increases in velocity have the potential to cause erosion. The project-related increases in velocity downstream of the project site would be mitigated by installation of buried bank stabilization/protection along the southern edge of the river corridor at the Long Canyon Road Bridge and extending both east and west (see, Draft EIR, Figure 1.0-23). The biological and aquatic impacts associated with that bank stabilization were previously analyzed and accepted by the County in the certified Newhall Ranch Program EIR. Such impacts are further analyzed at the Landmark Village tract map level as part of this EIR. (Please see, specifically, Section 4.2, Hydrology, revised **Section 4.4, Biota**, and Section 4.5, Floodplain Modifications.)

Response 4

The comment refers to the Landmark Village project's buried bank protection starting at the Long Canyon Road Bridge and extending westerly downstream of the tract map site. The comment correctly states the Draft EIR's disclosure that downstream buried bank protection is needed to mitigate potential localized erosion impacts associated with implementation of the project. On that basis, the comment concludes that because the buried bank protection is viewed as "mitigation," it cannot also be included as a component of the Landmark Village project. The comment reflects an unnecessarily narrow characterization of the buried bank protection. In the County's view, the buried bank protection can serve as both a project component and a form of mitigation to reduce or minimize the potential for localized erosion. And, nothing in CEQA precludes the buried bank protection from being included as a component of the project (i.e., a project design feature) and a form of mitigation to minimize the potential for localized erosion in large storm events -- particularly where, as here, the entire Specific Plan was the subject of a previously certified programmatic environmental document that included the Newhall Ranch land plan and associated infrastructure (e.g., tract maps, bridges, bank protection, etc.).

Response 5

The comment states that, because "the downstream bank stabilization also functions as flood protection for future, unapproved development, the DEIR must fully disclose the impacts associated with the project and the Long Canyon Bridge," including mitigation and alternatives. First, the downstream buried bank stabilization does function as protection against large storm events and associated erosion downstream of the Landmark Village tract map site; however, both the bank stabilization and bridge were analyzed in the previously certified Newhall Ranch Specific Plan Program EIR and, again, in this EIR. Second, the County already has approved the entire land use plan for Newhall Ranch; and, as a result, there is no "future, unapproved development" within the Specific Plan boundary. Finally, please see the Draft EIR, Section 4.2, Hydrology, revised **Section 4.4, Biota**, and Section 4.5, Floodplain Modifications for an assessment of impacts associated with the Landmark Village project, including Long Canyon Road Bridge and the buried bank stabilization.

Response 6

The acreage of the fuel modification zone, which is expected to extend approximately 100 feet from structures, was included in the calculations of impacts to on-site biological resources as part of the development footprint. Even so, most of the fuel modification zone for the Landmark Village project occurs within agricultural areas and will not result in additional impacts to native vegetation. For further responsive information, please see this Final EIR, **Appendix A** [Preliminary Fire Management Plan (Dudek 2007)].

Response 7

The requested changes have been made to reflect the Center for Biological Diversity's comments. Please refer to the Final EIR **Section 3.0, Revised Draft EIR Pages**, for the requested revisions. Specifically, the Draft EIR, Section 4.4, Biota, has been revised to include a description of plant communities and associated special-status plant and wildlife species occurring, or potentially occurring, in areas surrounding the project site (see, Final EIR, revised **Section 4.4, Biota, subsection F. Characteristics of Surrounding Areas**, p. 59). As described in the Draft EIR, Table 4.4-3 (see also, **Table 4.4-3** in the Final EIR, revised **Section 4.4, Biota**, pp. 4.4-13–4.4-17), numerous biological surveys have been conducted on the Newhall Ranch Specific Plan area (inclusive of the Landmark Village project site) and the survey reports are included in Appendix 4.4 of the Draft EIR and **Appendix A** of this Final EIR.

Response 8

Please see **Responses 3, 4**, and **5**, above.

Response 9

Please see **Responses 3**, **4**, and **5**, above. In addition, the buried bank protection downstream of the Long Canyon Road Bridge, which is located on the south side of the Santa Clara River, borders an active agricultural field (see Draft EIR, Figure 1.0-23) and, impacts to riparian vegetation in that area would be mitigated through revegetation/restoration efforts after installation of the buried bank protection.

Response 10

Please see **Responses 3**, **4**, and **5**, above.

Response 11

Please see **Responses 3**, **4**, and **5**, above. In addition, the buried bank protection is not fairly characterized as "massive" as it extends westerly downstream from the Long Canyon Road Bridge. In fact, as disclosed in the Draft EIR, p. 1.0-53, approximately 6,400 linear feet of buried bank protection would be located on the south bank of the river, beginning at the Long Canyon Road Bridge and extending both east and west. The Draft EIR's conclusions regarding the project's impacts on aquatic species are not "suspect." For a detailed analysis of impacts on aquatic species due to the Landmark Village project, including the Long Canyon Road Bridge and buried bank stabilization, please see revised **Section 4.4, Biota**; and see, Section 4.2, Hydrology, and Section 4.5, Floodplain Modifications. The Draft EIR, Appendix 4.5, also includes the Entrix report, which assesses project-related impacts on special-status aquatic species. Finally, this issue was extensively addressed in the previously certified Newhall Ranch Specific Plan Program EIR.

Response 12

The comment is critical of the bank stabilization proposed along the north bank of the river. For information responsive to this comment, please see **Responses 3**, **4**, and **5**, above.

Response 13

Please see **Responses 3**, **4**, and **5**, above.

Response 14

Because the Landmark Village project implements a part of the Newhall Ranch Specific Plan, the Landmark Village Draft EIR is tiering from the certified Newhall Ranch Revised Draft Program EIR (March 1999) and Revised Additional Analysis (May 2003) in accordance with Public Resources Code section 21093(a) and *CEQA Guidelines* Section 15168(c). Public Resources Code section 21093 encourages a lead agency to "tier" from a previously certified program EIR, whenever feasible. (*CEQA Guidelines*

Sections 15168(c), 15385). Cumulative impacts on the Santa Clara River associated with development of the entire Newhall Ranch Specific Plan were fully evaluated in the certified Newhall Ranch Specific Plan Program EIR as well as the Landmark Village Draft EIR, Sections 4.2, Hydrology, and 4.5, Flood Modifications.

The comment requests further clarification of cumulative hydromodification impacts of the Landmark Village project in relationship to other projects in the Santa Clara watershed, and specifically assessment of the "total miles of hydromodification from all the projects of the Specific Plan." The term hydromodification is very broad, and can refer both to physical alterations to natural drainages and to adverse affects on natural receiving waters caused by changes in flow, which in turn result in erosion or destabilization of natural drainages. In this case, it appears that the comment is requesting a summary of the analysis of cumulative impacts associated with physical alterations to natural drainages and Section 401 certification of those alterations, rather than cumulative impacts to natural drainages resulting from flow. Therefore, this response will focus on summarizing the conclusions of the Newhall Ranch Specific Plan Program EIR and the Landmark Village Draft EIR with respect to proposed physical alterations to natural drainages. Please see Draft EIR, Section 4.3, Water Quality, and WQTR, Sections 7.9.1 and 8.3, and prior EIR sections referenced therein, for a discussion of cumulative hydromodification impacts resulting from proposed changes in flow regime associated with development of the project in the context of the Newhall Ranch Specific Plan and other projects within the watershed.

The Newhall Ranch Specific Plan Conceptual Backbone Drainage Plan provide drainage and flood control protection to developed uses, while minimizing impacts to the Santa Clara River, Castaic Creek, Chiquita Canyon, and San Martinez Grande. The Conceptual Backbone Drainage Plan requires that all Newhall Ranch Specific Plan projects, including Landmark Village, be implemented in accordance with certain criteria to assure avoidance of natural resources within these channels. For example, the following criteria guide preparation of drainage improvement plans for all Newhall Ranch Specific Plan projects:

1. Flood corridor must allow for the passage of Los Angeles County Capital Flood discharge without the permanent removal of natural River vegetation (except at bridge crossings);
2. Bank stabilization for the River will generally be established outside of the "waters of the United States" as defined by federal laws and regulations and as determined by the delineation completed by the ACOE in August 1993;
3. Where the ACOE delineation width is insufficient to contain the Capital Flood flow, the flood corridor will be widened by an amount sufficient to carry the Capital Flood flow without the necessity of permanently removing vegetation or significantly increasing velocity; and

4. Soil cement will occur only where necessary to protect against erosion adjacent to the proposed development. Where existing bluffs are determined to be stable and there is no adjacent proposed development, no bank protection will be built.

Proposed bank protection will consist primarily of buried soil cement to provide scour and freeboard flood control protection. Soil cement bank protection provides a stable riverbank protection material, in terms of both surface erosion and structural stability. Additionally, soil cement bank protection will be mostly buried. The exposed top portion of the soil cement will be aesthetically and vegetatively compatible with the natural earth and vegetated bank area.

For the Newhall Ranch Specific Plan, a total of 38,400 linear feet of bank protection along the Santa Clara River, including accessory storm drain outfalls, was analyzed in the certified Newhall Ranch Specific Plan Program EIR. In addition, the previously certified Program EIR analyzed impacts to the Santa Clara River in connection with the installation of the approved three bridges.

Of that total, the Landmark Village project would implement the following subset of those previously analyzed and approved physical alterations to the Santa Clara River:

- Approximately 18,800 linear feet (LF) of River and Creek bank stabilization (buried bank stabilization) would be constructed in conjunction with the Landmark Village project. This would include approximately 11,000 LF fronting the tract map site, 6,600 LF on the south bank downstream (west) of Long Canyon Road Bridge, and 1,200 LF downstream of the project on the north bank, east of the Newhall Ranch WRP along the utility corridor.

- Approximately 6,600 LF of turf reinforcement mats (TRMs) or similar is proposed along the utility corridor along the north bank of the River extending west from the Landmark Village tract map site. TRMs are designed to reinforce vegetation at the root and stem allowing vegetation to be used as erosion control in areas where lower, non-erosive velocities in the capital storm are present.

- The Long Canyon Road Bridge includes eleven reinforced concrete piers spaced approximately 100 feet apart combined with bridge abutments (riprap) and bank protection.

- Widening of the SR-126 Castaic Creek bridge, resulting in the addition of approximately 500 LF of reinforced concrete along the Creek bank to be incorporated into the existing bridge abutments.

- Eleven (11) storm drain outlets will be constructed downstream of treatment BMPs, with associated localized energy dissipaters, consisting of either rip-rap or other larger reinforced concrete standard impact-type dissipaters.

- Finally, most of the buried bank stabilization and TRMs would be located outside of the existing Santa Clara River corridor. For example, soil cement proposed on the north side of the River near the confluence with Castaic Creek would be constructed within agricultural land thereby increasing the riparian corridor after implementation of the project.

The potential cumulative affects of these physical alterations on both the stability, hydrology, and hydraulics of the Santa Clara River, as well as to the jurisdictional waters, habitat and the biological function and value of the Santa Clara River have been analyzed in the previously certified Newhall Ranch Specific Plan Program EIR, including the Revised Additional Analysis (Section 2.3.6), and the Landmark Village Draft EIR (Sections 4.4, Biota, and 4.5, Floodplain Modifications). The following summarizes that cumulative impacts analysis.

Furthermore, the Landmark Village Draft EIR (Sections 4.2, Hydrology, and 4.5, Floodplain Modifications) concluded that the changes in flows and reduction in floodplain area caused by bank protection would not create a significant increase in overall velocities or water surface elevation, because the volume of flow carried in these shallow, slow-moving areas along the margins of the Santa Clara River is small. Moreover, variations are localized and limited in scope, especially when viewed in the entirety of the Santa Clara River corridor within the Newhall Ranch Specific Plan site and downstream. Therefore, the overall mosaic of habitats in the river would be maintained because the key hydraulic characteristics would not be significantly different under the Newhall Ranch Specific Plan. Based on these results, the proposed bank protection and bridges associated with the Newhall Ranch Specific Plan would not cause significant adverse changes to the hydraulic characteristics of the Santa Clara River, and, therefore, would not alter or adversely affect the amount and pattern of aquatic, wetland, and riparian habitats in the river.

Please see also **Response 15**, to letter from the County of Ventura, Resource Management Agency, dated January 19, 2007.

Response 15

The 2003 CDFG list represents that most recent evaluation by the CDFG of the rarity of a plant community, and as recommended by CDFG, should supersede earlier lists of plant communities (and associated evaluations of the rarity of plant communities) adopted by the CDFG. Accordingly, California sagebrush scrub is not identified in the Landmark Village EIR as a sensitive plant community because it is not identified on the 2003 list as "high priority for inventory," and is not otherwise regulated by the County. However, the Landmark Village Draft EIR (p. 4.4-58) still concludes that impacts to California sagebrush scrub are significant because of the habitat value this plant community provides for common and special-status plant and wildlife species. (See also, revised **Section 4.4, Biota**, of this Final EIR [same conclusion].)

Elderberry Scrub is no longer a mapped vegetation community within the Landmark Village project site. Elderberry is present as a component of other riparian vegetation communities and is included in the

Landmark Village Conceptual Wetlands Mitigation Plan plant palette. This plan is found in **Appendix A** of this Final EIR.

Response 16

Please see **Response 6**, above.

Response 17

The comment addresses the riparian buffer/setback associated with the proposed project. The comment expresses the view that the buffer setback should be "expanded to a minimum of 500 feet . . . "

Habitat buffers along the Santa Clara River were analyzed in the Landmark Village Draft EIR, Section 4.4.9, pp. 4.4-60 through 4.4-61. See also, the revised **Section 4.4, Biota**, found in this Final EIR. This section cites the Impact Sciences (1997) study that conducted vegetation analyses, focused bird surveys (1,100 field hours), and small mammal trapping (1,200 trap nights) along the Santa Clara River and adjacent uplands.[24]

The Buffer Study collected data for plant species composition, canopy height, shrub/tree density, percent cover and other species-specific criteria in order to define high-quality versus low-quality upland habitat for wildlife use and diversity. The focused wildlife studies concentrated on riparian bird and small mammal use of high- and low-quality upland habitat and upland/riparian ecotone and utilized systematic survey methods, including time-area observations, belt-transect counts at different distances parallel to the Santa Clara River, small mammal trapping, scent stations, and remote cameras. The Buffer Study thus helped identify the special-status populations at risk and their habitat use patterns along the River corridor. For example, at the western study site about 63 percent of riparian-dependent birds were observed in riparian habitat, 14 percent were in edge habitat, 18 percent were in upland habitat (primarily dense big sagebrush scrub and coastal sage scrub at this site) within 50 feet of the riparian edge, 5 percent were in upland habitat between 50 and 100 feet of the riparian edge, and 1 percent (one observation) were in upland habitat between 100 and 150 feet from the riparian edge. No riparian-dependent birds were observed beyond 150 feet from the riparian edge. Combined 94 percent of the riparian-dependent bird observations were within 50 feet of the riparian edge (including the riparian habitat) and 99 percent were within 100 feet. The Buffer Study also cited studies of least Bell's vireo in San Diego and Santa Barbara counties with findings that where the riparian corridor is relatively wide (>100 feet) vireos only foraged within 100 feet of the riparian edge and where the riparian corridor is more narrow (<100 feet) vireos

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24 Please see **Appendix A** of this Final EIR for the "North Valencia Annexation Buffer Study, Draft," Impact Sciences, Inc., dated April 28, 1997 (Buffer Study).

ranged up to 300 feet from the riparian edge. The Buffer Study suggests that riparian buffers along the Santa Clara River should range from a minimum of 100 to 150 feet in width, depending on the quality of the upland habitat (a larger buffer width required if the upland habitat is of low quality). Thus, habitat enhancement in areas where the buffer is narrower could compensate for the smaller buffer. In addition, the Buffer Study recommended a wall at the edge of development to attenuate noise and lighting, and to discourage human intrusion.

It also should be noted that a minimum 100 feet of high-quality upland habitat from the edge of riparian habitat is consistent with CDFG (Northern California-North Coast [Region 1]) buffer criteria for avoiding significant impacts to riparian species and habitats adjacent to urban development (CDFG 2001).[25] In developing the buffer criteria, CDFG stated that "[d]epartment biologists have relied on scientific research and literature and professional experience to develop the following recommendations to protect the public's fish, wildlife and native plant resources." For example, CDFG recommends a 75-foot buffer from the outside edge of the riparian habitat for the Sacramento River, a 50-foot buffer for main tributaries, and a 25-foot buffer for secondary tributaries. CDFG also stated that "[i]f development restrictions related to mandatory requirements do not allow a project to completely avoid the area of the buffer zone outside the riparian vegetation, the project proponent may average the setback distance along the riparian habitat for the length of the project." Therefore, there is some flexibility in the minimum buffer width as long as the average width criteria are met.

Before addressing buffer issues for the Landmark Village project, it is important to understand that the buffer between the Santa Clara River and development was addressed and heavily debated during the Newhall Ranch Specific Plan environmental review and approval process. Prior to final Specific Plan approval, the County Board of Supervisors required that the Specific Plan design be revised to incorporate a 100-foot-wide setback (top of bank stabilization to residential, commercial, mixed use development) to protect riparian habitat and special-status species within the River Corridor SMA/SEA 23 boundaries. This setback is in addition to an average buffer width on Landmark Village of 100 feet from the top of bank stabilization to existing riparian resources. This finding was arrived at after evaluating the potential impacts of the proposed land uses along the entire length of the River (consistent with the Kelly and Rotenberry recommendations), coupled with the existing habitat protection and enhancement provisions contained in the Specific Plan's Resource Management Plan and Design Guidelines. The overall buffer area is comprised of several components: (1) the Salt Creek wildlife corridor connection and the High Country half-mile-wide buffer at the westerly end of the Specific Plan on the south side of the River; (2) native upland habitats in the Open Area along the south side of the

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25 Please see **Appendix A** of this Final EIR for the CDFG (Northern California-North Coast, Region 1) buffer criteria.

River; (3) disturbed areas in the River corridor that will be restored or enhanced as riparian habitat; (4) buried bank stabilization that will be revegetated with native riparian and upland plant species; and (5) landscaped open space areas such as community parks, the Regional River Trail, and community trails.

In approving the Specific Plan and Conditional Use Permit No. 94-087-(5), the Board of Supervisors found that the Specific Plan contained sufficient natural vegetative cover and open space to buffer critical resources in the River Corridor SMA/SEA 23 (Special Management Area/Significant Ecological Area) from the development shown in the Specific Plan. The Board of Supervisors further found that the Specific Plan incorporated extensive buffer area to protect critical resources within the Santa Clara River. The Specific Plan's adopted Resource Management Plan requires a minimum 100-foot-wide setback adjacent to the Santa Clara River between the top river-side of the bank stabilization and development within certain specified land use designations (including those of the Landmark Village project site) unless through Planning Director review, in consultation with the County staff biologist, it is determined that a lesser buffer would adequately protect the riparian resources within the River Corridor SMA/SEA 23, or that a 100-foot-wide setback is infeasible for physical infrastructure planning. Again, these buffer criteria are consistent with the Impact Sciences and CDFG recommendations described above.

This buffer analysis does not presume that indirect effects on sensitive biological resources in the river corridor will not potentially occur as a result of development. In combination with the 100-foot setback, the Specific Plan's Resource Management Plan provides standards by which biological resources will be managed during construction and for the life of the community, including provisions for: (1) restoration and enhancement of disturbed areas; (2) restrictions on pedestrian and vehicular access to the river corridor; (3) design standards for transition areas between development and the river; (4) conveyance of conservation easements; and (5) preparation of a financial plan and the long-term management of the riparian resources by the Center for Natural Lands Management.

The Landmark Village project would maintain a 100-foot setback between the top of the bank and proposed residential, mixed-used, and commercial development and an average 100-foot-wide buffer from the top of bank stabilization to the existing riparian corridor. Based on the site-specific analysis conducted in the Draft EIR, the Landmark Village buffer is consistent with the approved Specific Plan. However, as noted above, designation of the buffer and setback does not imply that there is no potential for indirect effects. Specific to the Landmark Village project, potential long-term indirect effects are analyzed in Section 4.4 of the Draft EIR, pp. 4.4-85 through 4.4-92, including increases in: (1) pesticides, herbicides, and pollutants; (2) lighting and glare impacts on wildlife species; (3) non-native plant and wildlife species; and (4) human activity and domestic pets. The Project Design Features (PDFs) and mitigation measures to reduce these potential indirect impacts are also discussed in the Draft EIR.

PDFs to address urban runoff from irrigation and stormwater include site design, source control, treatment control, and hydromodification control Best Management Practices (BMPs). Stormwater runoff from all urban areas within the Landmark Village project will be routed to bioretention areas, vegetated swales, and/or extended detention basin treatment controls BMPs. The effectiveness of these PDFs to maintain water quality in the Santa Clara River was analyzed by GeoSyntec Consultants.[26]

The mitigation measures to address the other listed potential indirect effects include previously incorporated measures from the Newhall Ranch Specific Plan Program EIR and additional measures recommended by EIR. Significant impacts related to buffers and edge effects and mitigation measures to reduce the level of impact include:

- Restriction of Wildlife Habitat Linkages – mitigated by previously incorporated mitigation Measure SP 4.6-18.
- Increased Light and Glare – mitigated by previously incorporated Mitigation Measure SP 4.6-56.
- Increase in Populations of Non-native Plant and Wildlife Species – mitigated by the Landmark Village EIR Mitigation Measures LV 4.4-28 and LV 4.4-31.
- Increased Human and Domestic Animal Presence Within SMA/SEA 23 – mitigated by previously incorporated Mitigation Measures SP 4.6-17 through SP 4.6-19 and Landmark EIR Mitigation Measures LV 4.4-32 through LV 4.4-34.

Response 18

In the planning phases of the Newhall Ranch Specific Plan, large contiguous areas of native habitats (including California sagebrush scrub) were designated for protection and areas suitable for development were identified (based in part on minimizing impacts to sensitive biological resources). While efforts to minimize impacts to native plant communities have been made, complete avoidance of native habitats is not possible given the project requirements. As discussed in the Landmark Village Draft EIR (p. 4.4-58), given the acreage of California sagebrush scrub (267.27 acres) that would be developed as part of the Landmark Village project, and because of the habitat value this plant community provides for common and special-status plant and wildlife species, the loss of California sagebrush scrub would be a significant impact. Impacts to this plant community would be reduced by implementation of Specific Plan Mitigation Measures SP 4.6-37 through SP 4.6-42 (which would protect 1,311 acres of California sagebrush scrub in the High Country SMA/SEA 20) and the protection of the Salt Creek area (which contains 629 acres of this habitat type). Despite the preservation of 1,940 acres of California sagebrush scrub, a net loss of the plant community would still occur and related impacts would remain significant.

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26 GeoSyntec Consultants. September 2006. *Landmark Village Water Quality Technical Report* (see Draft EIR, Appendix 4.3).

As such, the off-site preservation of California sagebrush scrub (in addition to the 1,940 acres protected on the Specific Plan site) also would not compensate for the loss of the plant community on the Landmark Village project site.

Response 19

Mitigation Measure LV 4.4-2 in the Final EIR, revised **Section 4.4, Biota**, addresses the undescribed species of everlasting. As noted in the Final EIR, revised **Section 4.4, Biota**, pp. 4.4-78 through 4.4-79, this undescribed species of everlasting found on the project site is associated with alluvial terraces and benches along the Santa Clara River. These terraces and benches are constantly in a state of flux due to fluvial scour and accretion processes associated with the river corridor. Because the project will result in a net increase in jurisdictional area along the Santa Clara River, the proposed project would actually increase the area of potential habitat for this species. As this species' distribution may vary from year-to-year depending on storm events, pre-construction surveys and salvage and transplantation will ensure the potential for persistence of this species along the river corridor. As stated in Mitigation Measure LV 4.4-2, should the species be documented within the project boundary, avoidance measures shall be implemented where feasible to minimize impacts to individual plants.

Response 20

Figure 4.4-5 in revised **Section 4.4, Biota**, of the Final EIR has been revised to depict the location of the slender mariposa lily plants within the project site.

Response 21

The *Newhall Ranch Mitigation Feasibility Study* (Dudek 2007) identifies six different locations (total of 559 acres) as suitable areas for slender mariposa lily mitigation. This document is found in **Appendix A** of this Final EIR. In addition, the Slender Mariposa Lily plan (Dudek May 2007) is found in **Appendix A** of this Final EIR. This plan provides a description of the overall transplantation program, the donor and receptor sites, an implementation plan, a maintenance program, a long-term monitoring program, and a description of the success criteria.

Mitigation Measure LV 4.4-3 in the Final EIR (Mitigation Measure LV 4.4-19 in the Draft EIR) has been updated to include this report.

Response 22

As discussed on p. 4.4-55 of the Draft EIR, direct impacts on individuals or populations of plant and animal species "takes into consideration the number of individual plants or animals potentially affected,

how common or uncommon the species is both on the project site and from a regional perspective, and the species' sensitivity status according to resource agencies." The discussion and conclusion of impacts on the Pierson's morning glory on p. 4.4-66 of the Draft EIR considered all these elements and lists a number of reasons why impacts on this species on the Landmark Village site would not constitute a significant impact under CEQA. The Draft EIR also states (on the same page) that these findings are consistent with those of the Newhall Ranch Specific Plan Program EIR from which the Landmark Village Draft EIR is tiering.

The significance threshold criteria on biological resources, identified in the Draft EIR on p. 4.4-53, were derived from the *CEQA Guidelines*, particularly Appendix G. The authors of the Draft EIR are not aware of any documentation of the rarity of this species on a local or regional basis or as identified in any "local or regional plans, policies, or regulations, or by the CDFG or USFWS" as stated in the significance threshold criteria. As stated in the Draft EIR, Peirson's morning-glory occurs throughout the Newhall Ranch Specific Plan area on virtually all ridges and slopes within annual grassland, California sagebrush, and chaparral vegetation, habitats that are quite common within the project site and the Newhall Ranch Specific Plan area. Consequently, while the proposed project will impact sagebrush, grassland, and chaparral habitat for this species, the loss of this plant species within the confines of the Landmark Village property boundary was not considered to reach the "substantial" threshold identified by the significance threshold criteria in the Draft EIR and as adopted from Appendix G of the *CEQA Guidelines*. In addition, Mitigation Measure SP 4.6-53 on pp. 4.4-109 through 4.4-110 of the Draft EIR includes provisions to identify measures to avoid, minimize, or reduce potential impacts on special-status plants, including through habitat restoration, replacement, or enhancement. Peirson's morning glory populations also have been observed throughout both the High Country SMA/SEA 23 and the Salt Creek area and will be preserved in perpetuity in these areas.

Response 23

See **Response 19**, above.

Response 24

The requested change has been made to reflect the Center of Biological Diversity's comments. Please refer to the Final EIR **Section 3.0, Revised Draft EIR Pages**, for the requested revision. Specifically, Mitigation Measure LV 4.4-4 in the Final EIR (LV 4.4-21 in the Draft EIR) has been revised to require that the replacement of oak trees be in-kind.

The preservation of oak woodland habitat, as well as the implementation of Mitigation Measure LV 4.4-4 in the Final EIR (LV 4.4-21 in the Draft EIR) would comply with the requirements of the Specific Plan, the

County Oak Tree Ordinance, and Public Resources Code section 21083.4. In the preliminary planning phases of the Specific Plan, large contiguous areas of wildlife habitat (including oak woodlands) were designated for protection and to facilitate mitigation at the project-level. Specifically, the preservation of the River Corridor SMA/SEA 23 and the High Country SMA/SEA 20 would protect approximately 585 acres of oak woodland and 300 acres of oak savannah in perpetuity. The preservation of the Salt Creek area would protect approximately 266 acres of oak woodland and 113 acres of oak savannah in perpetuity. In total, over 851 acres of oak woodland and 413 acres of oak savannah (including the River Corridor SMA/SEA 23, the High Country SMA/SEA 20, and the Salt Creek area) would be preserved. This preservation meets the requirements of Public Resources Code section 21083.4 (Oak Woodlands Conservation). Additionally, Mitigation Measure LV 4.4-4 in the Final EIR (LV 4.4-21 in the Draft EIR) requires conformance (including the replacement of oak trees) with the County of Los Angeles Oak Tree Ordinance.

Response 25

The requested change has been made to reflect the Center of Biological Diversity's comments. Please refer to the Final EIR **Section 3.0, Revised Draft EIR Pages**, for the requested revision. Specifically, Section 4.4, Biota, has been revised to require that, to the degree feasible, all work within the Santa Clara River (including construction of the Long Canyon Road Bridge) shall occur when unarmored threespine stickleback is not present (see Mitigation Measures LV 4.4-7 and LV 4.4-17 in the Final EIR). Should construction activities within the river channel be necessary while water is present in the disturbance zone, then construction would only be conducted as follows: (1) when water flows are insufficient to support unarmored threespine stickleback or to allow passage of the species through the disturbance area (as determined by the qualified fisheries biologist, subject to the approval of the County and CDFG); (2) it has been determined by the qualified biologist that threespine stickleback is not present within areas to be affected; or (3) if it is determined that stream diversions are necessary to complete the required work, then to avoid take of unarmored threespine stickleback the diversions of water shall be conducted in a manner that would not result in the take or possession of unarmored threespine stickleback. These measures also would serve to further reduce the potential of the project to adversely affect other special-status aquatic species.

Response 26

The comment is noted. All native bird species in California are "protected" by the Migratory Bird Treaty Act and by regulations promulgated in the California Fish and Game Code. Mitigation Measure LV 4.4-24 in the Final EIR, revised **Section 4.4, Biota**, is intended not only to minimize/avoid impacts on special-status bird species, but on all bird species otherwise protected by the Migratory Bird Treaty Act and the

California Fish and Game Code such that no violations (i.e., take or disturbance of active nests or individual birds) of these regulations would occur.

Response 27

The Landmark Village Conceptual Wetlands Mitigation Plan (Dudek 2007) is found in **Appendix A** of this Final EIR. This plan provides a description of the overall wetlands mitigation program, the proposed permanent and temporary impacts, an implementation plan, a maintenance program, a long-term monitoring program, and a description of the success criteria.

Mitigation Measure LV 4.4-1 also has been updated to include this report:

LV 4.4-1 The Landmark Village Conceptual Wetland Mitigation Plan (see **Appendix A** of the Final EIR) shall be implemented by the applicant (see also Mitigation Measure 4.6-63). The plan specifies, at a minimum, the following: (1) the location of mitigation sites; (2) the quantity and species of plants to be planted; (3) procedures for creating additional habitat; (4) methods for the removal of non-native plants; (5) a schedule and action plan to maintain and monitor the enhancement/restoration area; (6) a list of criteria and performance standards by which to measure success of the mitigation sites; (7) measures to exclude unauthorized entry into the riparian creation/enhancement areas; and (8) contingency measures in the event that mitigation efforts are not successful. The plan provides for the 1:1 replacement of any Southern California black walnut to be removed from the riparian corridor. The plan provides for the mitigation of big sagebrush scrub along the riparian corridor. The plan shall be subject to the approval of CDFG, ACOE, and the County, and approved prior to issuance of the grading permit.

The Landmark Village project site vegetation mapping was updated in the summer 2006. The Final EIR, revised **Section 4.4, Biota**, has been revised to clarify impacts to the following resources (a summary of which is provided here): The project will result in direct, permanent impacts to 0.04 acre of southern willow scrub, 8.05 acres of southern cottonwood-willow riparian forest, 0.47 acre of alluvial scrub, 5.49 acres of arrow weed scrub, 7.12 acres of mulefat scrub, 9.13 acres of big sagebrush scrub, and 6.26 acres of river wash. There will be temporary impacts to 3.64 acres of southern willow scrub, 12.95 acres of southern cottonwood-willow riparian forest, and 0.63 acre of arrow weed scrub, 2.13 acres of mulefat scrub, 2.46 acres of big sagebrush scrub, and 3.70 acres of river wash.

The comment states that alluvial scrub was inaccurately described as a common plant community in the Draft EIR. Riversidian Alluvial Fan Sage Scrub is the only alluvial scrub called out as sensitive under *The Vegetation Classification and Mapping Program: List of California Terrestrial Communities Recognized by The California Natural Diversity Database* (CDFG 2003). Species found on site within the alluvial scrub community include big sagebrush (*Artemisia tridentata*), mule, tree tobacco, scalebroom (*Lepidospartum*

squamatum), big saltbush (*Atriplex lentiformis*), and California sagebrush, but no Riversidian Alluvial Fan Sage Scrub occurs on site. Alluvial scrub is thus described correctly as a common plant community.

Response 28

The comment states that the Draft EIR does not adequately account for indirect effects associated with "increased off-road vehicle (ORV) use of the Santa Clara Riverbed and other sensitive areas that the project will facilitate." The comment also states that "ORV trespass associated with increased access and adjacent residential development has been well documented in other portions of the Santa Clara River subject to the Natural River Management Plan." The comment further requests analysis of other suggested mitigation measures, such as vehicular barriers, limited access points, and active patrols.

Although agencies make every effort possible to enforce off-road vehicular use, short of walling the river in, which would preclude all visual access, and imposing fencing or other barriers to preclude vehicular entry, enforcement is conducted on an as-needed basis. In addition, budgetary constraints do not allow for active patrols of the river. Further, the comment does not provide any supporting documentation of an increase in trespassing associated with adjacent residential development within the Specific Plan site or upstream as part of the Natural River Management Plan. Therefore, after having considered the mitigation options presented in this comment, the County has rejected them as neither reasonable from a visual/aesthetic standpoint, nor feasible or desirable due to budgetary constraints and because such measures are not needed in light of access controls already in place under the proposed project and the adopted Specific Plan, described below.

No direct access from the Landmark Village project is proposed or will be allowed. In addition, the adopted Specific Plan (Section 2.6, Resource Management Plan) already contains recreation and access management requirements for both the River Corridor SMA/SEA 23 and the High Country SMA/SEA 20. For example, the adopted management requirements for the River Corridor SMA/SEA 23 only allow access to the River Corridor SMA/SEA 23 for hiking, equestrian, and biking on the river trail system. Also, no motor or off-trail bike riding is permitted in the area (see, Specific Plan, May 2003, pp. 2-99–2-100). In addition, roads and bridges that cross the River Corridor SMA/SEA 23 are required to have adequate barriers at their perimeters to discourage access to the River Corridor SMA/SEA 23 adjacent to such structures (see, Specific Plan, May 2003, p. 2-105).

Response 29

See **Response 17**, above. Additionally, to further reduce indirect effects associated with increased human and domestic animal presence, the following additional mitigation measures have been incorporated into the Final EIR:

LV 4.4-32 The Home Owners Association shall fund or otherwise coordinate the regular removal of trash and debris from riparian habitats on or adjacent to the project site. The removal of trash shall be conducted in a manner as to not disturb sensitive habitats.

LV 4.4-33 The Home Owners Association shall supply educational information to future residents regarding not allowing cats outdoors or other pets outdoors while unattended. The material shall discuss the presence of native animals (e.g., coyote, bobcat, mountain lion) that could prey on pets and indicate that no actions shall be taken against native animals should they prey on pets allowed outdoors.

LV 4.4-34 Dogs shall be required to be leashed while using the designated trail system and shall be prohibited from within protected riparian and upland habitats bordering the tract map site.

Response 30

The comment states that the main volume of the Draft EIR does not contain a comprehensive analysis of the project's consistency with applicable General Plan and Specific Plan policies, or SEA compatibility criteria. The comment correctly points out that the Landmark Village project approvals include a General Plan Amendment (GPA) and a Specific Plan Amendment (SPA), and that the Draft EIR must "reevaluate" the Specific Plan's consistency with the "General Plan or the project's compatibility with the SEA policies of the General Plan." Finally, the comment points out that Appendix 2.0 in the Draft EIR, which was circulated for public review, includes a comprehensive Specific Plan Consistency Analysis, which includes a Land Use Plan statistical analysis, Specific Plan policy analysis, River Corridor SMA/SEA 23 analysis, and High Country SMA/SEA 20 analysis.

There also is no need or requirement for the County to "reevaluate" the project's consistency with SEA compatibility criteria, because the County is considering the requested GPA and SPA. First, the requested GPA and SPA are limited in nature. Both seek to amend the County's Master Plan of Highways, Santa Clarita Valley Areawide Plan Circulation Plan, and the Specific Plan Master Circulation Plan to downgrade "A" Street within Landmark Village from a Secondary Highway to a Collector Street for the reasons outlined in the Draft EIR, Section 1.0, p. 1.0-16. Neither the GPA nor the SPA has any relationship to the County's General Plan SEA policies or criteria. As a result, the County is not required by law to "reevaluate" the project's consistency with those General Plan SEA policies/criteria.

In addition, the Newhall Ranch Specific Plan Program EIR exhaustively addressed the Specific Plan's consistency with the County's General Plan SEA policies and criteria. This consistency analysis included the Landmark Village project site. (See, for example, Newhall Ranch Revised Additional Analysis, Vol. VIII (May 2003), Section 2.4, SEA General Plan Consistency.) The proposed Landmark Village project remains consistent with this prior SEA consistency analysis. This analysis also was the subject of litigation in the Newhall Ranch case in Kern County. The author of the comment was counsel for one or more project opponents in that litigation, and is aware of the favorable outcome in respect of the Specific Plan's consistency with SEA policies and criteria. Nothing about the traffic-related GPA or SPA changes or alters the prior Specific Plan's consistency analysis with SEA policies and criteria. And, the Landmark Village project site remains consistent with that prior SEA consistency analysis, and the traffic-related GPA/SPA requests have no relationship to the General Plan SEA policies/criteria, and do not render the Landmark Village project "inconsistent" with those policies and criteria.

Response 31

The Landmark Village project is a component of the greater Newhall Ranch Specific Plan. The Specific Plan guides the long-term development of the 11,963-acre Newhall Ranch community and includes the preservation of large areas of open space. In the preliminary planning phases, large contiguous areas of wildlife habitat (including oak woodlands) were designated for protection and to facilitate mitigation at the project level. Consistent with Specific Plan Resource Conservation Objective No. 4, the preservation of the River Corridor SMA/SEA 23 and the High Country SMA/SEA 20 would protect approximately 585 acres of oak woodland and 300 acres of oak savannah in perpetuity. The preservation of the Salt Creek area would protect approximately 266 acres of oak woodland and 113 acres of oak savannah in perpetuity. In total, over 851 acres of oak woodland and 413 acres of oak savannah (including the River Corridor SMA/SEA 23, the High Country SMA/SEA 20, and the Salt Creek area) would be preserved.

Response 32

Please see **Response 30**, above, with regard to the project's consistency analysis. The County **e**lected to include the Specific Plan Consistency Analysis as an appendix to the Draft EIR (see Appendix 2.0). This election is consistent with the *CEQA Guidelines*. The project's consistency analysis also was circulated for public review as part of the Landmark Village Draft EIR. There is no legal requirement that the analysis be included in the main volume of the Draft EIR, particularly where, as here, it was circulated as part of the Draft EIR and readily available for public review.

Response 33

The comment infers that the range of EIR alternatives is too narrow. As discussed in Landmark Village Draft EIR, Section 5.0, Alternatives, p. 5.0-1, with regard to range of alternatives:

> "…the principal purpose of the alternatives analysis is to assess a range of project alternatives that would reduce the magnitude of, or eliminate, potential project-related impacts. However, the *CEQA Guidelines* place some restrictions on the range of alternatives an EIR must address. First, an EIR need only examine those alternatives that meet most basic objectives of the project. Second, the *CEQA Guidelines* stipulate that alternatives addressed in an EIR should be feasible and should not be considered remote or speculative. When addressing feasibility, the *CEQA Guidelines* state that "…among the factors that may be taken into account when addressing the feasibility of alternatives are site suitability, economic viability, availability of infrastructure, general plan consistency, jurisdictional boundaries, and whether the applicant can reasonably acquire, control or otherwise have access to the alternative site." Third, where a previous EIR analyzed a range of reasonable alternative locations and environmental impacts for a project with the same basic purpose, the EIR may rely on the previous document to assess the feasibility of potential project alternatives to the extent the circumstances remain substantially the same as they relate to such alternatives.
>
> Based on these CEQA-driven directives, alternatives to the project that would reduce significant adverse impacts without undermining basic project objectives were selected for analysis in this section."

The comment suggesting that "straw men" are used for the purpose of proposing alternatives that could never be adopted based on the defined project objectives is one of opinion. Nonetheless, the comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not address or question the content of the Draft EIR, no further response is required.

Response 34

The comment contends that project objectives are too narrowly drawn. *CEQA Guidelines* §15126(a) states: "An EIR shall describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen the significant effects of the project and evaluate the comparative merits of the project." The County's review of the project objectives in response to this comment confirms that all of the project objectives are appropriate for consideration, and consistent with CEQA requirements.

Response 35

The comment questions the number of project alternatives studied in the Landmark Village Draft EIR and asserts that project objectives were narrowly applied and highly biased in favor of the project. The County has re-reviewed the project alternatives in response to this comment. There is no "bias" in favor of the project; however, it is acknowledged that the existing "baseline" includes the approved Specific Plan, and that Landmark Village is obviously intended to implement a portion of the previously approved Specific Plan. Project alternatives were developed, and project objectives prepared, to help the County develop a range of reasonable alternatives. The alternatives also were prepared with a view toward feasibly obtaining most of the basic objectives of the Landmark Village project, but at the same time, avoiding or substantially lessening any of the significant effects associated with the project.

Response 36

The comment states that the justification for rejecting Alternative 3 has no basis. The *CEQA Guidelines* are clear with regard to the comparison of alternatives to the project objectives. Please see **Response 34**, above. Alternative 3 reduces some significant impacts and, therefore, is an appropriate alternative under CEQA. The County also believes it is appropriate to propose rejection of Alternative 3 on the grounds that it would significantly reduce housing and commercial uses; and, therefore, reduce the project's capability of accommodating projected regional growth (see, Land Use Planning Objective No. 2). This is particularly the case where, as here, the Landmark Village project is adjacent to existing and planned infrastructure, urban services, transportation corridors, and major employment centers. In short, the Specific Plan, including Landmark Village, has been determined to be an appropriate location in which to accommodate projected regional growth in the Santa Clarita Valley. The County's desire to accommodate regional projected growth in this location is a reasonable consideration in rejecting alternatives under CEQA. See, for example, *City of Del Mar v. City of San Diego* (1982) 133 Cal.App.3d 401. The documentation of projected regional growth by population, housing, and employment is provided by SCAG in its Regional Comprehensive Plan and Guide, which is available for public inspection and review through SCAG's website, www.scag.ca.gov, and is incorporated by reference.

Response 37

As stated in the Landmark Village Draft EIR, Section 5.0, Project Alternatives, p. 5.0-6, Alternative 3 would allow "approximately 79 acres of land [to] remain available for agricultural development due to the reduction in residential and commercial development." Furthermore, Figure 5.0-1 illustrates that only 79 acres would be available for agricultural uses. Section 5.0, Project Alternatives, p. 5.0-16 states: "From a practical standpoint it would be difficult to cost effectively manage and farm small,

discontinuous agricultural areas within the project boundary." There would be a fragmentation because the Landmark Village site is not adjacent to other agricultural lands. With regard to the comment that there is no discussion as to how development and transitional land use patterns under Alternative 3 would be more conflicting when compared to the proposed project, the Draft EIR, Section 5.0, Project Alternatives, p. 5.0-16, specifically responds to this comment with the following: "In addition, Alternative 3 would place residential uses directly adjacent to areas under agricultural cultivation, which could introduce incompatible land use and result in increased costs to farmers as they try to address residential complaints associated with the exposure to dust, odors, and similar intrusive conditions." The proposed project would remove the conflict of development uses with active agricultural cultivation.

Response 38

Please see **Response 34**, above. The reduction of housing units would reduce significant impacts when compared to the proposed project. The fact that Alternative 3 did not discuss a range of housing densities, styles, or types is incorrect. A main objective of the alternative selection is to choose alternatives that would reduce significant impacts. A conclusion was made that Alternative 3 would not meet the project objectives of providing a wide range of housing densities, types, and styles of housing. Figure 5.0-1, FEMA Floodplain Avoidance Alternatives, specifically shows that this alternative would reduce the variety of densities associated with condominiums. Additionally, this figure shows that this alternative also would eliminate all apartment/housing in the Landmark Village project site.

Response 39

The comment states that the Draft EIR assumes that the preferred project will promote a pedestrian friendly environment because residents will both live and work on the site. This is not correct. We do not find where in the Draft EIR it makes this assumption. The comment also states an assumption that project residents will commute to work off site, while non-residents will commute to work on site. The Draft EIR, Project Alternatives, Section 5.0, makes no such assumptions. The conclusions for both Land Use Planning Objective No. 7 and Mobility Objective No. 1 are that commercial uses are a part of a balanced community and land use plan that promotes livability and pedestrian access between land uses. No further response required.

Response 40

CEQA Guidelines Section 15126.6 provides that the purpose of the alternatives section of an EIR is to assess a range of reasonable alternatives to the proposed project, or to the location of the project, which would feasibly attain most of the basic objectives of the project, but would avoid or substantially lessen any of the significant effects of the project. The EIR also must include sufficient information about each

alternative to allow meaningful evaluation, analysis, and comparison with the proposed project. The discussion of alternatives should be governed by the "rule of reason." In further response, the comment requests that the County evaluate a "variant of Alternative 3 that does not involve a substantial reduction in trails and paseos on the project site." There is no requirement under CEQA to evaluate variations on alternatives when the relative advantages and disadvantages of the alternatives can be assessed from a review of the alternatives presented in the EIR.

Response 41

The comment concludes that the project's electrical usage and cumulative impacts at project build-out are "understated." The project evaluates the electrical usage generated by various uses proposed for the project site. This is consistent with the *CEQA Guidelines* §15126.2(a): "In assessing the impact of the proposed project on the environment, the Lead Agency should normally limit its examination to changes in the existing physical conditions in the affected area as they exist at the time the notice of preparation is published" The Landmark Village Draft EIR estimates electrical usage quantities on p. 4.19-8. Cumulative impacts associated with electrical power are discussed in the Draft EIR, Section 4.19-11, p. 4.19-11, as follows:

> "In this case, cumulative impacts on energy supply and infrastructure associated with development of the entire Newhall Ranch Specific Plan were fully evaluated in Sections 4.13, Natural Gas and 4.14, Electricity of the Newhall Ranch Specific Plan Program EIR. Consequently, this EIR incorporates by reference the natural gas and electricity analysis and conclusions from that certified EIR. That analysis concluded that the cumulative development scenario (referred to as the "Santa Clarita Valley Cumulative Buildout Scenario") would not have a significant impact on electricity or natural gas. Therefore, the Landmark Village project, in conjunction with other related cumulative development in the Valley, would have less than significant impacts on electricity and natural gas resources."

Both project-level and cumulative impacts have been prepared subject to the requirements of the *CEQA Guidelines*. This EIR section is valid and there is no need for recirculation.

Response 42

The comment states that the most recent natural gas demand from all sectors will increase at an annual rate of 0.15 percent between 2006 and 2025. This statement is verified by the 2006 California Gas Report. This annual rate increase is for residential, commercial, and industrial sectors. The Landmark Village project proposes only residential and commercial usage. With regard to residential uses, the 2006 California Gas Report states that "[f]or the forecast period covering 2006 through 2025, residential meters are estimated to increase at an average annual rate of 1.3 percent. Forecasted population growth in

SoCalGas' service territory is expected to drive an increase in connected residential single family and multi-family customers." However, this report further states that while the number of meters may increase, the usage per meter is in decline. "Use per meter for all classes of residential customers is forecasted to decline due to the expected energy saving from tightened building and appliance standards and utility energy efficiency programs. In 2005, the single family and multi-family average annual use per meter were 532 therms and 330 therms, respectively. By 2025, the single and multi-family average use per meter is forecasted to decline to 505 and 300 therms, respectively. At the end of the forecast period, the average use per residential customer is expected to fall to 430 therms per year. The change reflects a 14.5 percent decline in the temperature adjusted annual usage per customer due to continued improvements in the efficiency of appliances, tighter building shells and the cumulative impact of energy efficiency programs administered by the utilities. The projected residential natural gas demand will be influenced primarily by residential meter growth and the forecasted declining use per customer."

With regard to commercial usage, the 2006 California Gas Report states that "core commercial market demand is forecast to decrease about 1.1 percent per year." Consequently, the section is not invalid and need not be recirculated. The Landmark Village Final EIR, Section 4.19, Utilities, will be modified to reflect the updated information provided above. Please refer to the Final EIR **Section 3.0, Revised Draft EIR Pages**, for the requested revisions.

Response 43

The comment questions the location of the gas lines and whether or not sensitive habitat would be disturbed. The gas lines to the project would be a part of the proposed utility corridor. The utility corridor is illustrated in all applicable figures within the document. A description of the utility corridor is found in the Landmark Village Draft EIR, Section 1.0, Project Description, p. 1.0-3: "225.5-acre utility corridor, which would run parallel to SR-126, from the western boundary of the tract map site to the approved Newhall Ranch WRP near the Los Angeles County/Ventura County line, from the eastern boundary of the tract map site to the Old Road/Interstate 5 (I-5), and then south to the existing Valencia WRP, which would extend municipal services to and from the tract map site."

The analysis of impacts to sensitive habitats considered the project's utility corridor. Please see Draft EIR, Section 4.4, p. 4.4-53, which describes the 224.5 utility corridor as a part of proposed project improvements.

Response 44

The comment states that the Draft EIR "proposes only a set of mitigation measures adopted in connection with the Specific Plan," and that the project "should include project-specific mitigation measures

consistent with *CEQA Guidelines* Appendix F." The Draft EIR contains not only the previously adopted Specific Plan mitigation measures, but also mitigation measures recommended by this Landmark Village project EIR. In terms of energy-related mitigation measures, please see **Topical Response 6**: Global Climate Change and Its Effects on California Water Supplies; and **Topical Response 8**: Greenhouse Gas Emissions and Global Climate Change, for responsive information regarding global warming. In addition, please see the applicant's sustainability summary, which is provided in **Appendix F** of this Final EIR. Finally, it should be noted that the CEQA Appendix F energy conservation measures are not required, but rather are suggested measures that should or may be included in an EIR. Some of the measures listed in Appendix F to the *CEQA Guidelines* already are incorporated in the previously certified Newhall Ranch Specific Plan; and, therefore, will be applied to the Landmark Village project.

Response 45

The comment states that the Landmark Village Draft EIR "fails to analyze and mitigate the project's greenhouse gas emissions." The comment also points out, correctly, that the Draft EIR, Section 4.9, Air Quality, at pp. 4.9-19 through 4.9-21, identified conditions and constituents "possibly affecting the regional climate conditions," including "global warming." The discussion regarding global warming was taken from Chapter 3 of the Air Quality Management District Guidelines. The discussion included the identification of global warming gases and ozone-depleting gases, including, but not limited to, carbon dioxide, chlorofluorocarbons, halons, hydro-chlorofluorocarbons, and methane.

In addition, the Landmark Village Draft EIR, Section 4.10, Water Service, discussed global warming and the potential impacts it could have on California's future water supplies. Specifically, at p. 4.10-46, the Draft EIR stated:

> "A topic of growing concern for water planners and managers is global warming and the potential impacts it could have on California's future water supplies. DWR's *California Water Plan Update 2005* contains the first-ever assessment of such potential impacts in a California Water Plan (see Appendix 4.10). Volume 1, Chapter 4 of the Water Plan, *Preparing for an Uncertain Future*, lists the potential impacts of global warming, based on more than a decade of scientific studies on the subject.
>
> Changes in Sierra snowpack patterns (the source of the SWP's water supply in Lake Oroville), hydrologic patterns, sea level, rainfall intensity, and statewide water demands are all possible should global warming prove to be increasing through time. Computer models (such as CALVIN) have been developed to show water planners what types of effect climate change could have on the water supply. DWR has committed to continue to update and refine these models based on on-going scientific data collection, and to incorporate this information into future California Water Plans, so that agencies like CLWA and the purveyors can plan accordingly.

> DWR also addresses global warming in its report, *SWP Delivery Reliability Report 2005, Final*, noting that until the impacts of climate change on precipitation and runoff are better quantified, future weather patterns are usually assumed to be similar to those of the past (see Appendix 4.10). DWR also acknowledges that this assumption has an inherent uncertainty, especially given the evolving information on the potential effects of global climate change and indicates that as information regarding climate change becomes better defined, it will be helpful in guiding the development of statewide strategies for the future management and development of water resources facilities, including the SWP."

Thus, contrary to the comment, the Draft EIR addressed global climate change or global warming. This analysis was conducted as of November 2006, when the Draft EIR was first circulated for public review and comment. At that time, EIRs generally did not address the subject of global climate change, or global warming, primarily because a CEQA-based analysis of global warming impacts was viewed as difficult, speculative, or both, due to a myriad of issues, including:

(a) The connection between human activity and global warming was not agreed upon, making it difficult to identify potential impacts that could or should be assessed;[27]

(b) The difficulty in determining whether and how a CEQA document should analyze vehicle emissions as an impact of new development, because while vehicle emissions are a source of greenhouse gas emissions, development does not necessarily cause vehicle emissions, but it may change emission patterns;

(c) There are no accepted CEQA thresholds of significance relative to global climate change; and, therefore, no consistent means exist for determining whether project or cumulative impacts will make "significant" contributions to greenhouse gas emissions;

(d) Global warming is generally viewed as a world-wide environmental condition; and

(e) Population growth is not a result of new development; rather new development accommodates population growth that will occur within a specific air basin – with or without a particular new development project.

Nonetheless, on September 27, 2006, Governor Arnold Schwarzenegger signed into law the Global Warming Solutions Act of 2006, better known by its Assembly Bill number, AB 32. Since the passage of AB 32, a number of lead agencies responsible for reviewing a wide-array of proposed development projects have received comment letters requesting CEQA analysis of global warming impacts. This particular comment letter falls into this category. In response to comments like this comment letter, additional analysis has been conducted concerning the subject of global climate change, or global warming. This additional analysis is found in this Final EIR in **Topical Response 6**: Global Climate

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[27] See, e.g., National Research Council, 2005, "Radiative Forcing of Climate Change," p. 125 ("the mechanisms involved in land-atmosphere interactions are not well understood, let alone represented in climate models").

Change And Its Effects On California Water Supplies; **Topical Response 7**: Global Climate Change And Its Effects On Sensitive Biological Resources; and **Topical Response 8**: Greenhouse Gas Emissions And Global Climate Change.

In addition, the County has considered the information presented in **Appendix A** to CBD's comment letter; specifically, **Appendix A** entitled, "Global Implications of Climate Change and Greenhouse Gas Emission."

Response 46

The comment refers to the CEQA requirement for an EIR to analysis "significant environmental effects" of a proposed project, and the definition of the term "significant effect on the environment." The comment also refers to the "criteria" that requires a finding that a project may have a "significant effect on the environment" if one or more conditions exist (i.e., project with the potential to degrade the quality of the environment, project that creates "cumulatively considerable" impacts, and project that causes "substantial adverse effects on human beings, either directly or indirectly"). The comment then asserts that greenhouse gas emissions trigger the criteria found in CEQA.

For information responsive to this comment, please refer to **Topical Response 8**: Greenhouse Gas Emissions And Global Climate Change.

Response 47

Please see **Response 46**, above.

Response 48

Please see **Response 46**, above.

Response 49

The comment discusses the impacts of global warming on California. This topic has been extensively addressed in the Final EIR in **Topical Response 6**: Global Climate Change and Its Effects on California Water Supplies; **Topical Response 7**: Global Climate Change and Its Effects on Sensitive Biological Resources; and **Topical Response 8**: Greenhouse Gas Emissions and Global Climate Change.

Response 50

The comment addresses the impacts of global warming on threatened, endangered, rare, and special-status species in California. This topical has been extensively addressed in the Final EIR in **Topical Response 7**: Global Climate Change and Its Effects on Sensitive Biological Resources.

Response 51

Please see **Response 50**, above.

Response 52

Please see **Response 50**, above.

Response 53

Please see **Response 50**, above.

Response 54

Please see **Response 50**, above.

Response 55

The comment states that the Landmark Village Draft EIR "overlooks" the project's greenhouse gas emissions. The comment is somewhat misleading, in that greenhouse gas emissions were not generally addressed in EIRs under CEQA until well after the passage of AB 32. The primary focus of air quality analysis in CEQA documents was the emission of criteria pollutants, or those identified in the state and federal Clean Air Acts as pollutants of concern.

AB 32 now requires that the California Air Resources Board (CARB) adopt regulations to require first reporting and evaluation of statewide greenhouse gas emissions, and then to create a program to limit statewide emissions to 1990 levels. This program is to be adopted by 2012, and implemented in a manner achieving emissions compliance by 2020. AB 32 did not amend CEQA to require EIRs to analyze a project's greenhouse gas emissions. Nonetheless, the passage of AB 32 has created the unintended effect of the new law being used as the basis for arguing that CEQA requires the identification and analysis of greenhouse gas emissions, and implementation of mitigation measures to address such impacts.

Despite this on-going debate, one thing is clear at this time: The topic of global warming and the potential impacts it could have on California and elsewhere is a growing concern, which is receiving

considerable attention at the federal, regional, state, and local levels. In light of that fact, the Final EIR now includes considerable detail concerning global climate change or global warming. Please see **Topical Response 6**: Global Climate Change and Its Effects on California Water Supplies; **Topical Response 7**: Global Climate Change and Its Effects on Sensitive Biological Resources; and **Topical Response 8**: Greenhouse Gas Emissions and Global Climate Change, for responsive information regarding global warming.

Response 56

Please see **Response 55**, above.

Response 57

Please see **Response 55**, above.

Response 58

Please see **Response 55**, above.

Response 59

The comment states that the Landmark Village project "could include mitigation" for its impacts on global climate change, or global warming. Please see **Response 55**, above. In addition, currently, the Landmark Village Draft EIR includes mitigation measures that contribute to the reduction of greenhouse gas emissions. Please see, for example, Draft EIR, Section 4.9, Air Quality, pp. 4.9-67 through 4.9-82, and Section 4.10, Water Service, pp. 4.10-84 through 4.10-91. And, please see the Landmark Village Final EIR, **Appendix F**, for the applicant's Sustainability summary.

Response 60

Please see **Response 59**, above.

Response 61

Please see **Response 59**, above. In addition, the County has reviewed and considered the website information referenced in this comment.

Response 62

Please see **Response 59**, above.

Response 63

The comment expresses the opinion that the Landmark Village Draft EIR should be recirculated. The environmental consultant, Impact Sciences, Inc., does not concur with the comment at this time. The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not address or question the content of the Draft EIR, no further response is required.

Response 64

The comment asks that John Buse, staff attorney, Center for Biological Diversity, be added to the mailing list for this project. In response, Mr. Buse's address has been added to the mailing list by the environmental consultant (Impact Sciences, Inc.) and the County's Department of Regional Planning.

Letter No. D22

Impact

February 11, 2007

Daniel Fierros
Los Angeles County Regional Planning Dept.
320 W. Temple St.
Los Angeles, CA 90012
Fax: (213) 217-5108

ENV-28
(1-20 Attachment)

Re: Landmark Village DEIR and all entitlements
Please copy to all commissioners

Dear Commissioners:

The California water Impact Network (C-WIN) wishes to thank the commissioners for extending the comment period on this very important project until February 20, 2007. 1

In addition to our earlier comment letter submitted on January 31, 2007, we would add that we have found a significant problem with several of the purported transfers that Landmark Village and the Newhall Land and Farming Company's Newhall Ranch Specific Plan Program EIR rely on. 2 As we understand it, over 21,000 housing units and all of the other development that goes with them, including but not limited to, schools, parks, recreation facilities, commercial/industrial facilities, etc. is being planned by the Newhall Land and Farming Co. and Landmark Village is the first phase of this master plan. 3 It is therefore very important to consider the cumulative impacts of the entire project; especially where water supply is concerned. 4

You must evaluate the Landmark Village development and the Newhall Land and Farming Company Specific Plan in light of the recent California Supreme Court's decision, Vineyard Area Citizens for Responsible Growth, Inc. et al. v. City of Rancho Cordova, Case No. S132972, in which the Court found that EIR's long term water planning to be inadequate. 5 The Vineyard decision makes clear that water purveyors and land use planners must objectively and in good faith disclose the uncertainty associated with potential sources of water, and identify and evaluate alternative sources in light of such uncertainly. The Vineyard decision also makes clear that the outcome of future environmental reviews that could affect the identified water supplies may not be assumed. The DEIR's cumulative impacts analysis significantly understates the potential impacts, failing to adequately analyze the present project's role as one part of one of the largest sprawl development projects in California's history. 6 The cumulative impacts analysis for water supply does not seem to ensure that all Newhall related development is being considered.

The DEIR seems to rely on overly optimistic assumptions about the long-term reliability of the water that can be delivered from the alluvial aquifer to show that State Water Project water is not required for this project (4.10-3). 7 This is not an adjudicated aquifer and therefore for the Newhall Ranch Co to "assume" that it "owns" the rights to this water is not valid. 8 There is no assurance that a given level of water will be available for permanent development. 9

Local environmental groups have argued for many years that all the local groundwater basins are at risk of serious shortfall, and the Santa Clara River is already experiencing significant problems as a result of existing development. The 2005 Urban Water Management Plan relied on extensively in the DEIR and the WSA, is presently being challenged in court partly because it overstates the availability and safety of local groundwater as well as water from the SWP. If these local environmentalists are correct, other supplies will be needed to support any new permanent development. 10

The DEIR summarily relies on speculation from the Valencia Water Co. that it will do a significant job in the future of containing and treating the perchlorate contamination in the alluvial aquifer and elsewhere (see 4.10-5 & 6). Apparently the authors of this DEIR have forgotten that CLWA's 2000 UWMP was invalidated due to its failure to address perhlorate problems. These problems have still not been addressed. Much more is needed on the perchlorate issue than to just summarily accept the water agencies assurances. 11

The DEIR discusses a 20,000 AF transfer from the Buena Vista/Rosedale Rio Bravo storage facility. The Landmark Village DEIR appears to mislead the reader into believing that this 20,000 AF transfer will be there in future years. C-WIN is currently litigating against the 11,000 AF transfer from Buena Vista/Rosedale Rio Bravo (BV/RRB). The BV/RRB Castaic Lake Water Agency (CLWA) EIR claims that this 11,000 AF transfer MIGHT occasionally be up to 20,000 AF when the water is available. But this assumes that there is actually a legitimate source for this water. We believe that the water source for this transfer is the Kern River; and the Kern River is already completely appropriated. In any event, this transfer is subject to litigation and can not be counted on until the litigation is resolved. 12

Another significant problem with the transfers is that they may be coming from so called "surplus" water. It appears that permanent housing might be constructed based on water that is classified as "surplus" and therefore not reliable. "Surplus" water is only available after all Table A requirements have been fulfilled: "surplus" water is generally available only in wet years. This is what used to be known as Article 21 "surplus" water in the DWR supply contracts; the Monterey amendments refer to this as Article 56C "surplus" water (see "2006 SWPC's 100% Final Deliveries Preliminary" attachment #1.) We believe there is a "shell game" going on here. 13

If existing long term demand, as indicated in the DEIR 4.10-7, is 70,755 AFY plus Agricultural demand of 12,786 AFY, any additional new demand will clearly depend on the reliability of the SWP Table A amounts when cumulative impacts are considered. The "banked" water in the BV/RRB account (20,000 AF) and the Semitropic account (17,000 AF) are ONE TIME occurrences and not a regular yearly transfer. That could eliminate 37,000 AF from the bottom line when considering the long term demand. 14

The DEIR does not disclose that the contracts for the water transfers themselves are expressly reliant on, and derivative of, the Monterey Amendments, which are themselves contingent and non-final. The Castaic/Wheeler Ridge contract expressly references the outcome of PCL v. DWR as a condition that affects the transfers water availability. The set-aside Monterey amendments of 1995 lack the programmatic review required by the court that must be prepared by DWR as the lead agency. The existing set-aside Monterey Amendments are only in effect on an interim basis and are waiting for DWR to complete the new programmatic review in what is known as the Monterey Plus EIR. 15

Also, as mentioned in our first comment letter, the highly contested 41,000 AF transfer from the Kern County Water Agency should not be counted on either until there is finality in the courts. The discussion in the DEIR at 4.10-54 -55 regarding why the 41,000 AF transfer is final is misleading claiming that "the contract was never legally challenged and therefore, is considered permanent and in full force." (footnote #26 4.10-54) The DEIR goes on to say, "Since 2000, DWR has allocated and annually delivered the water (41,000 AF) in accordance with the completed transfer." (4.10-54) Let us be very clear; this 41,000 AF transfer has been challenged since the PCL v CCWA case was won by PCL in the 3rd District Court of Appeal in 2000. The current challenge to this 41,000 AF transfer by PCL and C-WIN is scheduled to be heard soon in the Superior Court in LA. To continue to assert that the 41,000 AF transfer is a done deal could have dire consequences if unknowing planners and public moved ahead on that assertion. The error that undermined the 1999 contract for the 41,000 AF transfer was not a "tiering" technicality, but a prejudicial error rooted in the PCL v. DWR decision, which must still be honored. The DEIR ignores the fact that DWR's own counsel states in its opposition brief in pending litigation on CLWA's 41,000 AF EIR (p. 20) that this transfer remains "subject to possible changes or curtailments." More on this shortly. 16

The DEIR claims that the SB 610 WSA for Landmark Village shows that there will be sufficient water for the entire Santa Clarita Valley through 2030, even in the driest years, therefore there is no problem with cumulative impacts or long term supplies. Again, the same problems arise with the WSA as with the DEIR. We question: 17

- the reliability of the SWP water when it is based on the questionable CalSim II Model and global warming has not been considered 18
- using the 41,000 AF transfer as a done deal in spite of current litigation 19
- counting on groundwater from an unadjudicated basin as if it were always going to be there 20
- depending on the 2005 CLWA UWMP which fails to address the likelihood that the planned development of the 21,000-home Newhall Ranch will not be able to utilize water currently applied to agricultural uses on the site for this development's proposed domestic uses, due to the excessive levels of total dissolved solids (TDS) in this water. If Newhall Ranch cannot utilize its existing agricultural water for its projected domestic uses, then its demand for potable water will compete with other projected demands, potentially exceeding available supplies. (Attachment #2) 21

The DEIR alludes to alternative water sources which might be available in a "Planned Water Supply Program" but then does not outline what that program might be. This is not useful information about providing adequate water supplies. 22

This proposed development is based on water supply assessment documents that are flawed and currently being challenged in court. These documents include, but are not limited to, CLWA's 2005 Urban Water Management Plan (UWMP) and DWR's Draft SWP Water Delivery Reliability Report 2005. This EIR is relying on a 41,000 acre foot transfer of permanent Table A Allocation from the Kern County Water Agency that is not finalized and is currently in litigation. 23

We believe that these documents and the purported water transfer are further compromised by recent court rulings that include; 24

3

- the **October 2005 ruling by the 3rd District Court of Appeal overturning the CALFED Record of Decision.** This decision required analysis of sending significantly less water south of the San Francisco/San Joaquin Delta which, if implemented, would curtail deliveries from the SWP.
- the **2nd District Court of Appeal ruling in California Oak Foundation v. City of Santa Clarita (2005) 133 Cal. App. 4th 1219, 1236,** that overturned the Gates-King EIR because it was based on the illegal 41,000 AF water transfer from Kern County. This DEIR is repeating the CEQA error identified in Cal Oak, "turning CEQA on its head" by suggesting that the "pre-ordained outcome of the process is continued use of the 41,000 AF of water." 24
- the **February 9th, 2006 3rd District Court of Appeal ruling in which Golden Gate Audubon** prevailed and the court ordered that existing salinity standards in the Bay Delta be upheld; and the **subsequent Order by the State Water Resources Control Board (SWRCB) requiring DWR and the CVP to shut down their pumps** if the salinity standards are not met which means that more water must be left in the San Joaquin River and the Bay Delta and therefore there is less water to pump to southern California.

Because of the recent realization that several species of fish in the Bay Delta including the delta smelt, split tail, winter run salmon and several others, are on the verge of extinction and that a very likely cause of that problem is over pumping in the Delta, it is very important for developers in southern California to start making the connection that there is very likely to be less water in the SWP and the CVP available to them. Global warming also exacerbates this problem. 25 26

The recent attempts by the SWP and the CVP to pump up to 27% more water out of the Bay Delta as part of what is known as the South Delta Improvement Project (SDIP) is soundly critiqued by the California Sportfishing Protection Alliance (CSPA) in their comments submitted to DWR February 7, 2006 (see attachment #3.) 27

We have recently learned that the National Marine Fisheries Service has suspended formal consultation for the SDIP until more studies have been completed (Attachment #4). This is significant because the SWP Contractors were using the SDIP as a way to get up to 27% more water out of the dying San Joaqin Delta; this letter from the National Marine fisheries Service stops that.

ISSUES:

1. Water Reliability

CLWA is relying on the **2005 SWP Delivery Reliability Report** which is still full of "paper water" and relies on the illegal 41,000 AF water transfer from the Kern County Water Agency. "Paper water" is water that exists as "a hope and a prayer" (to quote the Third District Court of Appeal in the PCL Monterey case) because the original SWP contracts had allocations of up to 4.23 million acre feet yet the reality is that the average actual annual delivery between 1990 and 2000 was a mere 1.86 million acre feet. The 2005 Reliability Report makes it appear that 77% of the SWP Table A Allocation is available for development purposes. Given actual historical average deliveries when the SWP contractors were requesting as much as they could get, DWR could not even deliver 50 percent. **The SWP has promised to deliver 4.23 MAF a year. In reality, between 1990 and 2000, the SWP actually delivered only 1.86 MAF a year.** This is hardly 77%; it is actually under 50%. It is critical for land-use planners to have a document that is honest about what actual, wet water is available. 28

4

I have attached the December 19, 2005 comments on the deficiencies of the 2005 SWP Reliability Report submitted by Physicist and Systems Analyst Arve Sjovold (attachment #5). I have also attached the December 22, 2005 comments on the deficiencies of the 2005 SWP Reliability Report by PCL Water Program Manager Mindy McIntyre (attachment #6). 29

CALSIM II is the computer model upon which DWR bases its water reliability report. The peer review document of the DWR Water Reliability Reports, the December 4, 2003 "A Strategic Review of CALSIM II and its Use for Water Planning, Management, and Operations in Central California" is highly critical of the CALSIM II model and therefore this model should not be relied upon as factual. The peer review document needs to be considered when the actual numbers are calculated for planning and development purposes when SWP water is being considered as a water source. The **biggest problem with the CALSIM II model as I understand it, is that it takes groundwater as an unlimited resource**. This leads to a false impression of what water is actually available. I have attached a critique of CALSIM II for the record. "A Strategic Review of CalSim II and its Use for Water Planning, Management, and Operations in Central California" dated December 4, 2003 submitted to the California Bay Delta Science Program Association of Bay Governments (attachment #7.) Please also see "Additional Comments on CalSim II Pertinent to the Temporary Restraining Order" by Arve Sjovold regarding the Injunction granted by the Court in the InterTie case (attachment #8.) In addition, we submit "Musings on a Model: CalSim II in California's Water Community", 3/05 (attachment #9.) 30

More recently, "An Environmental Review of CalSim II" by Jeffrey T. Payne and David R. Purkey, November 2005, concludes "…we are left with the profound impression that it (CalSim II) is not a tool that can - under its current formulation – fully address the legally required water management objectives. CalSim II holds that the environment is a constraint on system operations, not one of the objectives for which the system should be managed." (attachment #10.) Also attached is a critique of CalSim II by Jan de Leeuw, Distinguished Professor and Chair CLA Department of Statistics, dated October 23, 2005 (attachment #11.) I have also attached three comment letters concerning the CalSim II modeling by Arve Sjovold; "Response to Director Johns' Letter of September 22, 2005 on CalSim II" (attachment #12), "Some Insights on Water Deliveries to Settlement Contractors", October 24, 2004 (attachment #13); "On the Adequacy of CalSim II for Environmental Impact Analysis and SWP Reliability Analysis", August 12, 2004 (attachment #14.) All of these documents clearly lay out the problems for anyone who wants to rely on CalSim II as the predictor of reliability for the SWP.

5

Global Warming must be taken into consideration when calculating water reliability in California. Global warming has not been factored in to the reliability of the water supply being considered. The consensus of scientists who are studying global warming concludes that it will snow less, rain more and the snow will melt sooner giving us a rush of water in the Spring rather than the snow pack acting as a reservoir as it has in the past. C-WIN incorporates "Emissions Pathways, Climate change, and Impacts on California" (Attachment #15.) **DWR** recently came out with a report titled **"Progress on Incorporating Climate Change Into Management of California's Water Resources"**, July 2006. This DWR report attempts to incorporate climate change into CALSIM. Arve Sjovold did a review of that report and concluded, "that it too was seriously flawed for the purposes intended. It does a decent job on reviewing the extant literature on climate change but its quantitative analyses have very little to do with the issues that attend climate change. For example, when they attempt to calculate the effect on stream runoff in the northern Sierra, they take gross estimates from the climate change models, use a more detailed runoff model (which may or may not be a good model) to develop a scale factor to ramp up peak runoff forecasts, but use this scale factor as a multiplier on a base year that is one of the driest in history. In effect, they show that the increase in runoff is not very large and they use their estimates of this increase to drive their quantitative studies of Delta behavior. I found practically nothing of value in their quantitative studies that really goes to the heart of the climate change problem." (Attachment 15 (a)). 31 32

Now, with the recent **3rd District Court of Appeal decision, the RCRC decision (JCCP No. 4152)** setting aside the CALFED EIR and overturning the CALFED ROD because of the failure of the CALFED EIR to analyze sending less water south of the San Francisco Delta, it is imperative for CLWA to be cautious in reporting the SWP reliability. 33

The **Castaic Lake Water Agency 2005 Urban Water Management Plan** is flawed and is currently being challenged in the courts. Like everything else, the CLWA UWMP is relying on the illegal and un-finalized 41,000 AF water transfer from the Kern county water Agency. Please see C-WIN's comments dated October 25, 2005 regarding the Draft CLWA UWMP (Attachment #16) and comments submitted by the Planning and Conservation League dated October 21, 2005 (attachment #17.) 34

Relevant here are comments submitted by C-WIN (attachment #18) and PCL (attachment #19) in opposition to the **Newhall County Water District's SB 610 Water Supply Assessment.** This WSA is flawed in part because it is relying on the illegal and un-finalized 41,000 AF water transfer from the Kern county Water Agency. 35

"**Paper water**" is also in the Central Valley Project (CVP) system. Please note the comments by Senior Judge Lawrence K. Karlton in his Federal District Court decision dated July 28, 2005 concerning the lack of water in many miles of the San Joaquin River because of the operation of the Friant Dam (attachment #20.) This is very damaging for expectations that there will be enough water to augment the current amount being sent to Southern California 36

2. 41,000 AF Water Transfer from Kern County Water Agency to CLWA is NOT final; several court cases exist regarding this transfer

CLWA is relying on the transfer of 41,000 AF of agricultural water allocation from the Kern County Water Agency that is currently under litigation. The DEIR does not disclose that any non-Monterey transfer would be subject to the Article 18(a) agricultural cut-backs during shortages making this non-firm water of little value for residential and commercial development. Without the DWR Monterey Plus EIR being final, and with the current litigation, CLWA should not be citing 95,200 AF as its "firm" SWP allocation. 37

The 41,000 AF transfer was specifically singled out as NOT final and still under the cloud of litigation; which is exactly where it still is.

CLWA should be using 54,200 AF not 95,200 AF as its Table A Allocation for SWP water.

3. SWP Contract Articles 18 (a) & (b) issues

CLWA is a municipal water agency and a great deal of its imported water is coming from the State Water Project. Much of this imported water is being relied upon for building housing units in the Newhall Land and Farming area. The 41,000 AF of proposed transfer water from the Kern County Water Agency is agricultural, and DWR has not finalized the Monterey Plus EIR, therefore it is imperative that this draft UWMP wait until the Monterey Plus EIR becomes final before counting on the 41,000 AF water transfer. Article 18(a) of the SWP water contracts requires that agriculture take the first cut backs in SWP deliveries during drought years. This is a very important safe-guard for municipal water supplies. Article 18(b) states that DWR will only promise what it can actually deliver on a long range basis, thus eliminating "paper water", water that really doesn't exist. One of the most contentious parts of the PCL Monterey litigation was the fact that implementation of Article 18(b) was never analyzed as an alternative. 38

4. Other Issues affecting proposed water transfers

The following are some, but perhaps not all, of the other issues affecting proposed water transfers: 39

a. Impacts from transferring area.

b. Water quality issues about putting pumped water back into the SWP aqueduct.

c. SWP aqueduct carrying capacity.

d. How does this affect the negotiations on the Monterey Plus EIR?

All of these questions must be dealt with before CLWA can rely on such big numbers for water availability in the 2005 draft UWMP. 40

For the above reasons, C-WIN respectfully requests that this commission not approve the DEIR for the Landmark Village Project until such time that a safe, reliable and adequate water supply be identified. C-WIN requests that this Commission rely only on 54,200 AF of SWP as their Table A amount and that because of serious critique of the SWP Water Delivery Reliability Report, that this 54,200 AF be relied on only at half its face value. The existing "paper water" must be removed from the system to protect the people who already live in the CLWA service area. 41 42

C-WIN incorporates all other comments opposed to this DEIR. 43

Sincerely,

Carolee K. Krieger

Carolee K. Krieger, President

808 Romero Canyon Road

Santa Barbara, CA 93108

PH: (805) 969-0824

Attachments:

1. 2006 SWPC's 100% Final Deliveries, Preliminary

2. Letters from Sierra Club (10/21/05) and Santa clarita Organization for Planning and the Environment (10/24/05) re: 2005 CLWA UWMP

3. "CSPA Comments on the South Delta Improvement Program, Draft EIS/EIR" by Bill Jennings, chairman and Executive Director, CSPA, 2/7/06 (50 pgs.)

4. Letter from NOAA National Marine Fisheries Service 1/11/07 re: SDIP

5. "Comments on the Draft SWP Reliability Report 2005" by Arve Sjovold, 12/19/05 (4 pgs.)

6. "Comments on Public Review Draft of the SWP Delivery Reliability Report 2005" by Mindy McIntyre, PCL Water Program Manager, 12/22/05 (20 pgs)

7. "A Strategic Review of CALSIM II and its Use for Water Planning, Management, and Operation in Central California" by A. Close, W.M. Haneman, J.W. Labadie, D.P. Loucks (Chair), J. R. Lund, D.C. McKinney, and J.R. Stedinger, December 4, 2003 (129 pgs)

8. "Additional Comments on CALSIM II by Arve Sjovold, Feb. 7, 2006 (1 pg)

9. San Francisco Estuary & Watershed Science, March 2005 "Musings on a Model: CALSIM II in California's Water Community." (13 pgs)

10. "An Environmental Review of CalSim II" by Jeffrey T. Payne and David R. Purkey. 11/05 (65 pgs)

11. "Response to Gerald Johns' Memo" by Jan de Leeuw, 10/23/05 (3 pgs)

12. "Response to Gerald Johns' Letter on CalSim II", by Arve Sjovold, 10/2/05 (3 pgs)

13. "Some Insights on Water Deliveries to Settlement Contractors" by Arve Sjovold, 10/24/04 (1 pg)

14. "On the Adequacy of CalSim II for Environmental Impact Analysis and SWP Reliability Analysis" by Arve Sjovold, 8/12/04 (7 pgs)

15. "Emissions Pathways, Climate Change, and Impacts on California", August 24, 2004 (6 pgs)

15(a). "Comments on DWR's Technical Memorandum", "Progress on Incorporating Climate Change into Management of California's Water Resources", July 2006 by Arve Sjovold 9/2/06 (5 pgs)

16. C-WIN Comment Letter RE: Draft 2005 CLWA UWMP dated October 25, 2005 (3 pgs)

17. PCL Comment Letter RE: CLWA Draft 2005 UWMP dated October 21, 2005 (10 pgs)

18. C-WIN Comment Letter dated March 8, 2006 RE: SB 610 WSA for Gate-King (4 pgs)

19. PCL Comment Letter dated March 9, 2006 RE: SB 610 WSA for Gate-King (5 pgs)

20. Federal District Court Decision (partial) by Senior Judge Lawrence K. Karlton dated July 28, 2005 concerning the de-watering of the San Joaquin River by the building of the Friant Dam (7pgs)

9

ENV-28

attachment #1 (1pg)

ENV-28

2006
SWPC's 100%
FINAL DELIVERIES
PRELIMINARY

	2006 100% Approved Table A Allocation	2006 Table A - Balances: Delivered	Used for EWA, Water Bank Exchange, Flexible Storage Payback, or O'Neill exchanges *(Transactions)	Sold to Turnback	Carry Over Art.56C (06-07) Requested	Carry Over Art.56C (06-07) Remaining	Carry Over Art.12E Art.45F (06-07) Requested	Carry Over Art.12E Art.45F (06-07) Remaining	Carry Over Lost on 12/31/06	Unused ("left on table")	2005 Table A Carryover Deliveries: Art.12E or Art.45F	Art.56C Art.14B, Art.56CFLX	subtotal	Pool A and Pool B	Ur
FEATHER RIVER															
County of Butte	1,200	468			-				-	732			-		
Plumas County FC&WCD	324	-							-	324			-		
City of Yuba City	9,600	4,148		4,120	-				-	1,332			-		
Subtotal	11,124	4,616	-	4,120	-				-	2,388	-	-	-	-	
NORTH BAY															
Napa County FC&WCD	22,550	7,312			11,275	3,955			7,320	11,283		172	172		
Solano County WA	47,306	12,070			23,653	8,297			15,356	26,939		390	390		
Subtotal	69,856	19,382	-	-	34,928	12,251			22,677	38,223	-	562	562	-	
SOUTH BAY															
Alameda County FC&WCD, Zone 7	80,619	50,785			29,834	14,139			16,695	15,695		2,252	2,252	491	
Alameda County WD	42,000	39,117			2,883	2,883			-	-		1,331	1,331	256	
Santa Clara Valley WD	100,000	47,344	-		50,000	17,538			32,462	35,118		524	524	-	
Subtotal	222,619	137,246	-	-	82,717	34,560	-	-	48,157	50,813	-	4,107	4,107	747	
SAN JOAQUIN VALLEY															
Oak Flat WD	5,700	4,118			400	400			-	1,182		17	17	107	
County of Kings	9,305	8,991			305	305			-	8			-	173	
Dudley Ridge WD	57,343	55,343			2,000	2,000			-	-		-	-	1,088	
Empire West Side ID	3,000	1,500					1,500	526	974	974	658		658		
Kern County WA	998,730	942,307	19,575		30,088	30,088			-	6,760		5,418	5,418	18,810	
Tulare Lake Basin WSD	95,922	48,381	-		47,541	16,823			30,738	30,738	-		-	1,787	
Subtotal	1,170,000	1,060,620	19,575	-	80,354	49,616	1,500	526	31,712	39,663	658	5,435	6,093	21,745	
CENTRAL COASTAL															
San Luis Obispo County FC&WCD	25,000	3,382			-				-	21,618			-		
Santa Barbara County FC&WCD	45,466	19,255			22,743	7,977			14,766	18,254		-	-	-	
Subtotal	70,466	22,637	-	-	22,743	7,977	-	-	14,766	39,872	-	-	-	-	
SOUTHERN CALIFORNIA															
Antelope Valley-East Kern WA	141,400	76,623			11,666	11,666			-	53,111		3,761	3,761		
Castaic Lake WA	95,200	56,758			38,442	16,696			21,746	21,746		3,905	3,905		
Coachella Valley WD	121,100	121,100			-				-	-	-	-	-	-	
Crestline-Lins Arrowhead WA	5,800	257			-				-	5,543			-		
Desert WA	50,000	50,000			-				-	-	-	-	-	-	
Littlerock Creek ID	2,300	-		1,500	-				-	800			-		
Metropolitan WDSC	1,911,500	1,103,538	-		200,000	200,000	30,000	30,000	-	577,962		156,532	156,532	11,638	
Mojave WA	75,600	32,496			37,900	13,294			24,606	30,010		1,518	1,518		
Palmdale WD	21,300	10,374			10,650	3,736			6,914	7,190		335	335	130	
San Bernardino Valley MWD	102,600	31,902			-				-	70,698		3,427	3,427		
San Gabriel Valley MWD	28,800	13,524		13,640	-				-	1,636			-		
San Gorgonio Pass WA	7,000	4,262			-				-	2,738			-	-	
Ventura County FCD	20,000	1,850		15,000	-				-	3,150			-		
Subtotal	2,582,800	1,502,684	-	30,140	298,658	245,392	30,000	30,000	53,266	774,584	-	171,478	171,478	11,768	
TOTAL	4,126,885	2,747,185	19,575	34,260	519,400	349,796	31,500	30,526	170,578	945,543	658	181,582	182,240	34,260	

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ENV-28
attachment #2 (8pgs)

10-21-05

10-25-2005 P05:03

Castaic Lake Water Agency
27234 bouquet Canyon Rd.
Saugus, CA 91350

Re: CLWA Urban Water Management Plan 2005 Comments on Final Draft

Thank-you for the opportunity to comment on the Urban Water Management Plan. As we did not have the time or wherewithal to read each preliminary draft, we felt commenting on the draft that you intend to present to the Board would be the most efficient. We regret that this document was not available until 10-21. This allows very little time to evaluate the changes you have made. We will try to proceed with our comments according to sections of the plan.

Water Resources (Chapter 3.0)

Saugus Aquifer

We appreciate your agency's efforts to more accurately portray the loss of supply from wells closed down due to ammonium perchlorate pollution. We notice however, that production is reduced only in the Saugus Aquifer even though two wells were affected in the alluvium and one remains closed. There should be some indication of this reduced capacity.

Production in tables 3-9 and 3-10 for Valencia Water Co. do not correlate with production reports provided to the CPUC in Valencia's annual reports (see Exhibit 1). This data must be corrected.

Santa Clara Alluvial Supply

The Agency has once again increased the amount of water that they say can be lied upon from the Santa Clara River based on yet another study of alluvial yield. (See excerpts from previous reports attached as Exhibit 2) This report, "Analysis of Ground water Basin Yield (2005) does not make any attempt to analyze or even mention the effect of increased pumping on surface flows and instream habitat uses. The Santa Clara River is home to several endangered species and species of special concern including the UnarmoredThree-spine Stickleback fish. Failure to include provisions for instream flows and public trust rights is a serious flaw in this study. Water quality issues from increased chlorides due to increased recharge from SWP supply may also affect species and habitat. Increased pumping from the Santa Clara River should not proceed without an analysis of the effects on habitat and endangered species.

3

01329

Further, the report relies on estimated agricultural pumping from ground water to formulate historical data. If this pumping is over-estimated as suggested by Fox Ground Water Basin (see attached correspondence Exhibit 3), then the whole report overstates the available sustainable yield. Therefore, a scenario based on lower agricultural usage should be developed and included.

This is ONLY a model. What happens if the model does not accurately predict negative impacts? There should be a planned review of the model for accuracy of calibration. Any deviations should trigger immediate notification to all agencies. We feel it is inappropriate and inaccurate to once again use a higher yield from the Santa Clara River without evaluation of the above impacts and verification that the model will function as predicted. we continue to be skeptical of a ground water model that was originally developed by consultants for the Newhall Ranch project and continues to be formulated by that same company.

Private well use is not adequately disclosed and counted in the model, nor is it accurately disclosed and included in the Urban Water Management Plan. (Please refer to information submitted by the SCV Well Owners Association.)

State Water Supply from Northern California
The Agency continues to rely on the disputed 41,000AF transfer although its General Manager, Dan Masnada, signed the Monterey Settlement Agreement stating that the transfer was not final (see appendix E of settlement and court order, exhibit 4). The Agency was also precluded from relaying on this transfer for water supply projects after 2001. (See Court Order). Reporting this water as available for supply is a violation of the Court Order.

Water available only over a short term contract period such as the Ventura water purchase and the stored supplies should not be listed in "existing supplies", but rather in a "back up supply" column. This water is not available for long-term housing supply and should not be used to approve additional housing. For example, water purchased from Ventura County on a short term basis should NOT be listed in existing supplies as it is only available for ten years. CLWA should remember the recent example of the Metropolitan Water District's reliance on extra Colorado River Water that is no longer available.

Stored water is all from 41,000 Monterey Agreement transfer and is under a litigation cloud. This fact should be indicated. Charts appear to indicate that stored water is available as a supply for new development when in fact the contracts are VERY short term (10 years). It should be clearly noted that this water can't be counted as a new supply.

01330

Use of the Draft 2006 DWR Reliability Report that the public has not had the opportunity to review is not acceptable. This report increases average year reliability to 77%. Such an increase may not be supportable, but since the public has had no opportunity to review the underlying assumptions, such as those areas disputed by the peer review of the last report, the public has no means of disputing those findings. Those assumptions include the assumption of unlimited use of ground water that is not really possible. We have attached the Peer Review of the 2002 Reliability Report (exhibit 5) and request that the water agencies address these issues. Otherwise, we suggest it would be most prudent to continue to use the reliability figures found in previous Bulletins 160 of 50% of supply available 80% of the time.

The SWP supply section should include an analysis that is consistent with the recent 3rd Appellate Court Decision setting aside the CalFed Decision EIR (Oct. 7th 2005, Regional Council of Rural Counties, v. DWR, excerpt attached as exhibit 6). This analysis should review a scenario with reduced water imports from Northern California.

Potential New Sources
Table 3-15 that lists desalination projects is purely speculative and inappropriate. This projects, for the most part, have not been funded nor have they received CEQA review. Any implication of water availability from such projects is not appropriate at this time. This table should be removed from the UWMP.

Water Quality (5.0)
There is no disclosure in this chapter that the pollution plume is *not* contained and continues to spread. There is no disclosure that clean-up at the source has not begun. It is unclear that the hydrological pollution containment plan is merely a model based on using existing wells. Models may not act as predicted and the pollution may not be hydrologically contained. There should be disclosure of this fact and some sort of immediate notification mechanism should the containment plan not work as predicted.

Newhall Land/Lennar will build its first several phases of Newhall Ranch by supposedly transferring their agricultural water to municipal uses. NO water quality evaluation for this use was identified in the UWMP. TDS levels tested at adjacent landfill indicated the water was not potable (levels exceeded 1500 PPM). Will this water be usable? the UWMP should address this problem.

Water stored in Kern storage banks may not really be available due to water quality problems in Semi-Tropic that may not conform to DWR standards for water wheeling in the aqueduct (see attached exhibit 7). If this is the case, DWR will not allow the water to be wheeled until it is treated. Also, lack of pumpback facilities should all parties request their allotments would preclude deliveries. Please provide updated water quality testing for these storage facilites and disclose delivery priorities of CLWA contracts.

01331

Increase in use of state water will increase chlorides in the river. The Upper Santa Clara is already out of compliance with the TMDL for chlorides. How will this be addressed? How will this water quality issue affect water supply? How will the agency correct this problem? These issues should be disclosed in the Plan.

Water Shortage (8.0)
It is our understanding that the SCV has only about 3 days storage in tanks and maybe a month of flex storage in Castaic Lake. Is this an adequate amount of water this side of the Tehachapis in an emergency? If an earthquake occurs on the San Andreas fault and closes the Edmundson pumping station, does the SCV have sufficient local supplies for the requisite repair time?

Thank-you for your time and attention to our concerns.

RACHEL MYERS
Conservation Coordinator
Angeles Chapter

01332

SCOPE
Santa Clarita Organization for Planning and the Environment
TO PROMOTE, PROTECT AND PRESERVE THE ENVIRONMENT, ECOLOGY AND QUALITY OF LIFE IN THE SANTA CLARITA VALLEY
POST OFFICE BOX 1182, SANTA CLARITA, CA 91386

10-24-05

Attn: Marylou Cotton
Castaic Lake Water Agency
27234 bouquet Canyon Rd.
Saugus, CA 91350

Re: 2005 CLWA Urban Water Management Plan

Dear Ms. Cotton:

Thank-you for allowing us this opportunity to comment on the Urban Water Management Plan.

We are especially concerned about the sustainability of the Santa Clara River, both for water supply and as habitat to support several endangered fish and amphibians. The Agency has once again increased the amount of water that it claims can be pumped from the Santa Clara River based on yet another study of alluvial yield, "Analysis of Ground Water Basin Yield (2005). This study does not make any attempt to analyze or even mention the effect of increased pumping on surface flows and instream habitat uses. Failure to include provisions for instream flows and public trust rights is a serious flaw in this study and the Agencies pumping program. As you are aware, increased pumping has resulted in higher levels of nitrates and increased chlorides due to recharge from SWP supply that may also affect species and habitat. Increased pumping from the Santa Clara River should not proceed without an analysis of the effects on habitat and endangered species. We have been requesting attention to this matter for over ten years now. Recovery and preservation of our natural treasures cannot occur without attention to this problem.

Further, the Basin Analysis relies on estimated agricultural pumping from ground water to formulate historical data. If this pumping is over-estimated as suggested by Fox Ground Water Basin (see attached correspondence), then the whole report overstates the available sustainable yield. Therefore, a scenario based on lower historical agricultural usage should be developed and included.

The UWMP also cites to the 2001 Slade report. However, this report states that, although under wet year circumstances up to 40,000AF may be pumped from the alluvium, Slade continues to state that "The Basic intent of the operational yield value is that it should not exceed the perennial (or average) [defined in all reports as 32,500AF, bracketed text added] yield of the ground water basin over multi-year wet and dry cycles". Your charts should indicate the perennial yield for planning purposes. Building houses to the higher wet-year yield will result in over-draft of the basin. It is important that planners know they must use the *average* amount of 32,500.

01850

According to information submitted by the SCV Well Owners' Association, private well use is not adequately disclosed and counted in the model, nor is it accurately disclosed and included in the Urban Water Management Plan. Our review of this information finds it to be reasonable and accurate. Failure to include this data comprises the validity of the UWM Plan and the Basin Analysis.

We also believe that the amount of recharge to the basin from imported water is substantially overstated in these reports. It is an established fact that water used for landscaping in semi-desert climes such as the Santa Clarita Valley is mostly lost to transevaporation. Loss of re-charge areas and increased velocity of flood flows due to narrowing of the river bed, also reduces re-charge. Therefore, pumping from the Santa Clara river should be reduced to avoid over-draft.

The UWMP relies on the Basin Analysis Model stating there is no over draft, yet there has been no study of subsidence or of the other indications of over draft that are occurring. These include increased nitrate levels and failure of previous water levels to recover even after last years occurrence of a 100 year record rain fall. Ignoring such indications would lead the public to believe that the Basin Analysis may have been influenced by the need for water supply to support new development. Indeed, it is a well-known fact that this model was originally developed by consultants for the Newhall Land/Lennar Corporation to support water supply for their Newhall Ranch Project. This same consulting firm has produced the Basin Analysis. Other consultants for Newhall Land have failed to disclose all information (i.e., the fiasco surrounding the destruction of the endangered SF Spineflower on the Newhall Ranch property.). Such omissions cast doubt on the neutrality and validity of the Analysis. We request that these issues be addressed before the UWMP is approved.

We note the Plan's efforts to more accurately portray the loss of supply wells closed down due to ammonium perchlorate pollution. We notice however, that production is reduced only in the Saugus Aquifer even though two wells were affected in the alluvium and one remains closed. There is no containment plan for the alluvial aquifer and the plume is obviously still spreading. There should be some indication of this reduced capacity and of the fact that there is no containment plan for the alluvium.

The November 2004 Stetson Report indicated there was insufficient information to support a pumping scenario of 35,000 AF from the Saugus AF (relevant pages attached). Further, the 1986 Slade Report and Regional Water Quality Basin Plan indicate a connectivity between the Saugus aquifer and the Santa Clara River alluvium. If one is pumped, it will reduce recharge to the other. This effect and the resultant reduction in supply that would occur, seems to have been ignored in the UWMP and the Basin Analysis.

We concur with other commentors that the Agency incorrectly continues to rely on the disputed 41,000AF transfer although its General Manager, Dan Masnada, signed the Monterey Settlement Agreement stating that the transfer was not final (see appendix E of settlement and court order, exhibit 4). The Agency was also precluded from relying on this transfer for water supply projects after 2001. (See Court Order). Reporting this water as available for supply is a violation of the Court Order. The Agency has attempted to remedy this situation by

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producing its own environmental document for this transfer. However, CLWA is well aware that such an action is in direct violation of the 3rd Appellate Court decision in this matter (PCL v. DWR, 2000). There is a good reason to insist that the lead agency be the Dept. of Water Resources. Huge transfers such as this should be given statewide review because of the serious impacts to parties on both the releasing and receiving ends. Although this document pretended to address agricultural issues, it was not circulated in the releasing areas. So individuals potentially harmed by the transfer had no knowledge of it, nor the opportunity to comment. Additional transfers will also have impacts on State Water Project facilities that will necessitate statewide review to ensure these impacts are addressed.

The water storage programs listed in the UWMP are all from 41,000 Monterey Agreement transfer and therefore under a litigation cloud. This fact should be indicated here, as well as in all areas where it is applicable. Charts appear to indicate that stored water is available as a supply for new development when in fact the contracts are VERY short term (10 years). It should be clearly noted that this water can't be counted as a new supply.

We concur with other commentors that use of the Draft 2006 DWR Reliability Report before the public has had the opportunity to review is not acceptable. This report increases average year reliability to 77%. Such an increase may not be supportable. Since the public has had no opportunity to review the underlying assumptions, including those areas disputed by peer review of the last report, the public has no means of disputing those findings. We concur that it would be most prudent to continue to use the reliability figures found in previous Bulletins 160 of 50% of supply available 80% of the time.

The SWP supply section should include an analysis that is consistent with the recent 3rd Appellate Court Decision setting aside the CalFed Decision EIR (Oct. 7th 2005, Regional Council of Rural Counties, v. DWR, excerpt attached as exhibit 6). This analysis should review a scenario with reduced water imports from Northern California.

We concur with and re-iterate the following comments made by the Sierra Club regarding water quality. There is no disclosure that the pollution plume is *not* contained and continues to spread. There is no disclosure that clean-up at the source has <u>not</u> begun. It is unclear that the hydrological pollution containment plan is merely a model based on using existing wells. Models may not act as predicted and the pollution may not be hydrologically contained. There should be disclosure of this fact and some sort of immediate notification mechanism should the containment plan not work as predicted.

Newhall Land/Lennar will build its first several phases of Newhall Ranch by supposedly transferring their agricultural water to municipal uses. NO water quality evaluation for this use was identified in the UWMP. The Plan should include such disclosure.

As the Agency is well aware, water stored in Kern storage banks may not really be available due to water quality problems in the storage area. Water pumped back from Semitropic water bank may not conform to DWR standards for water wheeling in the aqueduct. If this is the case, DWR will not allow the water to be wheeled until it is treated. There are no treatment

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facilities at this time. Also, lack of inadequate pumpback facilities to provide service in the event that all parties request their allotments also do not exist. Please provide updated water quality testing for these storage facilities and disclose delivery priorities and limitations of CLWA contracts.

Thank-you for your time.

Sincerely,

David Lutness

Dave Lutness
2nd Vice President

Attachments as indicated in the text.

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SDIP
CalSPA
(Mike J.)

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ENV-23
attachment
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(50 pgs.)

7 February 2005

Mr. Paul A. Marshall
Department of Water Resources
South Delta Branch, Draft EIS/EIR Comments
1416 9th Street, 2nd Floor
Sacramento, CA 95814

Via email to: marshall@water.ca.gov and sdip_comments@water.ca.gov

RE: CSPA Comments on the South Delta Improvements Program, Draft Environmental Impact Statement/Environmental Impact Report

Dear Mr. Marshall:

The California Sportfishing Protection Alliance, San Joaquin Audubon and Watershed Enforcers (hereinafter, CSPA) submit the following comments on the Draft Environmental Impact Statement/Environmental Impact Report (DEIS/R) of November 2005, by the California Department of Water Resources (DWR) and the US Bureau of Reclamation (BOR) concerning the South Delta Improvements Program (SDIP). We incorporate by reference the comments submitted by the Planning and Conservation League, Northern California Counsel of the Federation of Fly Fishers, Friends of Trinity River, California Trout and Richard Izmarian. We also incorporate the attached comments concerning the inadequacies of the DEIS/R's assessment of water quality impacts by Drs. G. Fred Lee and Ann Jones-Lee (Attachment 1).

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The environmental assessments for virtually every previous significant project in the Delta have promised benign or beneficial effects. All exacerbated existing conditions. It is frankly astonishing that, in the midst of attempts to understand the causes of the collapse of the Delta's pelagic fisheries, DWR has proposed significantly increased export pumping accompanied by a major modification of the hydrologic regime in the south Delta on the basis of a seriously flawed, inadequate and legally deficient document. That DWR and BOR are aggressively pushing this project at a time when numerous species in the Delta are in precipitous decline, with several hovering on the brink of extinction, speaks volumes about the values and intentions of its proponents.

The Administrative Record for the SDIP must comply with the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA) and carry out the statutory duty to provide decision-makers and the general public with a clear understanding of the consequences of the project.

An EIR is "an environmental 'alarm bell' whose purpose it is to alert the public and its responsible officials to environmental changes *before* they have reached ecological points of no return." *Village Laguna of Laguna Beach, Inc. v. Board of Supervisors* (1982) 134 Cal. App. 3d 1022, 1027 (emphasis added). Beginning with its artificial segmentation of the proposed project through to its failure to evaluate a reasonable range or project alternatives, the DEIS/R fails to provide an accurate depiction of the many significant environmental impacts that will result from approval of the SDIP. The massive length of the DEIS/R does not reflect a depth of environmental analysis, but instead impedes a comprehensive understanding of the project's impacts. This letter details some, but not all, of the inadequacies in the DEIS/R, which include:

- The document is based upon the "Biological Opinion (BO) on the Long-Term Central Valley Project (CVP) and State Water Project (SWP) Operations Criteria and Plan (OCAP)", which has been found faulty by an independent technical review team convened by the CALFED Bay-Delta Program whose findings were made public January 3, 2006. (Attachment 2) A report by the Department of Commerce's Inspector General also found the BO process violated government procedures (Attachment 3).

- The document does not consider an alternative that reduces exports from the Delta, per the Third District Court of Appeals Decision (RCRC et al v State of California, Attachment 4), which sets aside the CALFED PEIR because the PEIR improperly fails to discuss an alternative that requires reduced exports of water from the Delta.[1]

- Similar to the CALFED PEIR and the Third District Court of Appeals Decision (RCRC et al v State of California), the document does not adequately disclose the environmental impacts of diverting water from various potential sources to meet the CALFED Program's goals. In particular, the analysis of impacts to upstream reservoirs, upstream river fisheries and upstream recreation are not only inadequate, but grossly misleading.

- The larger CALFED program, which includes SDIP, CVP long-term contract renewal, the so-called "Napa Proposal" and other elements to integrate CVP and SWP operations requires an EIS/EIR which amends the 1986 Coordinated Operating Agreement between DWR and BOR to include the regulatory baseline as it exists today prior making long term, potentially irretrievable, commitments of natural resources by building the barrier program in the Delta.

- The SDIP DEIS/EIR is premature in assuming that ever-larger deliveries of water to the San Luis Unit of the CVP can be justified, as the ROD for the San Luis Unit Drainage Re-Evaluation has not been completed. The National Economic

[1] Although the Supreme Court recently granted review of this case, the reasoning and conclusions of the Court are based on well-established CEQA law.

Analysis for that project identified that land retirement would be the most cost effective alternative, which could actually allow for **reduced** Delta exports.

Based on myriad inadequacies, prudence and a decent respect for the Delta Estuary we recommend that DWR and BOR withdraw the proposed DEIS/R for this project. We also request that the comment period be extended another 30 days in order to allow adequate time to review this complex and lengthy document.

I. The DEIS/R Improperly Defines the Proposed Project.

In order for an EIR to adequately evaluate the environmental ramifications of a project, it must first provide a comprehensive description of the project itself. "An accurate, stable and finite project description is the *sine qua non* of an informative and legally sufficient EIR." *San Joaquin Raptor/Wildlife Rescue Center v. County of Stanislaus* (1994) 27 Cal. App. 4th 713, 730 (quoting *County of Inyo v. City of Los Angeles* (1977) 71 Cal. App. 3d 185, 193). As a result, courts have found that even if an EIR is adequate in all other respects, the use of a "truncated project concept" violates CEQA and mandates the conclusion that the lead agency did not proceed in the manner required by law. *San Joaquin Raptor*, 27 Cal. App. 4th at 729-30. In particular, an inadequate project description hinders the evaluation of project alternatives in violation of CEQA.

The proposed South Delta Improvement Program, which has been promoted as a comprehensive solution to problems in the South Delta, and described as such in the CalFed Delta Improvements Plan, is arbitrarily divided into two stages:

- Stage I is presented as the selection of the physical/structural component of the program, the preferred alternative being the construction of four permanent physical barriers, and operation within the existing export constraints of the two water projects (CVP and SWP).

- Stage 2 is presented as the selection of a preferred operational component for the program. This selection process will follow the selection of the alternative in Stage 1, and will be subject to a Draft Supplemental EIS/EIR and a full public review. It is at this stage that the relaxation of the existing COE export constraints will be addressed.

The proposed staging approach (see ES-9) does not allow for a complete discussion of key elements such as alternatives to the proposed operation project. Specifically, each of the alternatives evaluated assumes that Stage 2 will include the full diversion of 8500 acre feet. The operation studies included in the Draft EIR/EIS, in a perhaps revealing way, do not include an alternative that conforms to the staged decision process. Operation studies described in this document include:

No Project	6680	No barriers, dredging, or ag. diversions
Missing Alt.	**6680**	**Full Barriers, dredging and ag. diversion**
2A	8500	Full Barriers, dredging, and ag. diversions
2B	8500	Full Barriers, dredging, and ag. diversions
2C	8500	Full Barriers, dredging, and ag. diversions

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3B	8500	No Grantline Canal Barrier, dredging, and ag. div.
4B	8500	No Agricultural Barriers, dredging, and ag. div.

It is clear that an alternative (the "Missing Alt." shown above in bold, underlined) which includes the barriers, dredging, and agricultural diversion extensions (physical/structural component), but which is limited to the 6680cfs pumping limitation (no operational component), is missing from the mix. Therefore it will be impossible to separate the effects of Stage 1 from Stage 2 in the analysis.

The DEIS/R further undermines the effectiveness of the project description through its reliance on the artful use of semantics begins to describe the water transfers. For example, the DEIS/R separates the CVP/SWP contract water deliveries, from the EWA water, the refuge water supplies, and the water transfers for other parties. Thus, the document states that the effects are limited to a 1% to 3% increase in CVP/SWP contract deliveries and for the environmental water (Page ES-5). Yet another 2% increase is then subsequently assigned to water transfers. The Estuary is affected by the whole of the exports, and this "piece-mealing" of the analysis is inappropriate. The analysis should be based on the effects of the 3% to 5% combined increase in exports.

The narrow definition of the operational component of SDIP to increasing exports in four versions of 8,500 cfs does not allow a thorough discussion of alternative methods of increasing water supply reliability for CVP and SWP export contractors. Despite the DEIS/R's claim that the alternatives were developed through a "stakeholder process" the range of alternatives is far too narrow and was focused only on increasing exports to 8500 cfs at the SWP pumps in the Delta. This narrow focus was inherent in naming the stakeholder group "the 8500 Stakeholder Process" at DEIS/R Vol. 1a, 2-9.

In the face of the State Appeals Court ruling on the CalFed EIS/R and ROD we are astounded to find that the document does not consider reductions in exports from the Delta as a means of solving the south Delta problems. The State Appeals Court was quite clear on this issue, and this point alone requires the preparation of a new draft, which includes and analyzes the relevant environmental improvement from choosing such an alternative.

Yes

II. The Long Term CVP/SWP SDIP/OCAP BO is Inadequate

The SDIP project is based on Endangered Species Act compliance through the CVP/SWP OCAP. A revised BO should be prepared with adequate analyses to determine jeopardy to listed species, including winter and spring run Chinook, steelhead, and Delta smelt. An independent CBDA sponsored review by a team of 6 scientists recently concluded that the SDIP-OCAP BO for salmon had the following deficiencies:

1. **Global climate change was not considered.** The BO assumes that the climate and hydrologic regime during the last century will persist into the future. The Panel does not believe that global climate change (e.g.,

temperature warming), and the consequent temperature and hydrological changes, received adequate treatment in the BO. This deficiency resulted in an important uncertainty being ignored that could affect the characterization of the risk to the ESUs.

2. **Variability in ocean productivity, and its affect on fish production, was not incorporated into the analyses.** The current status of the listed populations is, in part, an outcome of recent favorable ocean conditions. What will the status of listed populations be under less favorable conditions that may occur in the near future? By not including variability of ocean conditions in its analysis, the BO does not adequately address whether or not the listed populations are sufficiently large to survive a period of poor ocean conditions.

3. **Unknowns or uncertainty were either not adequately incorporated into the analyses, or their incorporation was not clearly explained.** In some cases, uncertainties were simply ignored or their consideration was deferred to other future analyses or other in-progress biological opinions. For example, Table 9 in the BO (page 193) summarizes the effects of the proposed project on the listed ESUs, but Table 9 fails to list eleven additional effects mentioned in the text of the BO. Ignoring or deferring the consideration of these effects in analyses does not give the listed species the required benefit of the doubt.

4. **Some models and analyses appeared to be flawed.** The application of monthly temperature models to anadromous fish studies is a point of concern. Of particular concern is the adoption, with little discussion, by NMFS of these monthly results both for assessing potential impacts and for setting thermal criteria. In addition, the data used to develop relationships between water temperature and salmon gamete, egg, and alevin mortality was not the best available.

5. **Greater consideration should be given to genetic and spatial diversity in the ESUs.** Too little consideration was given to the genetic and spatial diversity aspects of the ESUs. The Central Valley Technical Recovery Team noted that the "dependent" populations of spring Chinook and steelhead occupy marginally suitable habitats that either depend on migrants from the nearby streams or operate as a meta-population in which each stream is not individually viable, but the group persists. These dependent populations are a valuable resource because they exist in marginal environments, may contain valuable genetic attributes (e.g., higher temperature tolerance), and may serve as links with other populations in ways that increase the viability and resiliency of the ESUs over long time scales. The BO did not adequately treat the genetic and spatial diversity aspects in their analysis.

The DEIS/R may not rely on an inadequate environmental document to address and mitigate the environmental impacts of the SDIP. *Santa Clara River v. Castaic Lake* (2002) 95 Cal. App. 4th 1373. Clearly, the BO for the SDIP is inadequate and must be revised and completed prior to release of a new DEIS/R. In order to fully disclose impacts and mitigation measures, the revised BO must be completed prior to release of the new DEIS/R.

III. The DEIS/R Fails To Consider A Reasonable Range Of Alternatives

"An EIR for any project subject to CEQA must consider a reasonable range of alternatives to the project, or to the location of the project, which (1) offers substantial environmental advantages over the project's proposal . . .; and (2) may be feasibly accomplished in a successful manner considering the economic, environmental, social and technological factors involved." *Citizens of Goleta Valley v. Board of Supervisors* (1990) 52 Cal.3d 553, 566. "The discussion of alternatives shall focus on alternatives to the project or its location which are capable of avoiding or substantially lessening any significant effects of the project, even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly." CEQA Guidelines § 15126.6(b).

The DEIS/R must consider feasible alternatives that would obviate the necessity for increased export capacity. These include: 1) evaluation of the cost effective retirement of marginal farmland (including, but not limited to the selenium-laced soils of Westlands), 2) comprehensive agricultural and urban water conservation (including recycling, reclamation and the capture and treatment of surface/stormwater runoff), and 3) implementation of an aggressive desalination program in Southern California. It is likely that these alternatives would be environmentally superior and considerably more cost effective than the billions of dollars required for the SDIP. The cost of desalination is approaching the $750 to $1,000 range. Point and non-point control programs, like TMDLs, are problematic and prohibitively expensive. Conservation is clearly more cost effective than heavily subsidized export water. The DEIS/R should also examine alternatives that would reduce or eliminate the need for dredging (i.e., setback levees). Should the aforementioned alternatives be rejected, the DEIS/R must contain a discussion of why they were considered infeasible.

desal brackish water or waste water

In October, the California Third District Court of Appeals set aside the CALFED ROD because, among other things, the PEIS for CALFED did not consider an alternative that **reduces** exports from the Delta. In January, the California Supreme Court agreed to review the case. It is therefore shocking to see that similar to the flawed CALFED PEIS, the SDIP DEIS/R does not contain an alternative that reduces Delta exports. This is particularly arbitrary since the first phase of the 8500 cfs project is supposedly only for fish and wildlife purposes and less pumping would seem to be a feasible alternative to meet the purpose and need or objective of the physical barriers project. This is a serious deficiency in the SDIP DEIS/R and must be remedied by development of an alternative that does not require an increase in use of the SWP's pumping capacity at Clifton Court. The "less export" alternative should be evaluated in light of alternative water supplies for

Delta exporters available and identified in numerous public reports, including DWR Bulletin 160-05.

The DEIS/R's justification for increased exports south of the Bay-Delta Estuary is predicated upon Bulletin 160-98. However, the recently released California Water Plan Update 2005 demonstrates that, under current trends, south of Delta water demands actually decrease in 2030, even accounting for the increased population. The Water Plan Update provides a reasonable scenario under it's Less Resources Intensive assumptions that water use statewide could decrease by up to 500 million acre feet, even without additional water conservation efforts taken by California water agencies. Additionally, a recent report by the Pacific Institute titled *California Water 2030: an Efficient Future* demonstrates that California water use in 2030 could be 20% below 2000 levels, even with a growing population and a healthy economy. Basing water demand upon outdated and discredited information while ignoring more recent relevant information is misleading and unacceptable. The DEIS/R must be withdrawn and reanalyzed using a reduced export alternative.

CSPA supports Trinity County's suggestion for development of a "Land Retirement Alternative" which returns water to the environment and other water users as follows:

A revised SDIP DEIS/R should expand on Appendix A of the Trinity River Fishery Restoration Supplemental EIR (shown below revised as Table 1). Table 1 portrays a rough estimate of the potential water savings associated with the retirement of lands within the San Luis Unit, Delta-Mendota Canal Unit and the San Joaquin River Exchange Contractors of the Central Valley Project that are expected to require drainage service. The purpose of the Trinity County analysis was to estimate an amount of CVP water that could be obtained from the retirement of drainage-impacted lands in the 3 units of the CVP. The water savings would then be dedicated to increase cold-water storage, drought protection, and recreational use in upstream reservoirs. Use of this water should be dedicated to environmental restoration, water quality, or other water users as needed. The total land with drainage problems is 376,751 acres in the water districts identified below in Table 1, but other problem areas also exist outside of the SLU and DMC areas, as identified in Table 2 below.

The analysis below shows that land retirement could save 793,056 AF in total CVP contracted water, which would have been an actual reduction in demand of 568,373 AF in 2002, the same year as the unprecedented Klamath Fish Kill on the Trinity River, one of the CVP source rivers. Every increasing diversion from the Delta export projects effect water conditions on all Central Valley Rivers and are causing a decline in species numbers and habitat quality. Permanent land retirement and dedication of water to other CVP project purposes would result in significant benefits from reduced pollution from drainage water, reduced CVP project power usage, increased ability to meet various water quality standards, increased water storage, increased M&I water supplies, and more water for environmental needs such as fishery flows and wildlife refuges. Land retirement could also be the basis for an alternative that reduces exports from the Delta, per the Third District Court of Appeals decision on the CALFED PEIR.

Table 1 from the Draft Trinity River Fishery Restoration Supplemental Environmental Impact Report (Trinity County 2004, as amended 1/24/05 and 2/16/05)

CVP

	Acres	Acres Requiring Drainage Service	% of District Requiring Drainage Service	Max CVP Contract Amount (AF)	Max CVP Contract Water Savings (AF)	2002 CVP Contract Deliveries (AF)	2002 CVP Water Savings (AF)
Broadview Water District	9,515	9,515	100.00%	27,000	27,000	18,588	18,588
Panoche Water District	39,292	27,000	68.72%	94,000	64,593	66,743	45,863
Westlands Water District	***604,000***	***298,000***	***49.34%***	***1,154,198***	***569,455***	***776,631***	***383,172***
Eagle Field	1,438	1,435	99.82%	4,550	4,542	2,869	2,864
Mercy Springs	3,589	2,417	67.35%	2,842	1,914	4,679	3,151
Oro Loma	1,095	,1095	100%	4,600	4,600	3,173	3,173
Widren	881	881	100%	2,990	2,990	2,094	2,094
Firebaugh	23,457	23,457	100%	85,000	85,000	85,000	85,000
Cent. Cal ID	149,825	4,951	3.30%	532,400	17,569	532,400	17,569
Charleston Drainage District (portion of San Luis WD with drainage problems)	4,314	3,000	69.54%	8,130	5,654	Not avail	Not avail
Pacheco Water District	5,175	5,000	96.62%	10,080	9,739	7,137	6,896
Total	842,581	376,751	NA	1,925,790	793,056	1,499,314	568,370

Table 1 above was derived by obtaining acreage information for each district through Chris Eacock at the Bureau of Reclamation (USBR) in Fresno. The number of acres requiring drainage by 2050 was taken from estimates in the San Luis Drainage Feature Evaluation, Plan Formulation Report, USBR, December, 2002 (pages 2-5 and 2-6). The maximum water savings associated with the retirement of these lands was calculated by multiplying the maximum contract amounts for each district by the percent of that district requiring drainage. Contract amounts were taken from a list of CVP contracts provided by Reclamation. Each district's total contract amount was calculated by adding all of its water contracts if more than one contract exists.

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Westlands gets subsidies 2002 over $100 mill

According to information we have received from the Environmental Working Group, water and crop subsidies to Westlands in 2002 amounted to over $100 million. If approximately half of Westlands, as well as those impacted lands in other drainage-problem districts such as Broadview, Widren, Mercy Springs, Panoche, Pacheco and others were retired, it would free up hundreds of thousands of acre-feet of water, as well as significantly reduce water and crop subsidies by tens of millions of dollars a year. Full analysis of such an alternative would provide meaningful disclosure to decision makers and the public about the true costs of delivering water to these problem lands.

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SWP

Table 2

	Total Irrigated croplands in 2002(acres)	Drainage Impaired acreage in 2000 (acres)	% of County Requiring Drainage Service	Estimated Contract Amounts (AF)	Estimated Water Savings (AF)
Tulare County	652,385	294,000	44.60%	1,304,770	581,927
Kern County	811,672	313,000	38.56%	1,623,344	625,961
Total	1,464,057	604,000	N/A	2,928,114	1,207,888

Table 2 above portrays a very preliminary estimate of water savings in Tulare and Kern County within the SWP service area. The acres of irrigated croplands in these Counties was taken from the USDA farm census statistics report in 2002. The acreage of drainage impaired acres is derived from a report by CA Dept of Water Resources, the 2000 San Joaquin Valley Drainage Monitoring Program. The acreages identified are for lands with high groundwater within 20 feet of the surface. The contract amounts were figured by estimating 2 acre-feet per acre irrigated, most likely an underestimated amount. Further investigation is needed to verify and refine these numbers, but clearly there is adequate justification to remove these lands from irrigation due to continuing drainage problems and salinization of land, in violation of Water Code Section 100-Wasteful and Unreasonable Use of Water.

Finally, the DEIS/R not only fails to suggest reasonable alternatives to the barriers project that would better solve the objectives of a real South Delta Improvement program-land retirement and less export, it also fails to evaluate the impacts of increasing the capacity to deliver export water to drainage impacted land.

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IV. The Selection of Alternatives Biases the Analysis, Predetermines Results and Fails to Achieve Identified Purposes of the Project.

The DEIS/R unreasonably narrows the project purposes to eliminate reasonable alternatives. The identified purposes of the project are defined as:

1. Reduce the movement of San Joaquin River watershed Central Valley fall/late fall-run juvenile Chinook salmon into the south Delta via Old River.

2. Maintain adequate water levels and, through improved circulation, water quality available for agricultural diversions in the south Delta, downstream of the head of Old River; and

3. Increase water delivery reliability for SWP and CVP water contractors south of the Delta and provide opportunities to convey water for fish and wildlife purposes by increasing the maximum permitted level of diversion through the existing gates at CCF to 8,500 cfs.

However, other than the no-project alternative, the only alternatives considered are construction of permanent barriers and increasing exports. This disingenuously predetermines the outcome and inappropriately excludes feasible less environmentally damaging alternatives. Arbitrarily excluding less environmentally damaging alternatives fails to meet the required scope of CEQA and NEPA.

In any case, project implementation will not meet the purposes of the project.

1. Construction of a Head-of-Old-River barrier may enable out-migrating salmonids to continue down the San Joaquin River rather than being drawn down Old River. However, DWR's particle tracking model and Vogel's radio-telemetry studies establish that San Joaquin out-migrants will subsequently be drawn down Turner and Columbia Cuts to the state and federal project pumps. Out-migrant salmonids still will not reach Chipps' Island.[2] Reducing the movement of salmonids into the south Delta via Old River accomplishes no environmental purpose if they escape Old River only to be drawn to the pumps via Turner and Columbia Cuts.

2. Likewise, project implementation will not improve water levels and water quality in the south Delta. As we discuss below, the DEIS/R acknowledges that water levels will decrease in the south Delta and any perceived improvement in water quality is speculative and lost in the noise of the modeling.

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[2] http://calwater.ca.gov/Programs/Conveyance/FTDDCCTDF/Sept15_2005/TDF_Presentation_Vogel_9-15-05.pdf ; http://science.calwater.ca.gov/pdf/2002_Salmonid_Workshop_Summary.pdf (page 37) ; Vogel D. 2001. Juvenile Chinook salmon radio-telemetry study in the northern Sacramento-San Joaquin Delta, January – February 2000. Final project report submitted to U.S. Fish and Wildlife Service, Stockton, Calif. Red Bluff (CA): Natural Resources Sciences, Inc. 32 p; and Vogel D. 2002. Juvenile Chinook salmon radio-telemetry study in the southern Sacramento-San Joaquin Delta, December 2000 – January 2001. Final report submitted to the U.S. Fish and Wildlife Service, Stockton, Calif. Red Bluff (CA): Natural Resources Sciences, Inc. 27 p.

3. The only project purpose that is potentially realized by project implementation is increased water exports. However, increasing exports is not likely to improve water supply reliability as DWR's Draft 2005 Reliability Report predicts that as water deliveries increase, reliability actually decreases. While the Reliability Report contains serious flaws that must be corrected, DWR has elected to use the report analysis as the method for determining project water supply reliability. The Reliability Report shows that the SWP is estimated to be capable of delivering 1.2 maf about 90% of the time under DWR's 2025 modeling while deliveries of around 3 maf are only reliable in less than 70% of years. The DEIS/R must analyze how increasing exports under the proposed alternatives affects the reliability curve of the SWP.

bad

V. The DEIS/R Fails To Provide An Adequate Discussion of the Project Setting and Therefore Fails to Properly Analyze SDIP impacts to Fisheries

"Accurate and complete information pertaining to the setting of the project and surrounding uses" is critical to an evaluation of a project's impact on the environment. *San Joaquin Raptor/Wildlife Center v. Stanislaus County* (1994) 27 Cal. App. 4th 713, 729; *See also Friends of the Eel River v. Sonoma County Water Agency* (2003) 108 Cal. App. 4th 859, 875 ("incomplete description of the Project's environmental setting fails to set the stage for a discussion of" significant effects). As detailed below, the DEIS/R does not provide a complete analysis of the current state of the Delta and therefore cannot adequately address the impacts of the SDIP on the environment.

Abundance indices calculated by the Interagency Ecological Program (IEP) suggest recent marked declines in numerous pelagic fishes and zooplankton in the upper San Francisco Estuary (the Delta and Suisun Bay). These low levels were unexpected given the relatively moderate hydrology over the past three years. IEP proposes to augment existing monitoring, perform new data analyses, and conduct special studies to investigate whether there is a new threat to pelagic fish and their prey, and if so, what has caused it.

The IEP conceptual model includes at least three general factors that may be acting individually or in concert to lower pelagic productivity: 1) toxins; 2) invasive species; and 3) water project operations. The overall approach adopted in 2005 is a screening-level study to better define the degree to which each of these factors may be responsible individually, in sequence, or in concert for the apparent step-changes. The workplan is based on a "triage" model to identify the most likely causes, and to assign priorities to projects on the basis of where funds and resources can be best used. Results also may shed additional light on causes of long-term declines in several of the affected species. Several of the lines of inquiry will be managed on an adaptive basis in that information will be examined as it is made available and depending on the results, increasingly focused studies will be conducted in 2006 and later years. SDIP needs to wait for the results of those studies before effective mitigations can be designed and implemented.

As noted, the abundance indices calculated by the IEP Fall Mid-water Trawl survey (MWT) show marked declines in numerous pelagic fishes in the upper San Francisco Estuary (the Delta and Suisun Bay). The abundance indices for 2002-2004 include record lows for delta smelt and age-0 striped bass and near record lows for longfin smelt and threadfin shad (Bryant and Souza 2004; Hieb et al. 2005). Data from another IEP monitoring survey, the Summer Tow Net Survey (TNS), support the MWT findings: TNS abundance indices for striped bass and delta smelt were among the lowest indices in the 45-yr record. In contrast, the San Francisco Bay Study did not show significant declines in its catches of marine/lower estuary species (Hieb et al. 2004; Hieb et al. 2005). Based on these findings, the problem appears to be limited to fish dependent on the upper estuary.

In addition to the declines in fish species, IEP monitoring also found declining abundance trends for zooplankton with a substantial drop in calanoid copepod abundance in 2004. Calanoid copepods such as *Eurytemora affinis* and *Pseudodiaptomus forbesi* are the primary food for larval pelagic fishes in the upper estuary (IEP 1987; Meng and Orsi 1991; Nobriga 2002) as well as older life stages of planktivorous species such as delta smelt (Lott 1998). Conversely, the invasive cyclopoid copepod *Limnoithona tetraspina*, which may be a poor food source for fish and an intraguild predator of calanoid copepods, is increasing in abundance and continues to be the most abundant copepod in the estuary (Mecum 2005).

While several of these declining species - including longfin smelt, juvenile striped bass and calanoid copepods have shown evidence of a long-term decline - there appears to have been a precipitous "step-change" to very low abundance during 2002-2004. This observation is supported by initial statistical analyses of the MWT data (Manley in prep.). Moreover, the record or near-record low abundance levels are remarkable in that the hydrological regime in the San Francisco Estuary was moderate during this period. Many estuarine organisms including longfin smelt and striped bass typically produce poor year classes in dry years (Jassby et al. 1995); delta smelt abundance is generally lowest in very wet or very dry years (Moyle et al. 1992). Thus, the moderate hydrology during the past three years should have supported at least modest production.

The fact that multiple pelagic species at more than one trophic level seem to show the 2002-2004 step decline is of particular concern. Regardless of whether the observations over the past three years are remarkable, the fact that the efforts of the California Bay-Delta Authority (CDBA) have apparently not arrested long-term declines in some pelagic species indicates that additional efforts are needed to identify what limits pelagic fisheries production in the upper estuary. Over the past decade, CBDA activities have resulted in a major shift in the timing of water exports, the development of an Environmental Water Account, and construction of habitat restoration projects. Additional information about the factors affecting pelagic organisms is needed before alternatives are designed for the SDIP, and provide guidance for future activities in the upper estuary including step 2 of SDIP.

Kimmerer (2002a) showed that water project operations have resulted in lower winter/spring inflow and higher summer inflow to the Delta. As noted previously, the CBDA actions have restored some spring inflow, but have also increased summer inflows to meet increasing summer export demands. This shift was implemented based on the assumption that it would be more protective to sensitive early life stages of key estuarine fishes and invertebrates. However, it is possible that high export during summer-winter months has unanticipated food web effects by exporting biomass that would otherwise support the estuarine food web. Other possible mechanisms include increased entrainment of fishes during the summer-winter months, or a reduction in habitat quality downstream (e.g. less area of the appropriate salinity). Total annual exports have continued to increase under the CBDA. It is also possible that the total volume diverted on an annual basis influences estuarine productivity (Livingston et al. 1997, Jassby et al 2002). The FEIR/S must disclose such information, analyze potential impacts from increased usage of pumping capacity in light of the uncertainties inherent in installation of permanent barriers and making operational changes to include further use of 8500 cfs export capacity.

We also suggest that you further evaluate impacts of SDIP in light of knowledge that in the past few years, more water has been exported during the summer (July-September) and the winter (December-March) than before, in part to compensate for conservation-driven export reductions in spring (April and May). There have been other changes in water project operation changes, which may also have had unexpected biological side-effects (e.g. export of more primary production). The purpose of ongoing scientific investigation is to closely examine recent changes in water project operations to identify effects potentially strong enough to account for the apparent step change in pelagic fish species abundances since 2001.

water project operations changes

Other historical changes in water project operations should also be disclosed and analyzed to support the decision-makers understanding of historical population dynamics for fish species in the Bay/Delta and to advance knowledge of the role of water project operations in the long-term decline of certain pelagic fish species. "Dramatic increases in winter CVP and SWP salvage occurred contemporaneously with recent declines in several pelagic fish species. These unexpected increases in salvage density coincide with the step decline pelagic fishes in 2002. The *Winter Adult Entrainment Hypothesis* presently being studied by the CALFED program posits that these events are causally linked. Evidence for this hypothesis includes:

1. There appears to have been a step increase in salvage density of adult delta smelt, threadfin shad and longfin smelt between 2001 and 2002. This increase is consistent with recent-year changes in winter water export operations. See Herbold et al

2. There appears to have been a step decrease in the Fall Mid-water Trawl indices of adult delta smelt, threadfin shad, and longfin smelt between 2001 and 2002. See Study Component 2i report by Manly and Chotkowski for details.

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3. Winter exports from the CVP and SWP have increased since the late 1990s. See Study Component 2h report by Simi and Ruhl for details.

Key

Increased winter entrainment of delta smelt, long-fin smelt and threadfin shad represents a loss of the pre-spawning adults and all potential progeny. This means on a per capita basis loss of each adult fish may be equivalent to the loss of hundreds or even thousands of juveniles later in the year. Because an entrainment impact specifically affecting adult fishes has the potential to be strong, we regard finding an explanation for this coincidence a high priority.

The main sorts of explanations for why winter salvage densities may have increased since 2002 include: (1) the source of exported water has been changed to an area where more of these fishes occur during the winter; (2) the affected fishes have moved to areas from which exports are drawn; and/or 3) winter exports have increased past some sort of hydrodynamic threshold below which fish were better able to avoid entrainment. We expect well-documented answers in the FEIS/R to questions like: How have recent (1995 – 2004) water project operations policy changes changed delta hydrology? "Hydrology" is meant here to include the volume, timing, and pattern of input flows into the delta, delta outflow, exports, and operation of various water project gates and barriers. We also ask: which, if any, of the changes might plausibly have contributed to, or caused, a step change decrease in pelagic fishes abundance since 2001? We also want to know how the barriers will effect the questions above.

Very good

We suggest that you redo the DEIR/S to adopt the following assumptions for your new analysis since the on-going IEP study is using them:

1. Stressor effects on pelagic populations are highest during the summer period.
2. Ideal" hydrology in 2005 will not result in substantial increases in the abundance of pelagic fish and calanoid copepods.
3. Stressor effects have increased during the summer period relative to historical data.

We further suggest that you redo the inadequate analysis in the DEIS/R of the potential for the SDIP to aggravate the unfolding pelagic fish crash. A thorough analysis of the direct and indirect effects of building the barriers on reverse flows, water levels, entrainment of salmon and smelt, predation, residence time of water in the South Delta, and hydrodynamic changes in the South Delta caused by the new permanent barriers should be prepared. The analysis that presently exists in the DEIS/R is not adequate to justify selection of any of the alternatives presented and will result in misleading the decision-makers about the environmental impacts of the project and what course to take in their respective decision documents.

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VI. The DEIS/R Fails to Adequately Analyze Project Impacts.

An EIR must provide information about the magnitude and type of environmental impacts; it may not, as this draft does, simply speculate that there may be impacts and hope for the best. *See Stanislaus Natural Heritage Project v. County of Stanislaus* (1996) 48 Cal. App. 4th 182, 196-97. An EIR must also provide "information about how adverse the adverse impact will be." *Santiago County Water District v. County of Orange* (1981) 118 Cal. App. 3d 818, 831. This information must contain facts and analysis, not the agency's bare conclusions . . . ") *See Citizens of Goleta Valley*, 52 Cal. 3d at 568.

As detailed below, the DEIS/R fails to provide an adequate analysis of a range of project impacts. This failure renders the DEIS/R inadequate and requires that the DEIS/R be revised and recirculated prior to project approval.

1. Water Quality Impacts from SDIP were inadequately disclosed and considered in the DEIS/R.

The analysis of water quality impacts in the DEIS/R is woefully inadequate. The SDIP must be consistent with and comply with requirements of the federal Water Pollution Control Act and California's Porter-Cologne Water Quality Control Act. Delta water quality must not be sacrificed at the altar of increased exports. The historical export of South Delta water has fundamentally altered the movement of pollutants throughout the Delta. Rapid population growth in the South Delta is increasing the mass loading of numerous pollutants (i.e., wastewater, stormwater, illegal dumping). Implementation of the SDIP will further alter the distribution and concentration of these constituents. The majority of water quality monitoring has primarily focused on salinity, with little emphasis on other water quality parameters. Sufficient baseline field data does not yet exist to adequately calibrate/verify models and evaluate project effects on the rainbow of water quality constituents (i.e., virtually the entire suite of organic and inorganic pollutants) that will likely be affected by the project. A rigorous water quality analysis should precede project evaluation, alternative formulation, and implementation.

As previously noted, attached and included as a part of these comments is the assessment titled *Comments on the Draft Environmental Impact Statement Environmental Impact Report, South Delta Improvement Program* by Dr. G. Fred Lee and Dr. Anne Jones-Lee on the fundamental inadequacy of the DEIS/R's analysis of the project's potential adverse impacts to water quality. (Attachment 1)

The DEIS/R failed to address our scoping comments for this project with respect to water quality issues. It does, however, acknowledge that the project will require a Clean Water Act § 401 Certification. Regardless or whether our concerns are adequately addressed in this environmental review, DWR and BOR cannot avoid addressing these issues in what is likely to be a highly contested certification process.

The Delta is identified on the California Clean Water Act 303(d) List as impaired because of diazinon, chlorpyrifos, DDT, Group A Pesticides, electrical conductivity, mercury, organic enrichment/low dissolved oxygen and unknown toxicity. Old and Middle Rivers

are listed as impaired because of low dissolved oxygen. The DEIS/R acknowledges that changes in hydrology can affect fate and transport of pollutants. It also acknowledges that synthetic and natural contaminants have bioaccumulated in Delta fish and other aquatic organisms and that synthetic organic chemicals and heavy metals are found in Delta fish in quantities exceeding acceptable standards for food consumption. Inexplicably, the DEIS/R fails to address the project's effects on the full suite of pollutants presently identified as impairing Delta waters, with the exception of salt. The DEIS/R cannot simply evaluate project impacts in terms of a "conservative" constituent like salt or impacts to dissolved oxygen in the Stockton deep-water channel. It must analyze and quantify the Project's effects on toxicity and impairing constituents in the south Delta and propose mitigation, so that the public and decision makers may reach their own conclusions about the adverse impacts of the project. *Save Our Peninsula v. County of Monterey* (2001) 87 Cal. App. 4th 99, 130. *See Citizens to Preserve the Ojai v. County of Ventura* (1986) 176 Cal. App. 3d 421, 432-33 (finding "an absolute failure to comply [with CEQA]" where information relevant to project's impacts was omitted).

Toxicity to lower tropic populations in Paradise Cut, attributable to organophosphorus insecticides, extends for weeks at a time. Delta waters frequently contain a cocktail of as many as 15 pesticides. Many of these interact additively or synergistically and/or bind to sediment. The tissue of fish collected from the South Delta contains high concentrations of bioaccumulative toxins (i.e., legacy pesticides, mercury and PCBs). Changes in south Delta hydrology will inevitability affect the fate and transport of these toxic constituents. The DEIS/R must be revised to include a characterization and assessment of the sources, mass loading and fate and transport of all pollutants likely to be present in south Delta channels and an evaluation of water quality impacts from the project and alternatives.

There are indications that selenium loads in the San Joaquin River have historically been diverted down Old River. Benthic organisms bio-accumulate selenium. The EIR/EIS should evaluate the effects of redirected selenium loads into the eutrophic areas of the Central Delta.

Dioxin concentrations significantly above levels protective of public health have been documented throughout San Francisco Bay and the Stockton Deep-Water Channel. Discussion with staff from the California Department of Public Health and the Central Valley Regional Water Quality Control Board, as well as private consultants, lead CSPA to believe that elevated concentrations of dioxins are likely present in the South Delta. The SDIP should evaluate the project's effects on likely dioxin concentrations in the South Delta.

Elevated levels of pathogens have been identified in the South Delta. Changes in flow will likely have an effect on concentration and spatial distribution of bacteria, viruses and parasites. Consequently, the DEIS/R must identify and evaluate the project's effects on pathogens.

The project's permanent barriers and inevitable changes in hydrology and export rates will likely have a significant effect on existing efforts to achieve water quality standards.

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The DEIS/R must discuss the project's compatibility with TMDLs, Toxic Hot Spot Cleanup Plans, NPDES permitting for increased contaminate loading and Basin Water Quality Control Plans. It must also discuss how altered flow and increased exports will effect implementation of control measures.

Increased exports will likely alter streamflow regimes on major tributaries to the Delta (including the Trinity and Klamath Rivers). The DEIS/R must more completely evaluate and discuss the project's effects on the physical and chemical parameters necessary to support renewable fisheries within upstream tributaries and reservoirs.

Increased exports during certain periods of the year will likely lead to reductions in streamflow during other times of the year (as the VAMP did on the San Joaquin River). This will almost certainly lead to a reduction in assimilative capacity (i.e., reduction in available dilution) on a number of Bay/Delta tributary rivers during certain time-periods. Reduction in streamflow and the resulting loss of assimilative capacity could necessitate more stringent NPDES permit limits. More restrictive permit limits will require dischargers to expend enormous sums of money to comply with new limits. The DEIS/R must evaluate the impacts to dischargers who will face more stringent permit limits caused by reductions in available dilution. Class water present -

A significant SDIP component involves increased dredging of south Delta channels. Recently, the Central Valley Regional Water Quality Control Board strengthened requirements for dredging and dredge spoil placement. A comprehensive assessment of contaminate remobilization from dredging activities and potential effects of land disposal on terrestrial organisms is required. The discussion must include an evaluation of the adequacy of available sediment analyses (i.e., number of core samples, locations, constituents analyzed, concentrations, detection limits, etc.) and identify and evaluate disposal sites.

Lastly, we note that State Water Resource Control Board Revised Water Rights Decision 1641 changes the salinity standard for south Delta channels from 0.7 mmhos/cm (April through August) to 1.0 mmhos/cm upon implementation of the permanent barriers. This degradation of water quality represents a significant adverse environmental impact. The DEIS/R is deficient for not discussing and mitigating this degradation of water quality on south Delta agriculture.

2. The Analysis of Upstream Fisheries Impacts Caused by SDIP Is Inadequate.

The SDIP DEIS/EIR contains unsubstantiated findings about the lack of impacts to Central Valley fisheries. Spring chinook, fall Chinook and steelhead spawn, migrate and hold during periods when temperatures can be an issue in the summer and early fall. The same is true for pelagic species in the Delta. The DEIS/R fails to recognize the importance of steelhead and Chinook in sport, tribal and commercial harvest, and it fails to identify that lower upstream carryover storage will have a negative impact on the survival of Central Valley fisheries below major dams. The DEIS/R completely ignores

the issue of cold water reserves that are required in upstream reservoirs to ensure that adequate stream temperatures can be achieved in the dry periods and parts of each year (summer) in which cold water is most necessary for species survival.

Presumably, increased export rates could lead to drawdown of upstream reservoirs. Should the SDIP lead to reductions in upstream reservoir storage and water elevation, the effects on fisheries and recreation in the affected impoundments requires a much more complete analysis than has been done in the DEIS/R. It should also discuss potential effects to non-state water project facilities and water rights holders (i.e., those having to meet shortfalls induced by the SDIP).

very imp!

The DEIS/R should be revised to include a full analysis of impacts to Central Valley River temperatures from the SDIP-OCAP project and of each alternative's likely consistency with State and federal water quality standards and objectives. The DEIS/R revision should evaluate project compliance with all Delta water quality standards, including the .7 EC standard at interior Delta locations as required by D-1641.

The BOR has previously recognized the need to lower Delta export as a result of a decision limiting diversions from the Trinity to the Sacramento/Delta system. The 2000 Trinity River Record of Decision (ROD) called for increased fishery flows into the Trinity River from Trinity and Lewiston Dams, corresponding to roughly a 1/1 reduction in water exports to the Sacramento River. It is now apparent that the BOR, through the SDIP, has no intention whatsoever of honoring its requirement to reduce water exports to the CVP commensurate with the increase in Trinity River fishery flows. Instead, BOR intends to continue historic deliveries of CVP water from the Delta, as indicated by the numerous CVP long-term contracts such as the San Luis Unit that promise larger future deliveries.

Therefore, approval of the SDIP and implementation of the Joint Point of Diversion whereby the CVP can send its "surplus" water south of the Delta using SWP pumping capacity will surely result in depleted cold water reserves in all upstream Reservoirs at the beginning of the next multi-year drought. The DEIS/R should identify the source of water for increased SDIP exports and disclose and evaluate environmental impacts in the source areas. Whose water are they exporting in this project anyway?

recent Bay Delta decision applies here

3. The DEIS/R Fails to Acknowledge, Address and Mitigate Project Impacts to the Tracy Fish Facility.

The DEIS/R ignores the effects of barrier operation in conjunction with accelerated export pumping on Central Valley Project export facilities. While DWR's pumping facility draws water from Clifton Court Forebay, the BOR relies upon the Old River tidal pool for its water supply. Implementation of the temporary barriers and increased export pumping have caused water stage height in Old River to decline causing head loss at the BOR pumps, especially during low tides. The Tracy Fish Facility is no longer able to operate within design criteria in accordance with the Biological Opinion and export pumping costs have increased. Moving the Grantline Canal barrier further downstream

will further constrict BOR's tidal pool. The proposed project will exacerbate these problems by causing further and longer reductions in stage height, reduced fish salvage effectiveness, greater turbulence and increased electricity costs.

The south Delta has lost 4-5 feet in stage height since the 1950's. BOR staff has suggested that as much as an additional 4 feet head loss could occur in the coming years from implementation of the Intertie (1.5 foot loss), Banks 8,500 cfs (1 foot loss) and Banks 10,200 (1.5 foot loss).

Temporary barriers and increased pumping have reduced primary and secondary channel and holding tank velocities and secondary bypass ratios are now below one. Turbulence has increased. The primary channel was designed to operate at a 16-21 foot depth but now operates at 13-19 foot depth. The secondary channel was designed to operate at a 5-10 foot depth but presently operates at a 0.5-8 foot depth. The holding tank was designed to operate at a minimum depth of 5 feet but now operates at a minimum depth of 0.5 feet. Fish salvage effectiveness has been reduced from design criteria (80-90% in the 1960's) to 50-60% (early 1990's) to less than 20% today. Improving TFCF Hydraulics, Lloyd Hess, Attachment 2.

BOR project pumps are 3 feet lower than DWR's export pumps. Operation of permanent barriers will:

a. Reduce the volume of water available to BOR at low tides.
b. Will cause longer low tides.
c. Increase debris buildup on trash racks.
d. Increase power costs from having to raise water from a lower elevation.
e. Further decrease the efficiency of salvage operations.
f. Increase sedimentation in Old River adjacent to BOR's facility.

The DEIS/R must be withdrawn and revised to analyze and discuss the project's adverse impacts to the BOR facility.

4. The DEIS/R Fails to Adequately Analyze and Mitigate Impacts from New and/or Modified Irrigation Diversions.

Since the project will lower water levels in the south Delta during periods of high export pumping, the project proposes to extend 24 agricultural intakes and install more powerful pumps to facilitate irrigation. These new pumps will replace less powerful pumps or, in many cases, existing siphons and are more likely to entrain fish. However, these new pump intakes will not be screened in violation of California Department of Fish and Game and NOAA Fisheries fish screen policies. This despite clear evidence from DWR's Particle Tracking Model that these diversions are a cause for fish loss in the south Delta. The DEIS/R is deficient for not analyzing and mitigating increased entrainment.

5. The DEIS/R's Analysis and Explanation of the Project's Effects on South Delta Water Circulation and Water Quality is Deficient.

One of the three identified project purposes is to "[m]aintain adequate water levels and, through increased circulation, water quality available for agricultural diversions in the south Delta, downstream of the head of Old River." The DEIS/R describes the modified circulation pattern as:

a. During high tides the three gates will be lowered to allow water to flow upstream. The gates will be raised prior to the following ebb tides to ensure adequate water level remains behind the gates.

b. The height of the Grantline Canal barrier will be lower than the Old River and Middle River barriers and this will ensure that water will flow from Old and Middle River into Grantline Canal to exit over the Grantline barrier.

The Summary of Environmental Effect (Chapter 4, page 4.4) states that construction and operation of permanent gates would not result in any significant reductions in south Delta channel tidal level. This begs the question of what is significant. For example, Figure 4.1 (Minimum and Maximum Tidal Level for Grant Line Canal at Tracy Boulevard Bridge for Each Alternative) reveals that installation of permanent barriers would reduce the tidal level about 0.5 feet (maximum tide) and up to 1.0 feet (minimum tide). Examination of DSM-2 validation (Appendix D-24 – D-26) reveals that model simulations of tidal elevations in south Delta waterways are 0.5 foot to 1.0 foot higher than measured tidal elevations. Clearly, replacement of the temporary barriers with permanent barriers results in lower water elevation in the south Delta.

The DEIS/R doesn't include DSM-2 validation for salinity (EC) for interior south Delta stations. However, DWR's web sit does contain comparisons between current calibration and observed EC levels for interior south Delta stations. http://modeling.water.ca.gov/delta/studies/validation2000/map.html. Both 14-Day Moving Averages and 24.75 Hour Running Averages show substantial differences between simulated and observed EC levels. For example, simulated EC at Old River at Tracy Boulevard is often more than 1,000 μS/cm lower than field observation. Any representation regarding improved EC in the south Delta resulting from implementation of permanent barriers must be taken with a grain of salt. The DEIS/R must be revised to adequately discuss the potential errors in modeling and the relative probabilities of increased circulation, water levels and water quality.

using modeling to

The modeling fails to account for resistance in the upper reaches of Old and Middle Rivers, especially during the two low tide cycles each month. As tidal flow pushes upstream, it encounters greater resistance until the net flow disappears and a null zone develops. Resistance can also be increased as channel geometry changes (i.e., increases in sedimentation or formation of sandbars). DWR modeling relies upon old data and, consequently, it is unlikely that the simulations accurately reflect current conditions. It also incorporates an assumed average salinity concentration for local agricultural

discharges despite the fact that central Delta farmers discharge lower levels of salt than south Delta farmers. This has the effect of understating the salinity in return flows and the resulting salinity concentrations in south Delta channels. Further DSM-2 treats waterways as boxes and a comparison of actual channel dimensions with modeled dimensions reveals substantial differences, often as much as 20-25% (personal conversation, Jeff Stuart, NOAA Fisheries). These effects are likely to be exacerbated as agricultural diversions remove water from the channels. It is possible that, under these conditions, there would be no net flow down Grantline Canal. Indeed, considering that the modeling of agricultural diversion is based upon 30-day averages (and farmers don't irrigated on 30-day averages), it is likely that actual agricultural diversions would lead to channel depiction causing reverse flows down Old and Middle Rivers for significant periods. The DEIS/R must be revised to provide a candid in-depth discussion of how circulation will be assured under the project.

There have been several suggestions that the use of low lift pumps would help ameliorate problems cause by lack of circulation. We note that Volume 1, Page 2-23, Gate Design and Construction Detail states that "[p]er a developing agreement with south Delta water users, three agricultural gates may include structural and wiring features that would allow the easy addition of low head pumps and piping, should this contingency prove necessary and appropriate in the future." However, this would raise problems of its own and is clearly outside the scope of the described project. As such, implementation of these structural and wiring features would represent an illegal commitment of resources in violation of CEQA.

Another problem largely ignored in the DEIS/R is that reductions in San Joaquin River flow through the HOR barrier will make it more problematic for farmers along Tom Paine Slough, Paradise Cut and below the HOR barrier to irrigate. Even a brief loss of suction to a siphon would represent significant trouble and cost to a farmer. The description of potential impacts to Tom Paine Slough, Paradise Cut and upper Old River is seriously deficient and must be revised.

Nor does the DEIS/R adequately discuss the quality of agricultural discharges and return flows and discharges of stormwater and wastewater from municipalities. Considering the rapid growth and increased pollutant loading from Tracy, Mountain House and adjacent communities, it is likely that water quality problems will be exacerbated during periods of low flow or stagnation. The DEIS/R must analyze the effects of these pollutant inputs on water quality.

6. The DEIS/R Ignores Impacts to Aquatic Life from Construction and Operation of Permanent Barriers.

Although DFG trawls are no longer conducted in south Delta channels, these waterways once provided good habitat for Delta smelt. Oddly, there is no analysis of the impacts to aquatic life, including Delta smelt, in south Delta channels although the construction and operation of the permanent barriers and other structural components are likely to have

adverse impacts. The DEIS/R must be revised to include a rigorous discussion of potential impacts to all life stages of all aquatic life in these waterways.

7. The DEIS/R Fails to Analyze the Impacts of Increased Winter Pumping on Delta Smelt.

As previously noted, the decline of pelagic species in the Delta has occurred during periods of increased export pumping and operation of the EWC. In fact, IEP studies have suggested that increased winter pumping is a contributing factor to recent declines of Delta smelt. Since the DEIR/S relies upon EWC, it must analyze and mitigate for adverse impacts to Delta smelt and other species caused by increase EWC winter pumping.

8. The DEIS/R Fails to Analyze Redirected Impacts from SDIP.

The scoping document for the SDIP identified the primary issues as: 1) current and proposed diversion rates impede the ability to divert irrigation water, 2) salinity standards, and 3) decline in Delta smelt and San Joaquin River salmon populations. The project's elements are defined as: 1) increased maximum export capacity at Clifton Court Forebay, 2) dredging in Old River to facilitate increased exports, 3) improved agricultural water delivery by construction of permanent operable barriers and local channel dredging, and 4) construction of a fish control structure at the head of Old River to reduce salmon losses at CVP and SWP export facilities.

However, increased export rates, the potential for increases in total export quantity and the inevitable altered hydrographs on numerous tributaries are likely to affect the entire Central Valley circulatory system. Many of the Delta's present problems derive from a failure to consider the redirected or system-wide impacts caused by previous projects. The DEIS/R must reevaluate the project's potential present and future redirected adverse impacts on: 1) the suite of water quality problems and pollutants in the Delta, downstream waters (Suisun and San Francisco Bays) and upstream tributaries (including the Trinity-Klamath system), 2) aquatic life populations in those waterbodies and 3) existing programs to meet water quality standards (i.e., TMDLs, Toxic Hot Spot cleanup programs, NPDES permits, etc.).

VII. The DEIS/R Fails to Adequately Analyze Cumulative Impacts Caused by the SDIP and Other On-going State and Federal Programs.

NEPA does not allow projects to be analyzed in artificial isolation. Instead, it requires discussion, in an EA or EIS, of the cumulative impacts of the proposed project in combination with "past, present, and reasonably foreseeable future actions." 40 C.F.R. § 1508.7; *see Native Ecosystems Council v. Dombeck*, 304 F.3d 886, 895-96 (9th Cir. 2002). That discussion cannot be "perfunctory," *Kern v. United States BLM*, 284 F.3d 1062, 1075 (9th Cir. 2002), but instead must provide "some quantified or detailed information; ... general statements about 'possible' effects and 'some risk' do not constitute a 'hard look' absent a justification regarding why more definitive information

← CEQA as well I believe

could not be provided." *Id.* (quoting *Neighbors of Cuddy Mt. v. United States Forest Serv.*, 137 F.3d 1372, 1379-80 (9th Cir. 1998)). See also *Muckleshoot Indian Tribe v. United States Forest Serv.*, 177 F.3d 800, 811-12 (9th Cir. 1999); *City of Carmel-by-the-Sea v. United States DOT*, 123 F.3d 1142, 1161 (9th Cir.1997); *LaFlamme v. FERC*, 852 F.2d 389, 401-02 (9th Cir. 1988). CEQA similarly requires lead agencies to consider cumulative impacts, or the incremental effects of the proposed project viewed together with the effects of past, current, and probable future projects. Pub. Resources Code § 21083(b); CEQA Guidelines § 15130(a)-(b).

yes

A cumulative impacts analysis must address "reasonably foreseeable" projects that may have a "synergistic environmental effect" combined with the project under review. *Tenakee Springs*, 915 F.2d at 1312-13. A project is "reasonably foreseeable" when formally proposed by government agencies. *Kern*, 284 F.3d at 1075-78; *Muckleshoot Indian Tribe*, 177 F.3d at 811-12. The state and federal government are required to evaluate their SDIP project in context of the numerous other projects presently contemplated during the thirty-year CalFed program.

Such analysis was particularly necessary here, for the SDIP is a component of a larger set of interrelated actions in the CALFED program, many of which involve sustaining damaging level of exports or increasing extraction of water from the Bay-Delta. In their CALFED programmatic FEIS/EIR, the Bureau and DWR described the SDIP project as part of a broader effort to increase water supply, and the CALFED agencies "recognized that many of their proposed actions were interrelated." BOR EA/IS for the Intertie, at 3-86. Likewise, in the OCAP ESA consultation process, the Bureau, FWS, and NMFS defined the SDIP, along with several other changes to CVP and SWP operations, as part of the same overall OCAP project. Cumulative impacts discussions cannot merely provide "general statements about possible effects." *Kern*, 284 F.3d at 1075; *see Neighbors of Cuddy Mt.*, 137 F.3d at 1379-80. Yet the SDIP DEIS/R cumulative impacts discussion contains only generalities and unsupported conclusions in violation of both CEQA and NEPA.

great!

yes

Even if it had prepared the cumulative impacts analysis NEPA requires, the Bureau and DWR could not have explained their deviation from the earlier CALFED EIS/EIR's conclusions, for those conclusions were right. As the CALFED EIS/EIR explained, the SDIP and related projects also designed to sustain or increase exports have significant potential impacts:

1. Export pumping causes "negative" flows, in which water flows toward the south Delta pumps rather than San Francisco Bay, for many months each year. Those "[r]everse flows…have contributed to the reduction of Bay-Delta productivity and of some Bay-Delta invertebrate and fish populations." *Id.* at 6.1-8, 6.1-42 (listing affected species, many of which are threatened or endangered);

2. Export pumping pulls saline water into the Delta. "Sea-water intrusion into the Delta can be intensified by diversion of fresh water and the corresponding decrease of freshwater outflow from the Delta" *Id.* at 5.2-5;

3. Export pumping causes "salinity [that] adversely affects most beneficial uses. Bromides associated with sea water lead to the formation of DBPs in treated water." *Id.* at 5.3-11. Salinity intrusion also forces open water species that prefer non-saline habitat to move from Suisun Bay, which provides open-water habitat, into the Delta, which does not. *Id.*; *see id.* at 6.1-35 (explaining benefits of minimizing saline intrusion);

4. Export pumping kills thousands of fish. Those fish die through "direct loss at pumps, reduced survival when young fish are drawn out of river channels into the Delta, and reduced spawning success of adults when migratory cues are altered." Therefore, "most species are potentially affected" by pumping increases, "including chinook salmon, delta smelt, steelhead, and striped bass"—all of which are protected under federal law;

5. Export pumping for irrigating the west side of the San Joaquin Valley, where SDIP water will be transported, drains pollutants into the San Joaquin River and the Bay-Delta. *Id.* at 5.3-7. The CALFED Program EIS/R recognized that "Inadequate natural drainage, salt accumulation, and high selenium concentrations in agricultural return flow have been long-standing problems in this area and have intensified with the importation of irrigation water from the Delta." *Id.* at 6.1-11; and,

our Bay Delta case

6. Export pumping threatens compliance with federal and state law, both of which require attaining water quality objectives and recovering endangered species populations. CALFED specifically acknowledged that "[t]here is concern whether a through-Delta conveyance approach," in which water is sucked through the Bay-Delta by the South Delta pumps, "can meet future water quality objectives and not adversely affect the recovery of threatened and endangered fish species." *Id.* at ES-17.

The CALFED EIR analysis confirms a common-sense notion: increasing the already-massive amount of water pumped out of a fragile aquatic ecosystem, at a time when other export-increasing projects are proposed, fish populations in that ecosystem are threatened or collapsing, and water quality already fails to meet federal and state standards, is likely to cause adverse environmental impacts. The SDIP DEIS/R's contrary conclusion is arbitrary and unreasonable given the historical facts in the Bay/Delta.

Further, the DEIS/R fails to identify and analyze a number of other existing and proposed projects that will have synergistic environmental impacts. Consequently, the DEIS/R is deficient, and should be withdrawn and revised to address and analyze these projects.

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1. **South Delta Temporary Barriers Project.** The DEIS/R begins with the clear assumption, that project effects from the Temporary Barriers project are part of the "baseline." As such they are not to be considered impacts of this project. However, a careful review of the environmental documentation for the Temporary Barriers project clearly identifies areas of concern that were to be studied. Examples include the effects of inundation of listed plants (such as the Mason's lileaopsis), by the operation of the barriers, and the accumulation of avian and fish predators at the barrier sites. These impacts have occurred and are the responsibility of the Temporary Barrier's Project to mitigate. Since the SDIP will replace the Temporary Barrier's Project, it becomes the responsibility of the SDIP to mitigate for these impacts.

2. **City of Stockton Drinking Water Intake.** The City of Stockton is planning to construct an intake on the San Joaquin River near Potato Slough. The environmental documents for the project acknowledge entrainment and reduction of Delta outflow issues.

SDIP, Intertie, Peripheral Canal + increase exports

3. **Delta Improvement Project (DIP).** This CalFed program includes the SDIP, the Delta Cross-channel re-operation, the Through Delta Facility, the Frank's Tract modification, the Contra Costa Water District facilities, and the increases in export capability.

4. **CVP-SWP Intertie.** A connection between the CVP's Delta Mendota Canal and the SWP's California Aqueduct, which will permit 300 cfs to be pumped from the CVP to the SWP, and will allow up to 900 cfs to flow from the SWP to the CVP.

5. **Joint Point of Diversion and Coordinated Operating Agreement.** This item is currently before the SWRCB who is currently conducting a Cease and Desist Order hearing on the subject of violations of internal Delta water quality standards by the CVP and SWP.

yes

6. **Port of Stockton Water Quality Improvement Project.** This project proposes to inject oxygen into the zone of low DO in an effort to improve the water quality. Injection of pure oxygen into the water column is likely to create super saturated conditions detrimental to fish.

7. **San Joaquin River Recirculation** – This proposed recirculation program would move Delta water south, via the Delta-Mendota Canal, to the Newman Wasteway for release into the San Joaquin River.

NEPA also does not allow project to be analyzed in artificial isolation. Instead, it requires discussion of the cumulative impacts of the proposed project in combination with "past, present and reasonably foreseeable future actions." The past direct and indirect impacts to the aquatic habitat, ecology and fishery populations from state and

federal project operations (including temporary barriers) have resulted in long-term cumulative adverse effects on present and future generations of aquatic life in the Delta. The DEIS/R is deficient for not candidly discussing project impacts on population trends for striped bass, sturgeon, American shad, Delta and long-fin smelt and other Delta species, including their food webs. Such an evaluation would encompass entrainment of all species of fish and lower tropic populations and provide an assessment of what cumulative impacts have occurred over the life of the projects and what can reasonably be expected to occur if the proposed project goes forward.

VIII. The DEIS/R Improperly Relies on DSM-2 and CALSIM II, Flawed Analytical Tools that Fail to Adequately disclose the SDIP's Environmental Impacts.

The DEIS/R's analyses of water availability, environmental impacts, export and project effectiveness are predicated almost entirely on modeling output. While DSM-2 and CalSim-II may be useful tools, a complete dependence upon modeling is inappropriate as the models are incapable of providing the certainty that is required of an environmental document. Yet, throughout the DEIR/S, modeled predictions are presented as fact. There are no error bars that would indicate the range of uncertainty or accuracy (although the DEIS/R briefly admits that modeled surface elevations in the south Delta tend to be half a foot higher than actual levels). It is simply inappropriate to base major planning decisions on modeling output without discussing model resolution and probabilistic error rates.

DSM-2 has never been peer reviewed and been heavily criticized. It's 2001 calibration and verification report has never been finalized and remains in an incomplete draft form. For example, DSM-2's salinity transport module is one-dimensional and has been calibrated exclusively using surface salinity. It ignores stratification and assumes that surface salinity over a channel cross-section is constant. Only a three-dimensional model can account for higher concentrations of salinity at depth, as has been documented by subsurface monitoring. Examination of the most recent verification of DSM-2 water quality modeling reveals substantial differences between actual and predicted values. For example, as previously discussed, salinity at Old River at Tracy Road 14 Day Moving Averages and 24.75 Hour Running Average Plots: 1 April 1900 through 30 September 1994 and 1 October 1994 through 30 September 1999 show substantial discrepancies; often more than 1,000 µS/cm. http://modeling.water.ca.gov/delta/studies/validation2000/qual-ec/rold059Avg.html. It is clear that any claimed improvement from the project implementation is lost within the "noise" of the model. Consequently, proponent claims that the project will improve electric conductivity by a precise amount are without creditable foundation.

CALSIM II modeling is similarly flawed. CalSim II is not an accurate model design to evaluate environmental impacts of the SDIP-OCAP and it has not been sufficiently calibrated for this use. DWR and BOR have been told this by other scientists repeatedly. CalSim-II is being used in every significant water planning process now underway in California. When the outcome of a planning process like this one hinges on modeling

results, even partially, the assumptions and assertions that lead to these results should be accurate and transparent. Indeed, the failure to utilize an accurate model to assess the environmental impacts renders the DEIS/R's analysis inadequate. *See Berkeley Keep Jets Over the Bay v. Board of Port Commissioners,* 91 Cal. App. 4th 1344 (2001) (finding that agency improperly relied on outdated air quality model to assess the impact of toxic air contaminants.)

Given the paucity of available empirical water quality data, evaluations of project impacts on water quality and flow are dependent upon flow and water quality modeling efforts. However, hydrodynamic modeling by any known technique is not an exact science. Models are easily manipulated and should not be employed as substitute for hard data or common sense. Subtle changes in coefficients or assumptions can dramatically alter output. Input variables are critical. Proper calibration and verification is crucial. Even then, models are only an idealization of actual field conditions and must be used with caution to ensure that underlying assumptions hold for the site-specific situation being modeled. For example, the DEIS/R's assumption that future water flow patterns will be similar to those that have occurred in the past is clearly inconsistent with the body of literature on the effects of global warming on California water flows. The use of average values in modeling ensures results that are generally unprotective of specific water quality criteria. Virtually all models, even those subject to peer-review, have significant rates-of-error, often greater than plus or minus 50%.

The DEIS/R fails to identify and discuss:

1. Model input variables; i.e., channel geometry, surface and bottom temperature and density, constituent concentration, velocity, friction factors, stratification, etc.
2. Calibration and verification of models; i.e., adequacy of baseline data for various constituents and how closely output conforms to actual field measurement.
3. Assumptions used in modeling flow and water quality. For example, CalSim II studies for the SDIP have assumed that Stanislaus River operations are in accordance with the USBR's New Melones' Interim Operation Plan. However, since the Interim Operation Plan cannot be met during drought cycles, the model cannot accommodate the lack of New Melones' storage and reduced instream flow during consecutive drought years.
4. Foreseeable future changes: i.e., loss of storage capacity due to sedimentation and the continuing 80 year decline in snowmelt as a percentage of yearly runoff.

The independent peer-review report titled *A Strategic Review of CALSIM II and its Use for Water Planning, Management, and Operations in Central California* that was submitted to the California Bay Delta Authority Science Program in December 2003 documented numerous problems with the model. (Attachment 6) The report stated that "[I]n our opinion CalSim II has not yet been calibrated or validated for making absolute predictions values. Report at 6.1, absolute Values or Comparative Results. It further stated that the panel is skeptical of the suggestion that, while the model might not

generate a highly reliable absolute prediction because of errors in model specification and /or estimation, it might produce a reasonably reliable estimate of the relative change in outcome.

Among the many weaknesses noted by the peer-review panel are:

1. The model is too complex and did not handle particular components of the system with sufficient detail.
2. The modelprovides limited and inadequate coverage of non CVP or SWP water and of the California water system south of the Delta.
3. The model assumes that facilities, land-use, water supply contracts and regulatory requirements are constant over this period, representing a fixed level of development rather than one that varies in response to hydrologic conditions or changes over time.
4. Groundwater has only limited representation in CalSim II.
5. Groundwater resources are assumed infinite, i.e., there is no upper limit to groundwater pumping.
6. The linear programming model considers only the current month, and hence CalSim II operating rules are required to determine annual water allocations, to establish reservoir carryover storage targets, and to trigger transfers from north of Delta to south of Delta storage.
7. Better quality control is needed both for the model and its current version and input data. Procedures for model calibration and verification are also needed. Currently many users are not sure of the accuracy of the results. A sensitivity and uncertainty prediction capability and analysis is needed.
8. Need improved ways of altering the model's geographic scope and resolution and its temporal resolution to better meet the needs of various analyses and studies.
9. Need to improve the model's comparative as well as absolute (or predictive) capabilities.
10. CalSim II needs better capabilities for analyzing economic, water quality, and groundwater issues.
11. Need improved documentation explaining how the model works, its assumptions, its limitation, and its applicability to various planning and management issues.
12. DWR and USBR have not provided a centralized source of support for CalSim II. More training for CalSim II is needed. There is a need for more people who can run CalSim II. There is a need for a well-publicized user group. A more extensive users' guide is needed.
13. Improved capabilities are needed for real-time operations especially during droughts, gaming involving stakeholders during a simulations run, handling of evapotranspiration and agriculture demand changes over time, water transfers, Delta storage, carryover contract rights, refuge water demands and more up to date representation of Feather River, Stanislaus River, Upper American River, San Joaquin River and Yuba River operations.
14. Need an improved graphical user interface to facilitate input of model data, setting of model constraints and weights, operating the model, and displaying and post analysis of model results.
15. Need to be able to change the model time period durations for improved accuracy of model results.

Many of the above-enumerated weaknesses of CalSim II were also identified in the

survey report from the University of California at Davis. Ferreira, et al. 2003. Additional flaws in the statistical basis for CalSim II was revealed in a recent study titled *Analysis of CALSIM's Statistical Basis* by Arve Sjovold, 28 December 2005.

Additionally, an expert panel sponsored by the CalFed Science Program and the California Water and Environmental Modeling Forum recently reviewed the CalSim II model representation of the San Joaquin River. http://science.calwater.ca.gov/workshop/calsim_05.shtml. The January 2006 report titled *Review Panel Report San Joaquin River Valley CalSim II Model Review* found that the model:

* this observed!

1. Used incomplete data sets.
2. Underestimated salinity.
3. Underestimated releases of water from New Melones Reservoir that leads to overestimates of water availability to entities dependent on New Melones storage.
4. Documentation and testing was not sufficient to provide users or model results with a complete reasonable basis for understanding the accuracy and limitations of results.
5. Did not include groundwater.
6. Took loss and return flow rates from older model without re-examination and scrutiny.
7. Failed to update Westside water demands.
8. Failed to include error rates.

Since the San Joaquin River module sets boundary conditions for the Delta, errors are likely to be carried over to the rest of CalSim II's output.

Another recent critique of CalSim II titled *An Environmental Review of CalSim-II, Defining "Full Environmental Compliance" and "Environmentally Preferred" Formulations of the CalSim-II Model* by Jeffrey T. Payne and Dr. David R. Purkey of the National Heritage Institute, November 2005 (Attachment 7) was prepared in order to examine the transparency of CalSim-II and to measure the current version of the model against two important standards. This report is purposely focused on two specific questions.

1. Does the representation of environmental regulations and objectives in CalSim-II represent full compliance with current legal requirements?
2. Can CalSim-II be used to plan for water management alternatives associated with improve environmental outcomes and habitat restoration?

The NHI report does not deal with any of the other CalSim-II issues identified in the CalSim-II Peer Review. All of the issues identified in the review cause flaws in the results displayed in the SDIP EIR/S. The Natural Heritage Institute (NHI) was hired to carry out the technical analysis needed to determine whether CalSim II can answer the above questions. The first question was posed in order to assure that the current

formulation of CalSim-II is consistent with all current environmental regulations on California's water resources.

CalSim-II attempts to characterize all components of the regulatory structure. This report reviewed a significant but limited subset of these regulations. Those reviewed were selected based on the experience of a panel of environmental experts. This selection does not imply that characterizations of other regulations in CalSim-II meet the full compliance standard. In fact, it would be very valuable for the SDIP proponents to complete a similar analysis on the model characterization of all existing environmental regulations. With regards to the Full Compliance standard, NHI identified three areas where the assumptions and assertions in the current version of CalSim-II were at odds with the expert panel's interpretations of existing environmental regulations:

- **CalSim-II uses information not available to real time operators of the California water system.** This allows CalSim-II to relax environmental standards earlier than is the case in actual operations. As a result, the model under-allocates water needed to satisfy existing environmental regulations; in turn, the model makes that water available for export to south of Delta contractors or other uses.
- **CalSim-II is not faithful to Federal law that allocates water to meet ecosystem restoration objectives.** The 1992 Central Valley Project Improvement Act calls for 800 TAF of water to be allocated for environmental regulation and the logic of CalSim-II does not fully honor this requirement.
- **CalSim-II currently includes no requirement to maintain a minimum flow in the San Joaquin River below Friant Dam**, contrary to a court ruling requiring such flows. This allows for allocation of water to urban and agricultural uses in the Friant Service area rather than allocating that water to maintain water in the San Joaquin River.

For each of these deficiencies, this report proposes a series of actions that can be taken in order to improve the performance of the model. These should be considered the minimum steps required to meet the Full Compliance standard for the regulations reviewed as part of this effort.

The second question is motivated by the SDIP proponent's historic failure to protect and restore the Sacramento-San Joaquin watershed as legally required. Long-term monitoring of the system suggests that threatened and endangered fish populations are in serious jeopardy. A prudent approach to water management planning would use modeling tools that evaluate the impact of various environmental regulations on water deliveries. CalSim-II has not been crafted to include this flexibility.

As examples of the kinds of new regulations that may need to be considered before CalSim-II can be adequately used in SDIP, the expert panel identified the following regulatory changes that the model needs:

- CalSim-II should have the flexibility to shift salinity compliance points to allow more targeted tributary restoration action. For example, changing the location of the Vernalis salinity standard may reduce the burden on the Stanislaus River.
- CalSim-II should have the capacity to shift required salinity profiles in the Delta (X2) to benefit Delta-dependent species.
- CalSim-II should allow for the prioritization of tributary environmental objectives, such as targeted operation of the Nimbus/Folsom system for the American River.
- CalSim-II should allow for the modification of Delta export restrictions to target improvements in the Delta ecosystem.
- CalSim-II should not count, towards the satisfaction of environmental regulations, water that otherwise would have been released as part of unavoidable reservoir spills.
- CalSim-II should allow for the definition of flow requirements that result in periods of spring high-flow and summer low-flow conditions in Central Valley rivers.

These changes are consistent with the need to comply with existing environmental laws (CEQA, NEPA, ESA) through the evaluation of alternatives, including identifying those that are the most environmentally beneficial. Given the historic difficulty associated with returning the San Francisco Bay/Delta to a viable ecosystem, these changes would allow policy makers to engage in more thoughtful alternatives analysis.

Having completed this environmental review of the CalSim-II model the authors of the attached review say, "we are left with the profound impression that it is not a tool that can – under its current formulation – fully address the legally required water management objectives. CalSim-II is, after all, a tool that has been designed to determine how best to operate the state's hydraulic infrastructure in ways that maximize the satisfaction of contractual demands. This reality is a result of both the history of water model development in California and a general analytical approach that has held sway for decades in the field of water resources planning and analysis. This approach holds that the environment is a constraint on system operations, not one of the objectives for which the system should be managed. In order to create a tool that can investigate water management innovations designed to comply with the law and restore the environment, it is not simply a matter of adjusting a few input parameters. Instead, a reformulation of the model along the lines described in this document is needed."

This philosophy of including the environment as an objective in water resources management is gaining credence around the world. Unfortunately, in California we cannot get to this point if we limit ourselves to the current version of CalSim-II. In any event, CalSim II is an inadequate tool for SDIP alternatives analysis as it cannot be adjusted to solve for improved environmental conditions; it can only tell us how to maximize exports. In other words, CalSim II cannot measure environmental impact above baseline standards; it can only measure the impact of improving the environment on water export amounts. Project proponents have also improperly employed CalSim II results to represent precise predictions regarding potential impacts although it has not yet

been calibrated or validated for making absolute predictions values. That is not acceptable NEPA/CEQA environmental analysis.

Finally, we note that the U.S. District Court for the Northern District of California recently issued a Temporary Restraining Order in an action brought by the Planning and Conservation League against the BOR enjoining construction of the Intertie because, in part, the BOR failed to disclose the short-comings of the data or models. Here, the DEIS/R for the SDIP also fails to disclose error-bars and numerous other limitations in the modeling. The DEIS/R also inappropriately uses the model for predictive rather than comparative purposes, especially in addressing whether the project would meet specific water quality standards, maintain specific tidal levels, etc.

IX. The DEIS/R's Mitigation for Project Impact is Inadequate and Fails to Comport with Legal Requirements.

As the California Supreme Court has repeatedly emphasized, "the chief goal of CEQA is mitigation or avoidance of environmental harm." Laurel Heights I, 47 Cal.3d at 403; see Goleta II, 52 Cal.3d at 564. CEQA requires public agencies such as the County to implement this goal through a three-step process. First, the County must accurately identify, analyze, and disclose the adverse impacts of a Project. Stanislaus Natural Heritage Project v. County of Stanislaus (1996) 48 Cal.App.4th 182, 196-97. Second, the County must "identify mitigation measures for each significant environmental effect." Guidelines § 15126.4(a)(1)(A). Finally, the County must actually adopt such mitigation measures, unless it is infeasible to do so. § 21002.1(b) ("Each public agency shall mitigate or avoid the significant effects on the environment of projects that it carries out or approves whenever it is feasible to do so."); Citizens for Quality Growth v. City of Mt. Shasta (1988) 198 Cal.App.3d 433, 440-41.

"Mitigation" as defined in CEQA includes:

1. Avoiding the impact altogether by not taking a certain action or parts of an action.
2. Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
3. Rectifying the impact by repairing, rehabilitating, or restoring the impacted environment.
4. Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
5. Compensating for the impact by replacing or providing substitute resources or environments

CEQA Guidelines section 15370. This definition of the term "mitigation" adopts the definition contained in the federal NEPA regulations. The federal definition is used so that this term will have identical meanings under NEPA and CEQA for projects that are subject to both acts.

The DEIS/EIR proposes a novel set of "Mitigation Measures" for the impacts associated with the proposed actions. As discussed below, these actions will not reduce or avoid significant project impacts, but instead seem to totally rely upon the Environmental Water Account (EWA) and fail to meet the requirements of either NEPA or CEQA, as they are contingent on other actions outside the scope of, and beyond the control of, this project.

This deficiency is clearly evident in the text taken from page 6.1-2 of the DEIS/EIR:

> 1. *Avoidance Measure*. All pumping at SWP Banks that is in excess of the existing permitted capacity from November 1 through June 30 will be tracked by EWA and SWP/CVP operations staff. When EWA actions reduce exports for fish protection during this period, any pumping at SWP Banks that is above the existing permitted capacity will be reduced without cost to the EWA account, limited only by the amount of pumping reduction funded by the EWA (i.e., maximum of 100% match with EWA action).

This suggests that the proponents agree not to use the excess "Banks" pumping plant capacity to pump above the existing permitted capacity, only if, and limited by the size of, the EWA actions at that time. However, it would appear to reserve the right to exceed the permitted capacity, if any remained, after the EWA action was taken into account.

In other words, the project proposes to exceed the "existing permitted export capacity" when it suits them. Clearly this is not mitigation for project impacts, but would in fact exceed the limits of the EWA, the very measure the project relies upon to reduce project impacts.

> 2. *Crediting Measure*. From November 1 through March 31, pumping reduction credits will be given to the EWA (ranging from 10% to up to 30%) for all non-EWA pumping that is above the existing permitted capacity. Under this mitigation component, for each 100 taf of non-EWA pumping above the existing permitted capacity, a pumping reduction credit, ranging from 10 taf to 30 taf, could be used by EWA to reduce pumping during periods of high fish density.

This measure appears to offer a 1:10 (or a 3:10) exchange for non-EWA pumping above the existing permitted capacity, between November 1 and March 31. Again, the project proposes to permit "non-EWA pumping above the existing permitted capacity" as it suits them.

The limitation of actions to mitigate for losses that may occur during the May 16 to May 31 pumping, which is subject to actions by the EWA, is not mitigation. There is no certainty to the proposed mitigation and it is subject to an action that is unrelated to this project. As such, it has not met the test of mitigation, since it is not available without other independent actions. Further, the decision maker cannot with any certainty

determine the level of mitigation being proposed, since the nature of the external actions cannot be determined.

EWA may not even be there if they can secure funding to carry it out.

Given the definition from CEQA, it is difficult to see how the various proposed mitigation measures in the DEIS/R are valid. For example, "Mitigation Measure Fish–MM–1 " is premised on another action by an unrelated event i.e., the actions of the EWA. Nowhere in the definition is the mitigation, of acknowledged impacts, made subject to contingencies based on an unrelated event. The DEIS/R also fails to make provision for mitigation in the event EWA actions are not taken to reduce entrainment. As a result, MM-1 relies entirely on an existing program, the EWA, to mitigate new impacts associated with the SDP. The EWA has already proven unsuccessful at protecting aquatic species in the Delta. This existing program cannot satisfy the requirement that impacts associated with the SDIP be mitigated, especially since EWA winter pumping has been targeted by the IEP POD studies as a potential cause of the loss of Delta smelt in the winter. Finally, studies (or initiatives) are not mitigation.

Mitigation Measure Fish-MM-3: Minimize Entrainment Losses of Delta Smelt Associated with Increased SWP Pumping (Volume 1 – Page 6.1-96) states that "[t]he SWP has proposed increased funding through an amended Four-Pumps Agreement to support SDIP mitigation measures, including an expanded EWA. In the absence of the EWA, that increased funding would continue to be available to DFG to mitigate impacts of the SDIP through purchases of water to reduce pumping during critical periods for fish or other mitigation strategies developed through the adaptive management process." The funds in the Four-Pumps Agreement are mitigation for on-going losses of fish the result of the existing operations of the SWP. Why would those funds be used to then permit additional damage? Those funds are (or should be) fully encumbered for existing loss mitigation. It is the worst form of chicanery to propose the use of these funds to permit the projects to increase their impacts on the populations of fish we are trying to preserve.

why should DFG have to purchase water?

Impact Fish-68: Operations-Related Increases in Entrainment Losses of Splittail (Volume 1 – Page 6.1-99) acknowledges spawning on the San Joaquin River, and an increase of up to 40% in entrainment (10 to 20% in other years), but concludes that no mitigation for these increases is warranted due to the Sacramento River production, and the fact that they occur in the drier years. The loss is acknowledged, the impacts can be avoided or minimized, and the mitigation is feasible but proponents simply decided that they just don't want to do it. This is unacceptable and in violation of CEQA and NEPA.

The bottom line is that the DEIS/R relies upon the EWA for mitigation despite the complete lack of credible studies documenting the success of the EWA in reducing adverse impacts from water exports. Indeed, the decline in Delta fish species has occurred and accelerated concurrent with increased exports and operation of the temporary barriers. As an added insult, the DEIS/R states that mitigation measures would be carried out "if necessary." The DEIS/R must clearly define precise mitigation measures that will be established and the specific assurances that will ensure that the mitigation measures will be successfully implemented.

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Thank you for considering these comments. Please place us on all lists to receive the FEIS/R, notice of hearing dates and the Notice of Determination. We reiterate our request that the comment period be extended another 30 days in order to allow sufficient time to review and analyze the 2,788 pages of this document.

Sincerely,

Bill Jennings
Chairman & Executive Director
California Sportfishing Protection Alliance

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CSPA SDIP Comments Attachment 1

Comments on

Draft Environmental Impact Statement Environmental Impact Report
South Delta Improvement Program

Prepared by

Bureau of Reclamation for the U .S. Department of the Interior and the Department of Water Resources for the State of California Resources Agency'

Submitted by

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The Department of Water Resources (DWR)/US Bureau of Reclamation (USBR) (DWR/USBR, 2005) draft EIS/EIR states,

> *"The general purposes of the SDIP were identified by the Agencies, as follows:*
>
> *(c) increase water deliveries and delivery reliability for State Water Project (SWP) and Central Valley Project (CVP) water contractors south of the Delta and provide opportunities to convey water for fish and wildlife refuge purposes by increasing the maximum permitted level of diversion through the existing intake gates at Clifton Court Forebay from 6,680 to 8,500 cubic feet per second.*

Basically, in this draft EIS/EIR DWR/USBR have attempted to justify increasing the amount of South Delta water exported by the Central Valley Project (CVP) and State Water Project (SWP).

The Draft EIS/EIR further states,

> *"The impact assessment focuses on benefits and impacts to hydrology, water quality, fish resources, recreation, vegetation and wildlife, ..."*

We are familiar with current water quality issues in the South Delta and the generally inadequate understanding of how the current South Delta water exports through the CVP and SWP impact Delta water quality. **We find that the draft EIS/EIR for the proposed expanded export of South Delta water is significantly deficient in providing an adequate, reliable discussion of the potential water quality impacts of the proposed project.**

At the time of the notice of preparation of this EIR/EIR we were highly involved in a study of the low dissolved oxygen (DO) problem in the San Joaquin River (SJR) Deep Water Ship Channel (DWSC). We were the coordinating principal investigators for a $2-million CALFED-supported study of the characteristics of the low DO problem, factors

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influencing the DO in the DWSC, the sources of the oxygen demand, and potential approaches for controlling the concentrations of DO in the DWSC to eliminate violations of the DO water quality objective (WQO). It was through those studies that we found that the CVP and SWP exports of South Delta water were a major factor contributing to the low-DO problem in the SJR DWSC.

We developed a SJR DWSC low-DO "Issues report" for the SJR DWSC TMDL Steering Committee that identified and described many of the issues that needed to be addressed as part of studying the nature of the DWSC low DO problem (Lee and Jones-Lee, 2000). We also developed a Synthesis Report summarizing and integrating the results of the approximately $4-million of studies conducted by about a dozen investigators on the DWSC low-DO problem (Lee and Jones-Lee, 2003a). That synthesis report also presented our findings on the impact of SJR flow in the DWSC on DO depletion below the WQO. Of particular importance were the results of the DWR D-1641 SJR cruises, in which DO was measured at about biweekly intervals from late summer to early winter at the Rough and Ready Island DO monitoring station, and the USGS monitoring of SJR DWSC flow. Lee and Jones-Lee (2003a) reported that when the SJR DWSC flows were on the order of a few hundred cfs, severe low-DO problems occurred in the DWSC. However, when the SJR DWSC flows were above about 1,500 cfs there were no DO WQO violations in the DWSC.

Since completion of the synthesis report we have continued to examine the relationship between SJR DWSC flow and DO WQO violations, and have issued a series of reports of our findings (Lee 2003a, b, 2005a,b; Lee and Jones-Lee 2003a,b,c; 2004a; 2005a,b,c). Those follow-up studies have confirmed that low SJR DWSC flow is a major factor contributing to violations of the DO WQO in the DWSC. It has also been noted that the export of South Delta water through the USBR CVP and DWR SWP is the primary cause of low SJR flow in the DWSC. Basically those projects at times, draw most of the SJR Vernalis water into the South Delta through the Head of Old River to the CVP and SWP export pumps. Figure 1 presents a map of the Delta area of concern in the Delta Improvement Package.

When the SDIP request for comments on the CEQA scope was issued, it was with this background that Lee (2002) submitted comments on the water quality issues that needed to be addressed in the EIS/EIR. Lee (2002) stated,

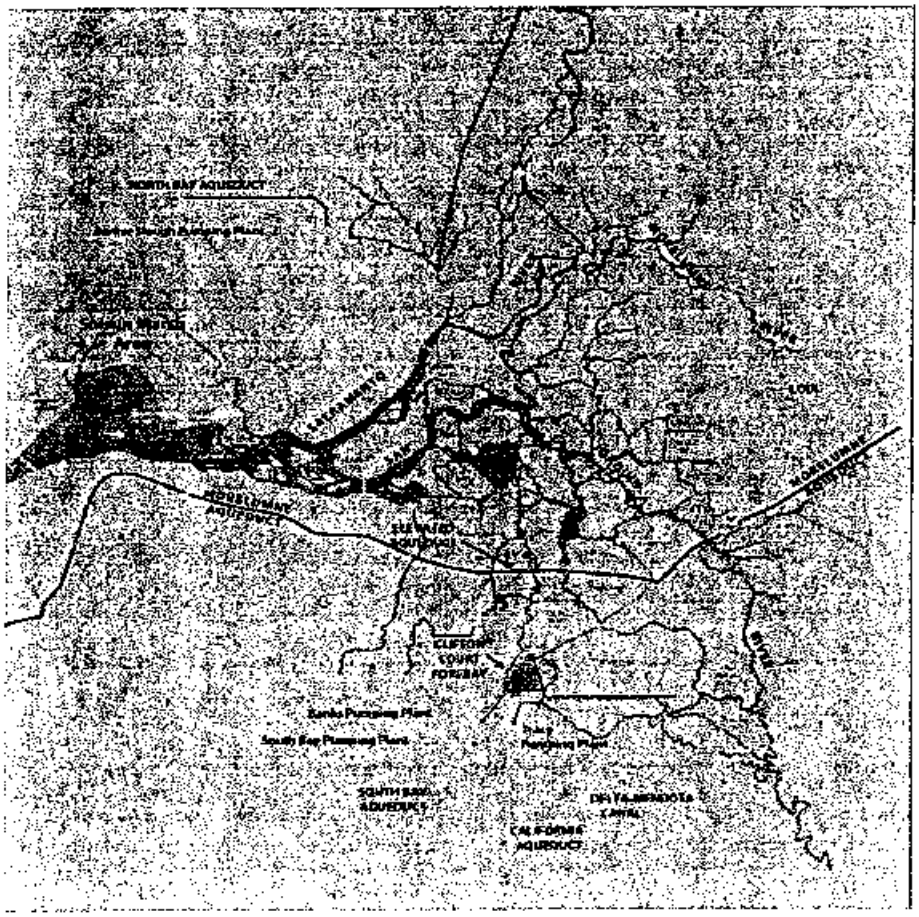
> "*A credible, certifiable EIR/EIS for the SDIP should include a detailed evaluation of the full range of water quality problems caused by the South Delta diversions and how they will be corrected as part of implementing the SDIP.*"

Lee (2002) also stated,

> "*As discussed in these reports, the South Delta currently has significant water quality problems of low DO, currently-used pesticide caused aquatic life toxicity, legacy organochlorine pesticide excessive bioaccumulation in edible fish which are a threat to cause cancer in people who use the fish as food, excessive*

nutrients and elevated salts and TOC. Dr. Anne Jones-Lee and I have just completed a review for the Central Valley Regional Water Quality Control Board

Figure 1



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on the organochlorine pesticide and PCB excessive bioaccumulation problems in Central Valley fish, which shows that Old River and Paradise Cut fish have excessive concentrations of legacy pesticides that are a threat to the health of those who use these fish as food."

There is no doubt that the existence and operation of the permanent operable barriers will have water quality impacts, many of which are not currently recognized.

A number of key factors will ultimately govern how the operable barriers are operated. Salinity is only one of those factors. Others include:

- potential impacts on the low-DO problems,
- excessive bioaccumulation of mercury, organochlorine "legacy" pesticides, and PCBs that accumulate in fish and other organism to threaten the health of those who eat those organisms,
- aquatic life toxicity, and
- other pollutants in several of the South Delta channels.

Lee and Jones-Lee (2004b) have provided a comprehensive review of Delta water quality issues that need attention as part of evaluating the potential impacts of the SDIP.

A review of the "Water Quality" section of the draft EIS/EIR shows that the draft EIS/EIR does not conform to CEQA requirements of providing full disclosure of potential environmental impacts of the proposed SDIP. Instead, consideration of water quality impacts has been essentially limited to potential impacts on salinity in South Delta Channels. The current modeling of salt, a conservative parameter, does not address the behavior and impacts of non-conservative pollutants such as pesticides that cause aquatic life toxicity. While there is mention of low-DO situations in some South Delta channels, the discussions are superficial and inadequate to inform the readers of the draft EIS/EIR about the potential impacts of the proposed increased export of water on the low-DO situation in South Delta channels.

The draft EIS/EIR also fails to address the large number of other water quality issues in the South Delta that have been impacted by the current water exports by the CVP and SWP and that will be exacerbated by the increased water exports that will occur if the proposed SDIP is approved. Further, there is no discussion of the impacts of the proposed operation of the operable barriers that are part of the proposed SDIP. As indicated above, the Lee and Jones-Lee (2004b) review of Delta water quality issues provides a discussion of the lack of understanding of impacts of the CVP and SWP on the large number of water quality issues that exist in the Delta overall and especially the South Delta. Many of the Delta channels have been listed as US EPA Clean Water Act (CWA) Section 303(d) impaired due to excessive concentrations of variety of pollutants compared to WQOs.

DWR and the USBR have not complied with SWRCB (2000) Water Rights D-1641 requirements to reliably delineate the potential impacts of exporting South Delta water on Delta water quality. Lee and Jones-Lee (2004b) observed that those agencies have

apparently convinced the IEP managers that the proposed exports will not cause any water quality impacts and that there is no need to conduct a comprehensive water quality monitoring/evaluation in the Delta to assess the impacts of the exports. The fallacy of that approach was clearly brought to light in the findings of an independent expert panel review of the current pelagic organism decline (POD) (POD Review, 2005). The POD has resulted in a crash program to attempt to quickly gather information to define and understand the potential combined impacts of CVP and SWP exports on POD. Lee and Jones-Lee (2005a) discussed the problems with that approach, which stem from the subtle nature of potential impacts of exports on water quality.

During the past six months we have been developing a San Joaquin River Water Quality Issues Report (Lee and Jones-Lee, 2006) as a follow-up to our Delta Water Quality Issues report (Lee and Jones-Lee, 2004a). Table 1, taken from Lee and Jones-Lee (2006), lists the current TMDLs for the SJR. The Lee and Jones-Lee (2002, 2006) SJR water quality issues reviews also list a number of potential water quality issues that could readily lead to CWA section 303(d) listings for the SJR that would require TMDLs to be developed to control the loads/conditions that are causing WQO violations.

WQO violations that occur in the SJR at Vernalis can also contribute to WQO violations in the South Delta as a result of the CVP and SWP export projects' drawing most of the SJR Vernalis water into the South Delta either through the Head of Old River or through Turner Cut. As discussed by Lee and Jones-Lee (2006), this results in the carrying of SJR water quality problems into the South Delta and to some extent into the Middle Delta. The proposed SDIP will amplify the water quality impacts of the SJR watershed as well as contribute locally derived pollutants. A credible EIS/EIR for the SDIP must include an evaluation of the potential impacts of the proposed increase in exports and an assessment of the impacts of the operation of the operable barriers on Delta water quality. This will require a large-scale, focused, comprehensive, multi-year monitoring and evaluation program, with particular attention to Delta aquatic life resources, to gather the background information needed to begin to reliably assess the potential impacts of the proposed SDIP on Delta water quality. The current POD studies are not focusing on many of the issues that will need to be addressed in order to develop a credible EIS/EIR for the SDIP.

Because of this major deficiency, the current draft EIS/EIR is inadequate and rejected as failing to comply with CEQA requirements. DWR and USBR should be required to fund a multi-year monitoring/evaluation program delineated by an independent panel of experts that would be responsible for organizing the studies, overseeing the implementation of the studies, reviewing results as they are developed, and reviewing the appropriateness of the draft reports and conclusions. This study program review should be conducted in a manner that provides the public with adequate opportunity to be informed of the progress and findings of the review and to provide and have considered comments on the approach and findings. It will take several years of study and assessment to obtain an adequate information base upon which to develop an EIR/EIR that could reliably assess the water quality impacts of the then proposed SDIP involving

increased CVP and SWP exports of South Delta water, and the potential consequences of various methods of operable barrier operation approaches.

Table 1. San Joaquin River Watershed TMDLs
Updated from Lee and Jones-Lee (2002)

Current (Active)
- Selenium
- Salinity at Vernalis, Total Dissolved Solids (TDS), Electrical Conductivity (EC)
- Boron
- Organophosphorus (OP) Pesticides (Diazinon, Chlorpyrifos)
- Oxygen-Demanding Substances (BOD/Algae, Ammonia, Organic N)

Pending (to be Developed)
- Organochlorine "Legacy" Pesticides (DDT, Chlordane, Dieldrin, Toxaphene, etc.)
- PCBs
- Dioxins/Furans
- Mercury
  - Sulfate (Bioaccumulation of Mercury)
- Pathogen-Indicator Organisms, *E. coli*, Fecal Coliforms
- Toxicity of Unknown Cause
- Salinity Upstream of Vernalis

Potential Future (to be Evaluated)
- Nutrients, Excessive Fertilization (Nitrogen and Phosphorus Compounds)
  - High pH, Low DO caused by Excessive Fertilization (Photosynthesis/Respiration)
- Alternative Pesticides to OP Pesticides including the Pyrethroid-Based Pesticides that are Causing Water Column and Sediment Toxicity
- PBDEs.
- Total Organic Carbon, and other chemicals such as Bromide that develop into Disinfection Byproducts (Trihalomethanes) in Treated Domestic Water Supplies
- Excessive Sediment, Erosion, Turbidity
- Herbicides (Toxicity to Algae)
- Aquatic Sediment Toxicity, (Pesticides, Nutrients/Algae/Sediment Ammonia, Heavy Metals, PAHs and other Chemicals)
- Unrecognized Pollutants
  - Pharmaceuticals and other Unregulated Chemicals Discharged by Confined Animal Facilities (dairies, feedlots, etc.) and domestic wastewaters

A key part of the monitoring/evaluation program should be an assessment of the mitigation that DWR/USBR would need to implement to eliminate, to the maximum extent practicable, the adverse water quality and aquatic life impacts of the current export of South Delta water for the projects.

One of the conditions that also need to be evaluated in this program is the beneficial impacts of reduced South Delta exports by CVP and SWP from the current conditions.

Incorporation of this approach is justified since the current water export rates were not based on a reliable assessment that they could be practiced without adverse impacts on Delta aquatic ecosystems.

The draft EIS/EIR Chapter 5 Section 3 presents DWR/USBR's assessment of SDIP impacts on "Water Quality". The introduction to that discussion states,

> *"5.3 Water Quality*
>
> *Introduction*
>
> *The maintenance of beneficial uses of Delta waters depends on several key water quality variables (e.g., salinity, water temperature, dissolved oxygen, and dissolved organic carbon) in Delta waters. This chapter describes these key water quality variables, the objectives associated with maintaining beneficial uses of Delta waters, existing Delta water quality conditions, and impacts of the SDIP project on selected water quality variables in Delta channels and exports."*

That chapter then reviews the perceived impacts of the SDIP increased exports and barrier operations on "Water Quality." It is stated in Chapter 5,

> *"Summary of Significant Impacts*
>
> *There are no significant impacts on water quality as a result of implementation of the project alternatives. Operation of the tidal gates provides substantial improvements in salinity in the south Delta channels. There are occasional slight increases in salinity occur in the CCWD intakes and at SWP Banks, but these are less than 5% of the baseline values. The water quality benefits are less under Alternative 4B, which includes constructing only the head of Old River gate."*

In the subsequent section it is stated,

> *"Affected Environment*
>
> *Delta waters serve several beneficial uses, each of which has water quality requirements and concerns associated with it. The Delta is a major habitat area for important species of fish and aquatic organisms, as well as a source of water for municipal, agricultural, recreational, and industrial uses. Dominant water quality variables that influence habitat and food-web relationships in the Delta are temperature, salinity, suspended sediments (SS) and associated light levels for photosynthesis, DO, pH, nutrients (nitrogen and phosphorus), DOC, and chlorophyll. Other key constituents that are monitored in water for municipal are bromide (Br–) concentrations (measured in raw water) and concentrations of THMs or other chemical by-products formed during the disinfection of water (measured in treated water).*

what about selenium, mercury, pesticides, etc !!

That presentation of so-called water quality impacts illustrates one the fundamental flaws of DWR/USBR's approach to water quality evaluation. The focus of the DWR and

USBR discussion is on selected aspects of municipal and agriculture uses of Delta waters. Those who understand water quality know that water quality impacts of a proposed project must be evaluated from all perspectives, as they relate to the impairment of the beneficial uses of a waterbody. DWR/USBR considers water quality as being limited to the quality of the water that is exported. These agencies largely ignore the vast arena of conventional water quality issues associated with the impacts of pollutants on the beneficial uses of a waterbody.

Key

The federal congress defined water quality in the Clean Water Act in terms of all designated beneficial uses of a waterbody. By definition in the CWA, the exceedance of a water quality standard/objective is an impairment of beneficial uses of a waterbody that must be corrected. As discussed by Lee and Jones-Lee (2004b) there are highly significant water quality problems in the Delta that are caused by known chemicals that that occur at concentrations above the applicable WQO for the Delta channels. Most importantly with respect to Delta water quality, water manipulation/diversions/exports do impact how pollutants in the Delta impact aquatic life-related beneficial uses of Delta waters. Changing the flow of water in the Delta will impact the location and magnitude of pollutant impacts on aquatic life and other beneficial uses of Delta waters.

An example of this can be seen with the potential impacts in the SJR by sulfate that is brought into the South Delta by the CVP and SWP. The concentration of sulfate affects the methylation of mercury. The CVRWQCB (2005) has indicated that the manipulation of flows in the South Delta as part of DWR-proposed operation of the operable barriers could affect the distribution of sulfate in the South Delta channels which, in turn, could affect the bioaccumulation of mercury in edible fish. There is need to evaluate how the operation of the South Delta operable barriers that are scheduled to be installed and operational by 2009 could affect the bioaccumulation of mercury in South Delta fish.

we just ~~only~~ ~~that~~ ... yes!!!

In testimony before the SWRCB hearing on the DWR and USBR draft Cease and Desist Order to prevent violations of the South Delta Salinity standard established as part of D-1641, Lee (2005c) indicated that DWR, as part of developing the operation of the South Delta operable barriers, will need to expand its scope of evaluation of barrier operation to include not only EC but also the impact of sulfate on mercury bioaccumulation. In addition, that evaluation should include the impact of barrier operations on the impacts of the other pollutants on the CVRWQCB 303(d) list for South Delta channels and other constituents that, while not on the 303(d) list, are impacting South Delta water quality. Lee (2005c) also suggested that DWR needs to more reliably evaluate the potential benefits of installing low-head, reverse-flow pumping across the permanent operable barriers to bring more Sacramento River water into the South Delta. Adoption of this approach could be highly cost-effective in improving South Delta water quality as well as the quality of the CVP-exported water. It could also help solve the low-DO problem in the DWSC.

Overall, the draft EIS/EIR cannot be certified as a credible discussion of SDIP water quality impacts. It does not provide a reliable evaluation of how the increased exports

and operation of the barriers will impact the aquatic life related beneficial uses of the Delta.

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Background of Drs. G. Fred Lee and Anne Jones-Lee
Pertinent to Assessment of San Joaquin River and Delta Water Quality

Dr. G. Fred Lee is President of G. Fred Lee & Associates, a specialty environmental quality consulting firm located in El Macero, CA, near Sacramento. He and Dr. Anne Jones-Lee, the principals of the firm, work on issues, projects, and problems of water supply water quality, water and wastewater treatment, water pollution control in both fresh and marine surface waters, and solid and hazardous waste impact evaluation and management, with particular emphasis on groundwater quality protection. Their client base includes governmental agencies, industry, public interest groups, and individuals.

Dr. Lee earned a BA degree from San Jose State College in environmental health sciences in 1955, a Master of Science in Public Health degree focusing on water quality issues from the University of North Carolina in 1957, and a PhD degree in environmental engineering/environmental science from Harvard University in 1960. For a period of 30 years beginning in 1960, he held university graduate-level professorial teaching and research positions at several major US universities, including the University of Wisconsin, Madison, the University of Texas system, and Colorado State University. In the 1980's he was Distinguished Professor of Civil and Environmental Engineering at the New Jersey Institute of Technology and Director of the Site Assessment and Remediation division of a multi-university hazardous waste research center there; for a several-year period, he also served as Director of the Water Quality Program for the State of New Jersey Sea Grant Program. During his university teaching and research career he conducted in excess of five million dollars of research and published over 500 papers and reports on those efforts.

Dr. Anne Jones-Lee earned a BS degree in biology from Southern Methodist University and a PhD degree in Environmental Sciences in 1978 from the University of Texas at Dallas focusing on water quality evaluation and management. She held university professorial positions for 11 years in environmental engineering and environmental sciences. Most recently she held the position of Associate Professor of Civil and Environmental Engineering with tenure at the New Jersey Institute of Technology. She and Dr. Lee have worked together as a team since the mid-1970s.

In 1989, Dr. Lee retired from university teaching and research; with Dr. Jones-Lee he expanded his part-time consulting activities into a full-time activity, and moved their base of operation to the Central Valley of California. They have continued to be active in publishing the results of their studies; in the past 15 years they have developed another 600 papers and reports covering work they have done in their various areas of activity, one of which is San Joaquin River and Delta water quality.

Dr. Lee's areas of expertise include the fate, effects and impacts of chemical constituents and pathogens on various aspects of water quality/beneficial uses of waterbodies. He has frequently served as an adviser to local, state, national and international governmental agencies and other entities on a variety of aspects of water quality, including the development and implementation of water quality criteria and standards. He served as an

invited peer reviewer for the National Academics of Science and Engineering "Blue Book" of water quality criteria in 1972, a member of the American Fisheries Society Water Quality Committee that reviewed the US EPA's "Red Book" water quality criteria of 1976, and a US EPA invited peer reviewer in the early 1980s for the approach that the Agency then proposed, and ultimately adopted, for developing water quality criteria for protection of aquatic life. That criteria development approach is still in use today. Further, Dr Lee was involved as a US EPA invited peer reviewer for several criteria documents. His work on water quality issues is somewhat unusual, in that, in addition to having a strong background in the chemical and biological sciences pertinent to water quality evaluation, he has an engineering background that provides a foundation for developing and evaluating control programs for chemical constituents in point and nonpoint source discharges.

Dr. Lee's involvement in Delta water quality issues began in the late 1980's when, while still in New Jersey, he became involved in three different consulting projects in California; one was concerned with Delta water quality issues, another with Lake Tahoe water quality, and the third with groundwater quality protection in the San Gabriel Basin on behalf of the Metropolitan Water District of Southern California. As a consultant to Delta Wetlands on water quality issues associated with the development of in-Delta storage reservoirs he became familiar with Delta water quality issues. Since then, Dr. Lee's work on Delta water quality issues has included participating in various CALFED (now California Bay-Delta Authority – CBDA) committees, subcommittees, working groups, etc., concerned with water quality issues in the Delta and its tributaries.

Beginning in the mid-1990s Dr. Lee became involved in the details of water quality issues in both the Sacramento and San Joaquin River watersheds. One aspect of his involvement was as a volunteer technical advisor to the DeltaKeeper (William Jennings) to help the DeltaKeeper establish and maintain a technically sound grounding as it addresses issues pertinent to the protection and enhancement of water quality in the Delta and its tributaries. Dr. Lee's work with the DeltaKeeper has included such matters as managing aquatic life toxicity in the Central Valley and Delta caused by runoff/discharges of pesticides from agricultural and urban areas; reviewing and managing excessive bioaccumulation of organochlorine legacy pesticides and PCBs in Central Valley waterbodies and the Delta; reviewing potential environmental impacts of aquatic pesticides used for aquatic weed control in the Central Valley and Delta; assessing the impacts of flow management in and from the South Delta on water quality; and providing guidance on environmental aspects of dredging and dredged sediment management in the Delta.

Another key aspect of Dr. Lee's involvement continues to be the low-DO problem in the San Joaquin River Deep Water Ship Channel. In 1999, Dr. Lee began to work closely with the SJR DO TMDL Steering Committee, as well as the Central Valley Regional Water Quality Control Board (CVRWQCB) staff, in helping to improve the level and quality of science and engineering incorporated in the San Joaquin River low-DO TMDL program. Dr. Lee was awarded a contract with the CVRWQCB to develop an "Issues" report to identify and discuss the issues that need to be addressed as part of formulating a

TMDL to control the low-DO problem in the San Joaquin River DWSC (Lee and Jones-Lee, 2000).

Dr. Lee worked closely with the CVRWQCB lead staff (Dr. Chris Foe) in developing a coherent two-million-dollar proposal, which was funded by CALFED. Dr. Lee served as the coordinating PI for the 12 projects that were conducted under this proposal. From the work, Lee and Jones-Lee (2003) developed the "synthesis report" that presents a summary/synthesis of approximately four years and four million dollars of studies on the SJR DWSC low-DO problem. Since completion of that synthesis report in March 2003, Drs. Lee and Jones-Lee have continued to be active in Delta water quality issues and develop a supplement to synthesis report (Lee and Jones-Lee, 2004a). They have also developed a comprehensive report on Delta water quality issues (Lee and Jones-Lee, 2004b). Lee and Jones-Lee (2006) are developing a comprehensive report on San Joaquin River water quality issues. These and other reports on these issues are available from their website, www.gfredlee.com, in the San Joaquin River Watershed section at http://www.gfredlee.com/psjriv2.htm.

Further information on Drs. Lee and Jones-Lee's expertise and experience pertinent to assessment of Delta water quality issues is available on their website, www.gfredlee.com, or upon request.

References Cited in Qualifications

Lee, G. F. and Jones-Lee, A., "Issues in Developing the San Joaquin River Deep Water Ship Channel DO TMDL," Report to Central Valley Regional Water Quality Board, Sacramento, CA, Report of G. Fred Lee & Associates, El Macero, CA, August (2000). http://www.gfredlee.com/sjrpt081600.pdf

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re: SDIP

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
Southwest Region

January 11, 2007

In response refer to
2006/03464

CNV-2B
attachment
#4
(2 pgs)

Alan R. Candlish
Regional Planning Officer
Bureau of Reclamation
Mid-Pacific Regional Office
2800 Cottage Way
Sacramento, California 95825-1898

Dear Mr. Candlish:

NOAA's National Marine Fisheries Service's (NMFS) intends to suspend formal consultation for the South Delta Improvements Program (SDIP). During the course of the project effects analysis, several areas of significant concern arose. These concerns were:

1. The interrelated aspects of the SDIP barrier construction actions with the long term operations of the Central Valley Project (CVP) and State Water Project (SWP) under the operations and criteria plan (OCAP). Analysis of the SDIP as a separate project without consideration of how it will be used under OCAP would be seen as piecemealing under the Endangered Species Act. The stated objectives and purposes of the SDIP confirm the interdependence and interrelatedness of the two projects.

   - Increase water supply to the SWP and the CVP water contractors south of the Delta by increasing diversions at the existing Clifton Court Forebay radial gates and maximizing the frequency of 8,500 cubic feet per second (cfs) pumping at the Harvey O. Banks Pumping Plant (Banks).

   - Ensure water of adequate quantity and quality for agricultural diverters within the south Delta.

   - Reduce entrainment of Central Valley fall late fall run Chinook salmon (*Oncorhynchus tshawytscha*) from the San Joaquin River

2. The CalSim-II (SWP and CVP Operating Model) modeling analysis done for the SDIP is no longer in harmony with the current modeling being done for the reinitiated OCAP consultation. NMFS staff is aware of the changes being considered for the baseline programming assumptions in the reinitiated OCAP consultation, and has previously indicated that both SDIP and OCAP computer

simulations must be based on the same common modeling assumptions to be valid and comparable.

3. The modeling conducted for the SDIP actions neglected to assess the use of the permanent barriers with the current level of water diversion (6,680 cfs). This modeling run is important to know since the future increase in the SWP diversion rate to 8,500 cfs is not a guaranteed action. The "base line" modeling done with the permanent barriers under the 2004 OCAP modeling runs assumed that the diversion rate was 8,500 cfs. The "interim" period of barrier operations between completion of construction and the increase to water diversions of 8,500 cfs has not been presented to NMFS staff in the Action Specific Implementation Plan.

4. The true baseline conditions in the South Delta occur during the period between November 30 and April 7 of each year when the barriers are absent from the channels of the South Delta. The alterations in hydrology of the barrier installations from the true baseline have not been presented in a coherent fashion within the modeling run outputs.

NMFS recommends that the SDIP Stage 1 and stage 2 actions be incorporated into the overarching OCAP action. This will avoid inconsistencies with the modeling assumptions between the two actions. In addition, by combining the two actions into one, all of the interacting effects of the two proposed actions are addressed at the same time in one consultation rather than breaking the effects into two consultations. This avoids the appearance of piecemealing the projects. Although other activities linked to OCAP have been proposed (e.g., Yuba Accord water transfers, Red Bluff Diversion Dam Fish Passage Improvement Program, etc.), their potential effects to water operations are less clear. These activities will be evaluated for inclusion in the OCAP consultation on a case by case basis.

Please contact Mr. Jeffrey Stuart at 916-930-3607, or via e-mail at JStuart@noaa.gov if you have any questions concerning this response or require any additional information.

Sincerely,

Rodney R. McInnis
Regional Administrator

cc: Copy to File – ARN 151422SWA1999SA5950
NMFS-PRD, Long Beach, CA
Katherine F. Kelly, Chief, Bay-Delta Office, California Department of Water Resources, 1416 9th Street, Sacramento, CA 95814

California Department of Water Resources
SWP Reliability Report-Attn: Johnnie Young-Craig
P.O. box 042836
Sacramento, CA 94236-0001

December 19, 2005

ENV-28
attachment
#5
(6 pgs)

Subject: The State Water Project Reliability Report 20005—Draft

Dear Sirs:

The report informs us that it is an update to the 2002 edition of the report of the same name. The foreword states that DWR will update this information every 2 years. However, the Department of Water Resources is derelict in not acknowledging that this report is a requirement of the amendments to the SWP contracts that was agreed to in the settlement negotiations pursuant to the Monterey litigation.

Purpose

The report is not simply information to help the contractors understand to what degree they can rely on SWP deliveries, but in fact is an essential requirement stemming from the need to eliminate "paper water" from the contracts. The Appellate Court was clear on the problems in planning that proceeded from the previous interpretations allowed by DWR that in effect created the notion of "paper water." In the settlement negotiations it was made clear that a well documented and unambiguous report of delivery reliability was essential to the elimination of "paper water." Accordingly, this report must be reviewed with that primary objective in mind.

Does the report fulfill that purpose? Its self-defined scope certainly allows for that possibility, but without serious calibrations of the main analytic tool, CALSIM II, used to perform the analysis, it is doubtful that it can. This deficiency has been pointed out many times over the past several years and DWR has still failed to come to grips with it. Their limited study, whose results are summarized in the draft, do little to meet the requirements of a legitimate calibration. Calibration, properly done, allows the program developers to assure that all elements of the computer program work properly. In the case of CALSIM II the calibration will show from where in the operational regimen of the SWP the increased amounts of water it predicts will materialize. Even the Scientific Peer Review Committee stated as much; they noted without a proper calibration there is no assurance that the results that are calculated from an optimization routine are a real solution. They must be shown to conform to realistic operations that are known to be feasible. No where in the report is this demonstrated or even hinted at.

Previously Noted Deficiencies

The lack of calibration and other deficiencies have been made known the DWR in formal comments on the 2002 draft. On reading this draft there seems to be no acknowledgement that any of these deficiencies have been addressed. The list of these previous deficiencies is highlighted below.

1

1.) The frequency diagrams are without statistical merit and therefore cannot be used to provide estimates of "reliability."

2.) The draft continually refers to CALSIM II as a "simulation." Until CALSIM II has been calibrated to show that it conforms to a real and feasible operational regimen, its results cannot be interpreted as though it is a simulation. Even then, its computerized configuration is not even close to what is ordinarily referred to as "simulation." CALSIM II is an optimization model in which the objective function is to maximize exports of water from the Delta given certain constraints. In typical optimization models not all solutions are feasible. Only calibration can establish that possibility. This model does not meet that criterion.

3.) The model makes certain assumptions about the individual contractors' demand for SWP deliveries. Those demand functions have not been vetted against the realistic capabilities of each contractor to take SWP water. In one case the assumption is factually wrong- San Luis Obispo County physically cannot take its full Table A amount of 25,00 acre feet because it is limited by physical capacity of the SWP pipeline to only 4800 acre-feet. Nonetheless, the model assumes that SLO County will take 25,000 acre-feet when it is available at the Delta. Also there are some contractors that are unable to take their full Table A amount simply because they don't have the proper amount of equalizing storage to take the water when the SWP says it is available. The demand functions have not taken these and many other considerations into account. Because the model is an optimization against these demand functions the results cannot be taken at face value until the demand functions have been made realistic in terms of the requirements of the individual contractors.

4.) The report uses a definition of reliability that follows from their construct -ion of the frequency charts they use to summarize the results. When they state for example that the project can deliver 73% reliability, that is an incorrect interpretation of the data in the chart. In fact, the point at which 73% of the Table A water is delivered is actually the 50% point in the frequency chart. The correct statement would be: The project can deliver 73% of the water 50% of the time. However, this is not quite true either because the frequency charts are not statistically valid and insufficient to support an estimate of delivery reliability.

Additional Deficiencies

There are also some additional deficiencies that have since been revealed through careful studies of the CALSIM II model. These have to do with the assumptions on constraints and some fundamental errors in the statistical basis of the model's inputs.

2

The model exercises for this report assume that SWRCB rules that operate to constrain export pumping will continue unchanged into the future. If the model results showed that future export pumping would continue at about the same level, that may perhaps be a defensible assumption. However, we have the case where the model results show that on average future export pumping will be 50% greater than the recent historical average under most all anticipated hydrologic conditions. Given that result it would seem prudent to examine to what degree SWRCB rules might be modified in anticipation of the environmental damage to be expected with such an increase in export pumping. The model does not do that. In fact, before these results can be used by anyone, the model's calculations should be explored to discover where and to what degree existing historic pumping regimens are expected to change. After all, the existing rules were developed in response to concerns with the operational problems that were demonstrated along the way during historic pumping. The rules certainly cannot be interpreted as definitive statements on what is acceptable for the Delta environment irrespective of the levels of export in the future.

The model also uses a sub-model to calculate the movement of the X 2 salinity threshold in the Delta as a function of hydrologic conditions. Unbelievably the sub-model calculational routine does not include the level of pumping. It is difficult to believe that the movement of the salinity threshold is independent of export pumping. Furthermore, given that CALSIM II predicts a 50% increase in exports over historic levels it would seem prudent to examine whether this simple routine is really applicable at that higher level. The research that went into the development of this calculational routine should be peer reviewed. The same may be said with the entire modeling of cross Delta transport calculations.

Perhaps the greatest problem with CALSIM II is its total disregard for proper statistical analysis in the development of the model. It is easy to verify that the input hydrology to the model represents a complex statistical distribution. In fact, it is what is referred to by statisticians as "bi-modal" meaning there are two main modes. One significant consequence of this feature is that the grand average of the total 73 year record is a very unlikely occurrence. All references in the report to average deliveries over 73 years are totally misleading.

The two modes clearly depict a collection of dry years and another of wet years. There are slightly more cases of dry years than wet ones although for practical purposes they are roughly equal. It is also the case that except for droughts there is virtually no serial correlation year-to-year. This means that a wet year may be followed with equal likelihood by either a dry or wet year. The fundamental problem that SWP operators must continually face is under what conditions is it prudent to pump given uncertainty in what kind of year the project will face. It is a classic operations research problem and involves tradeoffs between the objective of pumping water and the risk that too much will be taken. This operational problem is faced at the beginning of every water year beginning in the fall. A careful study of historic input flows from the Sacramento River in the fall and winter shows that it may be difficult to establish until late in January if the water year will likely be wet so as to allow higher levels of pumping. But a careful examination of SWP pumping capacity shows that the pumps must run at nearly maximum capacity for most of the year if export flows near 4 MAF are to be realized. Clearly, if the 73 average predicted by this model is near 4 MAF then we must assume that heavy pumping is

3

allowed during the fall and winter months before it is known that the year will indeed be wet. How is this reconciled with prudence and so call risk avoidance?

Because the model incorrectly deals with the statistical nature of the input hydrology it also includes some totally improper inputs. The model relies on a "water year index" which is a convolution of the spring and fall/winter runoffs across years. The affect is to produce an index which is uni-modal in contrast to the bi-modal hydrologic input. Because there is no significant year-to-year correlation in runoff, this convolution is without scientific merit and totally distorts the basic operational decision problem so that it no longer represents any reality. Furthermore, this water year index is further convoluted to a "water year type" designator that is used to establish Delta export/inflow ratios that ostensibly are used to protect the Delta environment.

The "water year type" is the index that is used in the CALSIM II model to establish what the required outflow in the Delta must be to satisfy the SWRCB rules. It is used in the model by a "lookup table" that predetermines the water year before it is fully developed. It does this by combining the previous spring's runoff with the current fall and/or winter runoff to decide whether the coming water year is going to be wet or dry. Needless to say, the statistical nature of the runoff record defies predicting what the upcoming water year will be. But by this simple mechanism the model is given fore knowledge of conditions before they are experienced. This departs radically from any notion of simulation. The convolution giving rise to this "water year type" has no demonstrable logical analysis for its existence. Clearly, the CALSIM II model cannot be taken as a valid model until some of these logical flaws are explained or corrected. By extension, the Reliability Report is without any scientific merit and is virtually useless for the purposes stated.

Additional Inconsistencies

There are additional problems that deserve explanation beyond what is stated in the Reliability Report. When one compares the set of tables documenting the past 10 years of deliveries to the various contractors and compares them to the same years reported in the 2002/2003 version there are some significant changes. Out of the ten years only one of the years appears to be the same in the two volumes. Most of the changes in deliveries seem to occur in the values reported for Kern Co. and Castaic Lake Water Agency. The latest report should explain these differences.

Sincerely,

Arve R. Sjovold

Plaintiff CPA Representative
In the Monterey Settlement
Negotiations

Plaintiff CPA Representative
To Monterey ++ EIR Comm.

4

ADDITIONAL DATA ON
OROVILLE STORAGE
1996-2004

By: Arve R. Sjovold
October 8, 2006

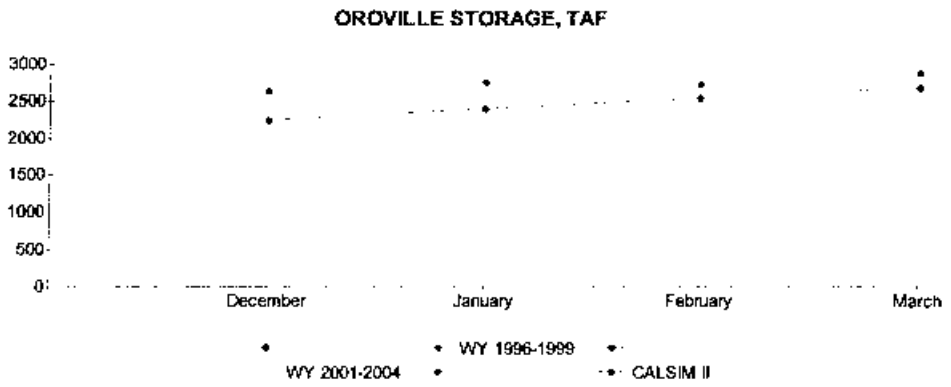
As part of my investigation on SWP pumping from the Delta and releases from Oroville, I also tabulated the corresponding data for Oroville storage. I divided the period into before water-year 2000 and after. This provides two sets to distinguish the changes in operations as a result of the new pumping regimen documented previously. I left out the year 2000 data as I considered it a transition year between the two regimens.

The results are presented in the table below and a corresponding chart. I plot the averages storage levels for the two periods, 1996-1999 and 2001-2004, for the months of December, January, February, and March. Each value represents the average of the four period designated in the column head. A third entry is the estimates provide by the CALSIM II model as reported in a recent draft report from DWR.

I don't know what level is called for by their operational guidelines or any fishery constraints that may apply in these months. However, it is clear that to support the new regimen, it appears that Oroville storage levels will be systematically lower with the new regimen than before. It is also noteworthy that the new regimen levels are systematically lower than the CALSIM II prediction. This may be important to the FERC licensing process now going on.

Month	WY 1996-1999	WY 2001-2004	CALSIM II
December	2636	1798	2250
January	2758	2067	2400
February	2728	2271	2550
March	2886	2541	2700

5


OROVILLE STORAGE, TAF
3000
2500
2000
1500
1000
500
0
December
January
February
March
WY 1996-1999
WY 2001-2004
CALSIM II

6

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December 22, 2005

ENV-28
attachment
#6
(20 pgs)

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California Department of Water Resources
Bay Delta Office Chief
1416, 9th Street, Room 215-37
Sacramento, CA 95814

California Department of Water Resources
SWP Delivery Reliability Report – Attn: Johnnie Young-Craig
P.O. Box 942836
Sacramento, CA 94236-0001

via facsimile to: (916) 653-6077
via email to: Comments-on-2005DRR@water.ca.gov

Re: Comments on Public Review Draft of the State Water Project Delivery Reliability Report 2005

Ms. Kelly:

The Planning and Conservation League (PCL), a strong advocate for accurate and realistic water supply planning, submits the following comments on DWR's Public Review Draft of the State Water Project Delivery Reliability Report (Draft Reliability Report). As one of the signatories to the court-approved settlement agreement requiring DWR to prepare these biennial reliability reports, PCL seeks to ensure that the final report lives up to the rigorous reporting requirements specified in that agreement. Serious deficiencies are present in the Draft Report that, if left uncorrected, would dangerously overestimate DWR's future ability to deliver water and compound the risk that local planning decisions will be predicated on "paper" rather than deliverable water.

The Reliability Report Should Accurately Disclose its Foundation in the Settlement Agreement and the State Water Project Contracts

The present Draft fails to inform local decision-makers and the public of the context and history behind DWR's reporting requirement. DWR's legal duty to prepare biennial reliability reports arises from the court-approved settlement agreement executed by PCL, DWR, state water contractors and other entities in the wake of the Third District Court of Appeal's ruling in the "Monterey Amendments" case, *Planning & Conservation League v. Department of Water Resources* (2000) 83 Cal. App. 4th 892.

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In *Planning & Conservation League*, the decision invalidating the Monterey Amendments EIR, the court bluntly addressed the "huge gap" between the 4.23 million acre-feet of SWP entitlements referenced in Table A of the SWP contracts and the half or less of that amount the state can reliably deliver. Recognizing the practical consequences of paper water for local development decisions, that court vindicated "the commonsense notion that land use decisions are predicated at some level on assumptions about available water supply. The Court also recognized that reliance on "paper water in local development decisions can produce excessive groundwater pumping and a host of other detrimental environmental consequences. " (83 Cal. App. 4th at p. 915.)

In the settlement decision following that ruling, DWR expressly agreed to add a rigorous new set of reporting requirements. In a new provision (Article 58) of the SWP contract, DWR committed to the following:

> 1.Commencing in 2003, and every two years thereafter, the Department Water of Resources (DWR) shall prepare and deliver to all State Water Project (SWP) contractors, all city and county planning departments, and all regional and metropolitan planning departments within the project service area a report which accurately sets forth, under a range of hydrologic conditions, the then existing overall delivery capability of the project facilities and the allocation of that capacity to each contractor. The range of hydrologic conditions shall include the historic extended dry cycle and long-term average. The biennial report shall also disclose, for each of the ten years immediately preceding the report, the total amount of project water delivered and the amount of project water delivered to each contractor. The information presented in each report shall be presented in a manner readily understandable by the public. (Settlement Agreement Attachment B)

The Settlement Agreement further states:

> 3. DWR shall provide assistance to enable all Municipal and Industrial Contractors to provide complete and accurate information to relevant land-use planning agencies to assure that local land-use decisions reflect accurate information on the availability of water from state, local, and other sources. (Settlement Agreement Attachment B)

The Draft Reliability Report does not fulfill these requirements. As detailed in the remaining sections of these comments, the Draft omits important information and misinterprets data, which would mislead both the public and local water agencies. Accordingly, it lacks the accuracy that the settlement agreement requires. In order to help DWR meet the commitments made under the settlement agreement, we submit the following comments for inclusion in the final 2005 Reliability Report.

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Excerpts of the Reliability Report should not have been privately shared with the State Water Contractors, but denied to PCL and the public

We are aware that DWR provided an earlier draft chapter of the Draft Reliability Report to State Water Project contractors in May 2005 ("Excerpts from Working Draft 2005 SWP Delivery Reliability Report") and further recommended that local agencies incorporate information provided in that draft chapter in their Urban Water Management Plans (UWMPs). Castaic Lake Water Agency has acknowledged relying on that document in reviewing other projects, and other contractors may have done so as well. However, DWR did not provide that draft chapter to PCL or the public, even though PCL staff requested the opportunity to review the draft. After followup requests, we were informed that the draft chapter would be posted to a web page for contractor announcements. There was no public announcement informing interested parties of the availability of the draft chapter.

DWR's decision to circulate part of the report to the contractors, while denying that same document to PCL and members of the public, represents an unfortunate throwback to the defective process singled out for criticism in *Planning and Conservation League*, where the court took notice of the interested parties and members of the public who were "not invited to the table." (83 Cal. App. 4th at 905.)

The draft and final Reliability Reports should be available to the public prior to deadlines for local agency Urban Water Management Plans

The most important purpose of the Reliability Report is to provide local water agencies and the public with accurate and realistic information on the reliability of SWP deliveries. Those local agencies should be able to use that information in planning documents and to inform land use decisions. Unfortunately, the timing of this report significantly compromises its utility. DWR did not release its draft to the public until just weeks prior to the state mandated deadline for local water agencies to complete and submit their 2005 Urban Water Management Plans.

DWR's decision to provide a single draft chapter prior to release of the full draft significantly compromises the information now included in many UWMPs. Without the complete report and the benefit of public review, decision-makers, planners and the public were denied the opportunity to evaluate and confirm the credibility of the information included in the draft chapter and now included in the UWMPs. Releasing the draft chapter and significantly delaying the release of this report is functionally equivalent to eliminating public oversight and transparency.

Water supply information from one chapter of a draft report also does not provide an adequate level of certainty or rigorous review required to determine the reliability of future water supplies for millions of Californians. To avoid damaging that review, water agencies and the public were supposed to have the complete final report, not just a preliminary part of it.

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DWR must ensure that in the future, the public will have ample opportunity to review and comment on Draft Reliability Reports, and that those public comments will be appropriately responded to and incorporated into vetted and substantiated final future reports well before Urban Water Management Plans are due to the State.

The Reliability Report should include DWR's analysis of SWP reliability under anticipated effects of climate change.

The 2005 Draft Reliability Report recognizes that a primary factor in determining reliability of SWP supplies is the availability of water in source areas. Yet the Draft Report fails to discuss and incorporate known and recognized information regarding the substantial adverse impacts climate change will have upon California's water supply. This omission is particularly troubling because DWR previously committed to including such information.

In 2002 DWR's first Reliability Report recognized that climate change could significantly alter availability of water in source areas. The 2002 report stated that information on climate change impacts to California was being developed in the California Water Plan Update process, and that such information would be incorporated into the 2005 reliability report. The California Water Plan Update 2005 is now nearly complete, and it contains information on climate change. The April 7, 2005 draft of the Water Plan Update states:

> California's relies on snowpack as its largest means of annual water storage. Runoff from the Sierra Nevada mountains during April through July of each year averages 14 million acre-feet and comes primarily from snowmelt. Computer modeling of global climate change scenarios predict significant future reductions in the Sierra snowpack. A reduced snowpack will reduce the total water storage for the state. Figure 4-7 (Model simulation of potential changes in snowpack during the 21st Century) shows a 52 percent reduction in the annual April through July runoff for a 2.1 degree C (3.8 F) of warming, well within the 1.4 to 5.8 degree C (2.5–10.4 F) range predicted by global climate models for this century.
>
> Changes in the timing of snowfall and snowmelt, as a result of climate change, may make it more difficult to refill reservoir flood control space during late spring and early summer, potentially reducing the amount of surface water available during the dry season. Changes in reservoir levels also affect lake recreation, hydroelectric power production, and fish habitat by altering water temperatures and quality. Reductions in snowpack may require changes in the operation of California's water systems and infrastructure, and increase the value of additional flood control space in reservoirs.
> (Public Review Draft California Water Plan Update, April 7, 2005, Vol. 4, page 4-27)

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Despite the commitments made in the 2002 Reliability Report, this information is not included in the recent draft of the 2005 Delivery Reliability Report.

In addition, the Draft Reliability Report misleads readers by suggesting that information on climate change impacts in California is not available. Since the release of the Draft Reliability Report 2002, a large amount of analysis on potential climate change impacts on water management in California has been published. Yet, the Draft Report 2005 states:

> The studies do not incorporate any modifications to account for changes related to climate change or assess the risk of future seismic or flooding events significantly disrupting SWP deliveries. As tools are developed to address these risks and the resulting studies become available, the information will be incorporated into the assessment of SWP delivery reliability. The results of the CalSim-II studies conducted for this update to *The State Water Project Delivery Reliability Report 2002* (DWR 2003b) represent the best available assessment of the delivery capability of the SWP. (Draft Reliability Report page 17)

However, estimates of the deliveries from the SWP under climate change conditions have been modeled and analyzed. The California Energy Commission recently completed such an analysis in their report, "Predictions of Climate Change Impacts on California Water Resources Using CalSim-II: A Technical Note" (CEC report).

In contrast to the statement included in the Draft Reliability Report, the CEC report provides assessments of SWP delivery capability under several probable climate change scenarios. This work was prepared in response to Executive Order S-3-05 issued by Governor Schwarzenegger, which called for a report on the impacts to California of global warming, including impacts to water supply, public health, agriculture, the coastline, and forestry.

It includes analysis carried out using CalSim-II, some of it performed by DWR staff.
It is disappointing that it took the initiative of the Energy Commission to generate climate change scenarios that PCL has been requesting of DWR for over two years. Moreover, DWR cannot credibly represent that such studies are impossible even after they become publicly available. To claim otherwise would fatally compromise the commitment to accuracy that is the hallmark of DWR's reporting requirement.

The figures below from the CEC Report show that under climate change hydrologies, SWP deliveries at 75% reliability could be as much as 1.9 million acre feet less than the base condition.

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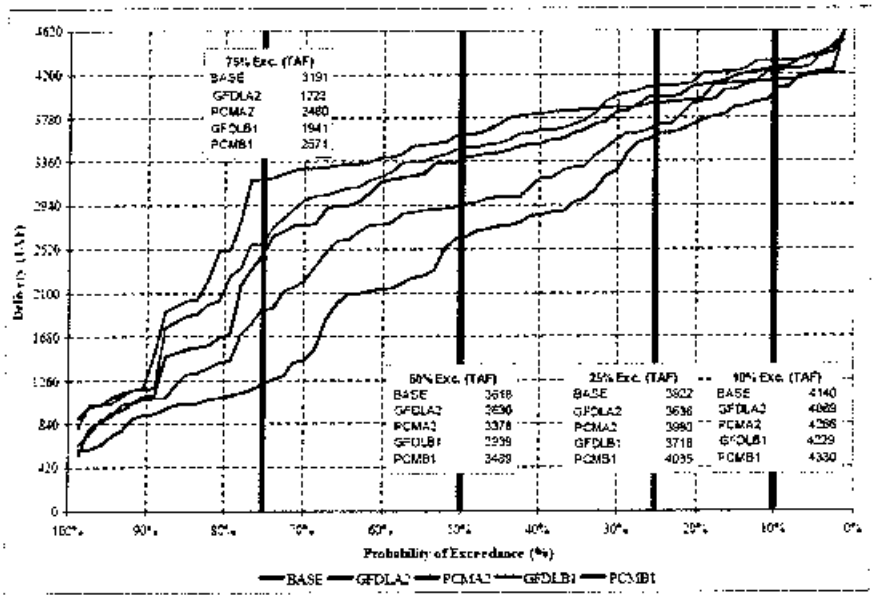

Figure 7. Exceedance probability plot of SWP Annual Deliveries under climate change scenarios PCM B1-A2 and GFDL B1-A2 for 2070-2099

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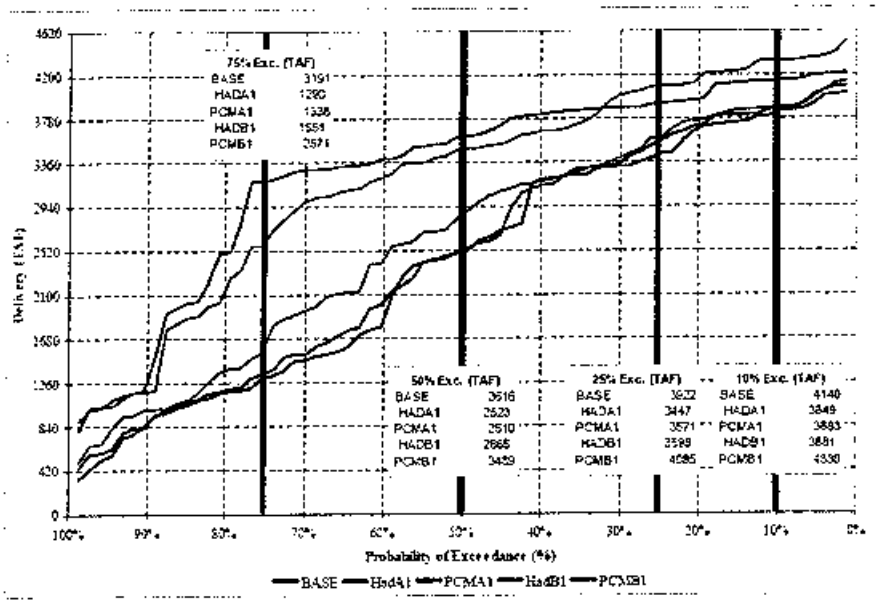

Figure 8. Exceedance probability plot of SWP Annual Deliveries under climate change scenarios PCM B1-A1 and HadCM3 B1-A1 for 2070-2099

(California Energy Commission, draft Predictions of Climate Change Impacts on California Water Resources Using CalSim-II: A Technical Note, December 2005 page 14 & 15 http://www.energy.ca.gov/2005publications/CEC-500-2005-200/CEC-500-2005-200-SD.PDF)

The CEC report concluded that modeling, "results show great negative impacts on California hydrology and water resources associated with most of climate change scenarios analyzed (only one scenario PCM run under B1 emission scenarios show just mild negative impacts)." (page 4)

This information demonstrates the range of outcomes that water managers must be prepared to address. This important assessment of the delivery capability of the SWP should be included in the Draft Reliability Report.

We also understand that DWR may have done its own analysis of the impacts of climate change on SWP deliveries. On the official State of California Climate Change Portal (http://www.climatechange.ca.gov/climate_action_team/reports/index.html) there is a reference to a study done by DWR. However unlike all of the other references, no results are included. The Reliability Report should include the results of DWR's own analysis.

Omission of this information prevents planners and decision makers from preparing for the inevitable implications for their water supplies. If the CEC already is predicting that water

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availability, and thus SWP deliveries, will be substantially reduced in the near future, water planners must adjust to that reality. DWR must address this problem, and will do California an enormous disservice if it continues to pretend that this problem does not exist.

Information in the Reliability Report will be used by local planners to make infrastructure investments and development decisions. The decisions made today about where to place infrastructure and where to approve development are long term commitments that will have impacts for hundreds of years into the future.

For instance, local decision-makers may chose not to place purple pipe in new development on the basis of assumed high level of delivery reliability from the SWP. Instead, decision-makers could choose to invest in new infrastructure to provide traditional supplies, including SWP supplies to new development. Once development is approved, the local area has foregone the opportunity to increase water supply reliability through use of recycled water. Should SWP supplies become significantly lower than predicted in the Reliability Report due to foreseeable impacts of climate change, significant local and statewide investments in infrastructure and housing would be stranded.

If local decisions are predicated on information from DWR that does not fully acknowledge potential constraints on DWR deliveries, they run the risk of producing excessive groundwater pumping and a host of other detrimental environmental consequences " (See *Planning and Conservation League*, 83 Cal. App. 4th at p. 915.)]

The long term nature and the resulting implications for the future of local areas as well as California as a whole, demand that the Reliability Report provide accurate, realistic information that fully discloses foreseeable uncertainty and risks.

The Report's unreliability also creates financial risks for the state. In many cases bonds will be committed to infrastructure built on expectations generated or encouraged by the Reliability Report. As with any financial investment, the risks associated with these investments must be fully disclosed to those who buy the bonds, those who approved the bonds, and those who invest in that infrastructure or in the developments supported by that infrastructure. As the state has learned in the past with levee liability, there is a potential risk that the State may be held accountable for decisions and investments made by others on the basis of false interpretation of the State's ability to protect and guarantee those investments.

The Reliability Report should include risk analysis and impacts from catastrophic failure in the Bay Delta Estuary from earthquake or flood

The Draft Reliability Report correctly identifies the availability and means of conveyance as a primary factor in determining reliability of SWP supplies. However, like climate change impacts, the Draft Report fails to include analysis or discussion of serious and eminent risks to the Bay Delta

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Estuary, an essential component of the SWP conveyance system. Significant risks to the ability of the SWP to export water from the Bay Delta Estuary are posed by the vulnerability of levees to flood, sea level rise and earthquake, as well as environmental degradation and continued declines of important fish species.

Dr. Jeffery Mount from the University of California, Davis, recently completed a risk analysis estimating that there is a 64 percent probability that the Bay Delta Estuary will experience abrupt changes resulting from flooding or seismic activity within the next fifty years. These changes would permanently alter the hydrology, water quality and ecosystem of the Estuary. Furthermore, Dr. Mount found that there is no institutional capacity to address these permanent changes. (Subsidence, Seismicity and Sea Level Rise: Hell AND High Water in the Delta; presented by Dr. Jeffery Mount to the California Bay-Delta Authority October 14, 2004. http://calwater.ca.gov/CBDA/AgendaItems_10-13-14-04/Presentation/Item_13_6_Subsidence_Seismicity_Sea_Level_Rise.pdf)

In recent testimony to a joint committee of the California Legislature, Lester Snow, Director of DWR, outlined the serious risks to SWP water supply availability associated with Bay Delta levee failure. In his presentation, "How a Delta Earthquake Could Devastate California's Economy," Director Snow stated that extended impacts to water availability would include:

- Using most optimistic projection, levee repairs will require at least 15 months. More realistically, the repairs will take much longer.
- Southern California water agencies are drawing from reserves. Some will last up to 36 months; others will go dry sooner.
- Extreme water conservation measures enacted
- Ground water basins drawn dangerously down – may lead to contamination
- Water conservation and transfer programs enacted

(Slide 16 of Lester Snow's presentation to the joint legislative committee, November 1, 2005 http://www.publicaffairs.water.ca.gov/newsreleases/2005/11-01-05DeltaEarthquake.pdf)

Director Snow further indicated that recovery of the conveyance through the Delta could be abandoned. (Slide 19 of Lester Snow's presentation). Director Snow told the Legislature that "… we also need to recognize the Statewide impacts …if Delta water supplies are reduced or eliminated as a result of a catastrophic failure of our levee system." (Quote taken from DWR Press Release, November 1, 2005, http://www.publicaffairs.water.ca.gov/newsreleases/2005/11-01-05flood.cfm)

Accordingly, the Reliability Report should incorporate Director Snow's recommendation to recognize the risk to SWP reliability from flood, sea level rise and earthquake.

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In addition to vulnerable levees, ecosystem degradation poses a significant risk to the ability to convey SWP water reliably through the Bay Delta Estuary. Recently, data from the Department of Fish & Game's Fall Mid Water Trawl signaled that there is a serious ecosystem collapse in the Estuary, with four important pelagic fish populations at historic lows, including the California and Federally Endangered Species Act listed Delta Smelt.

In response, many agencies, including DWR are participating in an emergency science review called the 'Pelagic Organism Decline' (POD) investigation. The most recent report from the POD investigations indicates that increased exports, which increase fish entrainment and decrease available habitat, may be a primary contributor to the fisheries declines ("Interagency Ecological Program Synthesis of 2005 Work to Evaluate the Pelagic Organism Decline (POD) in the Upper San Francisco Estuary," November 2005 http://science.calwater.ca.gov/pdf/workshops/IEP_POD_2005WorkSynthesis-draft_111405.pdf).

The final Reliability Report should acknowledge the current pelagic organism decline and disclose the possibility that decreases in exports may be necessary in order to reverse those declines. Lastly, while the pelagic species decline currently is the most salient of the Bay-Delta Estuary's environmental problems, it is not the only problem that might compel delivery reductions. Bay-Delta water currently does not meet federal or state water quality standards, and many other species are listed as threatened or endangered. The final Reliability Report should acknowledge that fixing these other environmental problems also may require export reductions.

The Reliability Report should evaluate variable levels of demand, utilizing demand modeled in the Draft California Water Plan Update 2005

The Draft Reliability Report identifies the level and pattern of water demand in the delivery service area as the third primary component in determining SWP reliability. However, the Draft Reliability Report does not examine a significantly varied range of possible demand scenarios for the future. That omission is important, for such analysis would likely show that reliability is inversely proportional to California's overall level of demand.

Recent work completed by DWR for the California Water Plan provides a range of demand scenarios that should be included in the Reliability Report. The California Water Plan Update 2005 identifies three plausible demand scenarios: current trends continued; less resource intensive; and more resource intensive. Two of these three scenarios demonstrate that it is plausible that in 2030 California water demands will *decrease*, even with an expected 12 million more residents. The greatest decreases in water demands in every scenario occur in the SWP service area of Tulare Lake.

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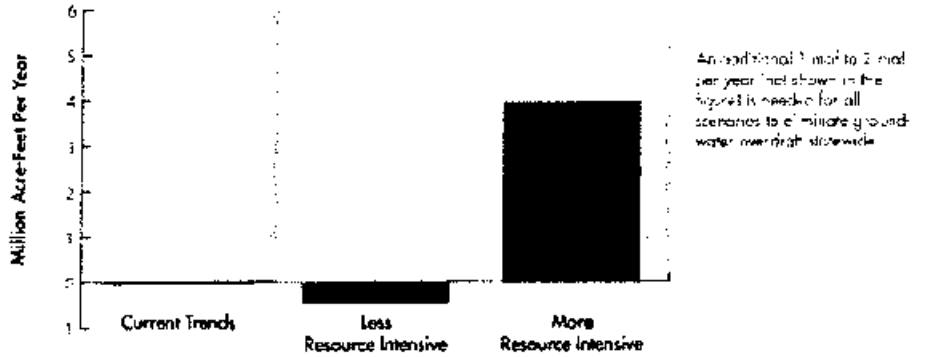
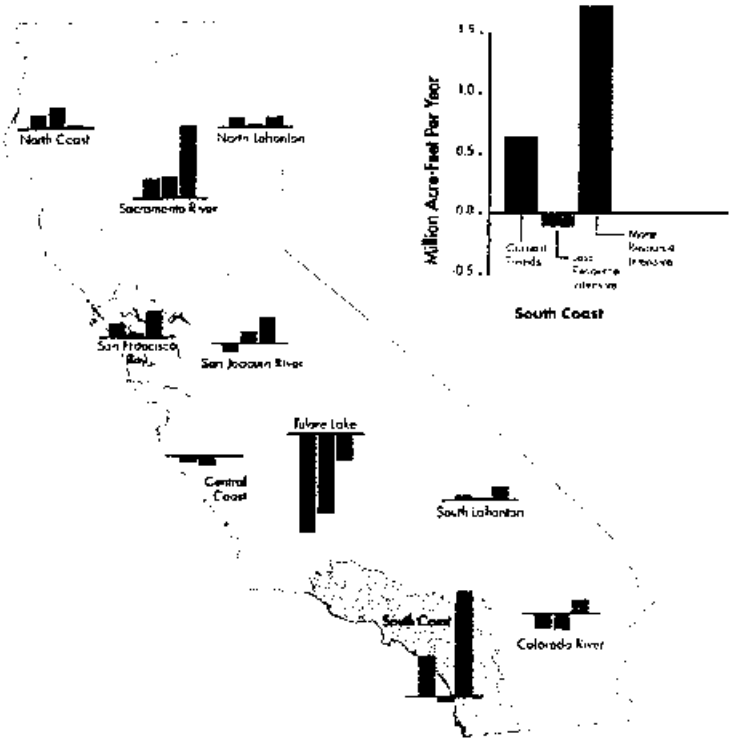
Figure 4-2 Net changes statewide in average-year water demand for baseline scenarios, 2000–2030



Water demands may change between 2000 and 2030 for average water conditions. Statewide water demand changes are shown for three baseline scenarios.

http://www.waterplan.water.ca.gov/docs/meeting_materials/ac/12.09.05/Changes_to_PRD_Slides_(12-08-2005).pdf



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Recently, the California Court of Appeals determined that state and Federal water agencies erred when they failed to adequately assess a range of reasonable scenarios in the CALFED ROD EIR in part because the environmental document did not include an analysis of reduced pumping from the Bay Delta Estuary (*In Re Bay Delta Programmatic Environmental Impact Report Coordinated Cases* (2005) 133 Cal.App.4th 154). Consistent with this finding, and DWR's recent good work on the State Water Plan Update, the Reliability Report should evaluate reliability under the three demand scenarios presented in the California Water Plan Update.

The Reliability Report should be consistent with operations described in environmental reviews

The Draft Reliability Report assumes that SWP deliveries into the future will be much higher than historic averages. In the past, SWP deliveries have averaged about 2 maf per year, while the Draft Reliability Report proposes that future deliveries will average from 2.8 to 3.1 maf annually. The Draft Reliability Report also assumes that an additional maximum of 1.11 maf of water could be delivered under Article 21.

Because CalSim-II is an optimization model that does not necessarily reflect options available to water operators, it may predict these levels of exports. However, federal and state water quality and endangered species laws and regulations probably would prohibit such high export levels for water quality problems and if species impacts were chronic even at historic levels. In light of the recent pelagic organism declines in the Bay Delta Estuary, it is prudent to ensure the Draft Reliability delivery predictions would not violate conditions of the Federal Clean Water Act, the Federal or California Endangered Species Acts, or any other environmental permit condition, regulation, standard, or law.

In order to ensure that stated water deliveries would be legally feasible, the Reliability Report must explicitly state whether listed export levels are consistent with those modeled in environmental reviews, including the recently issued biological opinions. For instance, the Reliability Report should state whether the Biological Opinions for OCAP in 2004 accounted for impacts to listed species under a modeling scenario that contemplated deliveries of 1.11 million acre feet of Article 21 water.

The Reliability Report should not recommend that water agencies integrate Article 21 as firm annual supplies in planning documents

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Article 21 water is by definition interruptible water; indeed, the word "interruptible" replaces the formerly used "surplus" in the Monterey Amendments. It should not be used as the basis for uninterruptible demands. Yet in chapter 6 of the Draft Reliability Report, local agencies are encouraged to include Article 21 water in a table of average annual values.

As DWR is aware, water supplies accounted for in the Urban Water Management Plans become the basis for approval of water supply assessments for new development in California. It is not only imprudent, but would provide institutional cover for unreliable planning, to recommend that local decision-makers approve housing that will be dependent on water that is 'interruptible.'

Article 21 water should be removed from the recommended table of average annual deliveries.

Use of CalSim-II as the sole tool to determine reliability is inappropriate given the following significant and yet to be resolved deficiencies

The lack of calibration and other deficiencies of CalSim-II have been made known the DWR in formal comments on the 2002 Draft by several parties, specifically Arve Sjovold and Dennis O'Conner. In addition, a 2003 expert peer review report documented numerous problems in CalSim II, and concluded that its predictions should be treated as "hypotheses." A. Close et al., A Strategic Review of CalSim II and its User for Water Planning, Management and Operations in California 13 (2003). This Draft has not adequately addressed those deficiencies. Some of these previously-highlighted deficiencies are listed below.

- CalSim-II has not been calibrated or validated
- It is unclear whether CalSim-II incorporates limitations to groundwater use in the Sacramento Valley
- The CalSim-II model should not be used to make absolute predictions, such as those incorporated into the Reliability Report
- CalSim-II does not recognize or report uncertainty

Additionally, CalSim-II may produce results not consistent with reality, replacing the problem of paper water with an even greater problem of 'cyber water.' For example, in 2001, California experienced water supply associated with approximately the 75% exceedence level, and the State Water Project was able to deliver 1,607,570 ac-ft. However, the CalSim-II simulations predicted a 75% exceedence level of supply of roughly 2,500,000 ac-ft (as read from Figure 5.1). In other words, CalSim-II overpredicted deliveries by more than 50%. These discrepancies demonstrate the need to use multiple tools to determine reliability, as well as the need to articulate limitations of this particular model. Similarly, they demonstrate that local agencies will take enormous risks if they approve projects in reliance on CalSim II's predictions that future deliveries will be substantially higher than historic deliveries.

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The Draft Reliability Report attempts to respond to the recent to the recommendations and conclusions from the recent CBDA Peer Review, *A Strategic Review of CalSim II and its Uses for Water Planning, Management, and Operations in Central California* (Close and others 2003).

The Draft Reliability Report states:

> In *Peer Review Response,* DWR and USBR (2004) conclude the concern about overestimations of south-of-Delta deliveries is unwarranted because the 73-year study referenced by the panel is not designed to mimic historical conditions; rather it is intended to determine the reliability of the SWP when the demand equals the maximum Delta Table A amount (4.133 MAF) every year. The results of the referenced study are documented in *The SWP Delivery Reliability Report 2002*
> (DWR 2003b) as study 3 (2021B).
>
> A more appropriate method for assessing the ability of CalSim II to accurately model SWP operations is to compare the historical SWP deliveries with the simulated deliveries of the Historical Operations Study. DWR committed to conducting this study in *The SWP Delivery Reliability Report 2002* (DWR 2003b). The study is documented in the November 2003 Technical Memorandum Report *CalSim-II Simulation of Historical SWP/CVP Operations* (DWR 2003a). The Historical Operations Study is designed to assess CalSim II's ability to mimic historical operations of the SWP. In this study, historical input is used where reliable data are available. In situations where reliable historical record is not readily available, reasonable assumptions and estimates are made. (pages 10 & 11)

Before stating that this approach is the most appropriate response to the Peer Review concerns, DWR should reconvene the panel in order to review whether DWR's response satisfies the concerns raised in the original peer review. To verify that this response appropriately satisfies the concerns raised by that panel.

Additional specific comments on uses of CalSim-II in the Draft Reliability Report 2005 are attached in Appendix A.

Conclusion

PCL hopes that these comments assist DWR in arriving at a final version of the Reliability Report that corrects the serious deficiencies identified in the draft, and provides the

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additional analysis recommended here. Without these additional efforts, the report would not fulfill DWR's responsibilities under the settlement agreement and the Article 58 of the SWP contracts, and would fail to provide local decision-makers with a credible basis to ensure that development decisions are grounded in an accurate assessment of deliverable SWP supply.

Sincerely,

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Senator Ducheny
Senator Perata
Assemblywoman Wolk
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APPENDIX A: **Specific comments on uses of CalSim-II in this Draft Reliability Report are highlighted below.**

Page 7: "Whatever assumptions are made, every responsible water delivery reliability analysis should expressly state the assumptions, methods and data used to produce its results. It should also be understood that those numbers depend on, and are no better then, the assumptions upon which they must necessarily rest."

This statement is entirely true. Yet this particular "water delivery reliability analysis" does not measure up to its own standard, because it does not adequately disclose the weaknesses of the key assumptions it makes and the key model upon which it relies. The reliability report should acknowledge that the simulated levels of SWP deliveries reported on the Draft Reliability Report are defined entirely by the explicit and implicit assumptions used in CalSim-II—they are CalSim-II's reliability results and not the results for the physical system itself—and should address the potential weaknesses in the "assumptions, methods and data" used to make those predictions.

Additionally, a statement such as this is so important that it should be made prominently, perhaps in a highlighted text box, rather than at the end of a paragraph in the body of the report.

Page 7: "For example, the demand 30 years ago for the SWP was not as high as it is currently or expected to be in the future. Because the need for SWP water then was relatively low, less water was exported through the SWP during normal and wet times then could have been if the demand had been higher. Simply put, less water was delivered because less water was needed."

The implicit assumption in this statement that there was no logic for contractors to take the water they were entitled to under Table A because 1) they had no need for it at that time, and 2) they had no place to store it for later use. If the assumption is that now and into the future the contractors will want to take delivery of their full Table A amounts—in other words, that circumstances have changed—then one or both of two conditions must be true 1) they need it and/or 2) they can store it. The reliability report should substantiate its reasons for assuming such a change in conditions.

On page 15, the Draft Reliability Report states that studies 4 and 5 were developed in discussions with SWP contractors and stakeholders involved with the development of the analysis associated with the environmental documentation for the Monterey Agreement. What analysis of current or future demand patterns and our available storage capacities is used to justify the assumption of a demand for the full Table A allotments? What are the assumptions about population growth, water use rates, availability of non-SWP supplies and available local storage capacity that lead to the conclusion that contractors will consistently ask for full Table A allotments?

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Page 7: "Conversely, the current or projected delivery capability of the a water project would be less if (1) demand for water from a water project was at its maximum level for many years, (2) no new facilities were built, and (3) the supply of the main sources of water was recently reduced because another entity with a prior water right increased its use of that source."

This statement is unclear and counterintuitive. The Draft Reliability Report often argues that higher levels of demand will increase the delivery capability not decrease it. DWR should clarify the point it is trying to make here or eliminate this statement altogether.

Page 8: "In the 2002 Reliability Report, the Department committed to conducting a comprehensive sensitivity analysis for assumptions contained in the CalSim-II model studies. This analysis is complete."

While this analysis is reported on in the Draft Reliability Report, DWR has made no attempt to use the results of that analysis to comment on the results of the CalSim-II modeling conducted for the reliability investigation. This seems to defeat the purpose of conducting and reporting on the sensitivity analysis. An attempt to consider the implications of the sensitivity analysis is included later in these comments.

Page 11: "The simulated deliveries in Figure 3-1 were adjusted for any differences between the historical and simulated carry-over storage in the SWP system reservoirs, Lake Oroville and SWP's portion of San Luis Reservoir."
Page 74 "(in Appendix E dealing with the Historical SWP/CVP Operations Simulation Technical Memorandum: Simulations of historically wet years, when the system was not supply constrained, may therefore be a poor indicator of the model's ability to accurately simulate future levels of development. Particular interest is therefore place on model results during the six-year drought of 1987-1992."

The Draft Reliability Report appears to offers up the Technical Memorandum Report entitled *CalSim-II Simulation of Historical SWP/CVP Operations* in order to support the legitimacy of the using CalSim-II to conduct the reliability analysis. If this is the goal then these two statements are problematic.

While the Draft Reliability Report gives no clear indication about what the adjustments referred to on page 11 entail, the fact that adjustments had to be made to generate the claimed correspondence shown in Figure 3-1 cannot stand without further explanation. The goal of the *CalSim-II Simulation of Historical SWP/CVP Operations* Technical Memorandum should have been to see if CalSim-II could be used to faithfully reproduce all aspects of system operations, not simply the SWP exports during the 1987-1992 drought. If the storage levels in SWP reservoirs were not faithfully reproduced and had to be adjusted in some unexplained way to generate the results in Figure 3-1, then the Technical Memorandum should not be used to build the creditability of the CalSim-II.

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In the same way, the comment in Appendix E that only the results for drought periods are critical for reliability analysis is not valid. The Technical Memorandum is being offered as support for the use of CalSim-II, not as a part of the reliability analysis itself. The claim that is being made is that the model faithfully replicated history and therefore has creditability in terms of simulating future conditions. The apparent recognition that the model did not do particularly well in normal and wet periods calls into question the validity of this claim.

In addition, even if CalSim II did accurately simulate deliveries in one past drought, that does not mean it can accurately simulate deliveries in a future drought, for constraints on the system are likely to be different. Water quality standards and endangered species protections have changed substantially since the 1987-02 drought, largely because the standards in place during that drought proved insufficiently protective. If the same drought conditions were to recur in the future, those heightened protections would likely prevent the SWP from exercising the same delivery capacity. CalSim II's predictions that those past diversions would be repeated therefore may prove the model's inadequacy rather than its credibility.

In keeping with the first comment, the inconclusive and somewhat opaque presentation of the *CalSim-II Simulation of Historical SWP/CVP Operations* Technical Memorandum results suggest that this report is about the reliability of SWP deliveries in the CalSim-II model and that the CalSim-II model is not a fully faithful representation of the how the system has been or presumably will be operated. Once again, it is fair to point out that if one wants to imagine future conditions then one must use some sort of model but the reader should not be left with the assumption that CalSim-II is a fully faithful representation of the system.

As an aside, Table 4 of the *CalSim-II Simulation of Historical SWP/CVP Operations* Technical Memorandum offers the most real, albeit limited, assessment of the reliability of the actual system if one is to assume that at some point in the future SWP contractors will consistently request their full Table A allotments. In 2001, contractors requested 4,124,126 ac-ft of SWP water and were allotted 1,607,570 ac-ft of supply. In 2003, contractors requested 4,126,929 ac-ft of SWP water and were allotted 3,714,233 ac-ft supply. These are two points on the exceedence curve of the real system reliability, certainly not enough to develop a robust reliability assessment. It is interesting to point out, however, that these delivery levels fall at roughly the 85% and 8% exceedence levels on the results for Study 4 that are meant to approximate current levels of development and demand (Figure 5.1). In terms of the hydrologic conditions 2001 and 2003 fall at approximately the 77% and 42% exceedence levels in terms of the Sacramento Valley water year index values for the period from 1922 to 1994 period simulated in CalSim-II. While far from a perfect metric for evaluating the performance of CalSim-II, this points out how the operations of the real system under roughly current conditions when nearly the full Table A amount was requested by the contractors compare with the simulated results.

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In terms of system reliability during dry periods, the most interesting conclusion to draw from this comparison is that actual operations in 2001, which benefited from a water supply associated with approximately the 75% exceedence level, provided a level of service of only 1,607,570 ac-ft while the CalSim-II simulations yielded a 75% exceedence level of supply of roughly 2,500,000 ac-ft (as read from Figure 5.1).

Page 16: "The Article 21 demand in the updated studies (4 and 5) is higher than the earlier studies for the December through March period."

It does not appear that DWR makes any attempt to explain why these higher levels were assumed. They are used in CalSim-II to prompt an export of water to SWP contractors when conditions warrant. While the Draft Reliability Report fairly comments on page 17 that "Incorporating supplies received under Article 21 into the assessment of water supply reliability is a local decision based on specific local circumstances, facts and level of water supply reliability required", including these numbers that are driven by a somewhat unjustified level of assumed Article 21 demand is not the clearest manner in which to present reliability analysis.

Page 25: "By referencing the curve for Study 5 in Figure 5-2, the following can be deduced":

- *In 75 percent of the years, the annuall delivery of the SWP is estimated to be at of above 2.7 maf per year (65 % of 4.13 maf).*

There is nothing special about the 75, 50 and 25% thresholds used in providing a narrative description of Figure 5.2 In fact it is equally valid to open and close the list of bullets with statements like:

- The maximum amount of water that can be delivered in response to full Table A demands with 100 percent reliability, in the CalSim-II model, is 187,000 ac-ft.
- Under the least supply constricted conditions the SWP will be able to deliver, in the CalSim-II model, the full Table A allotments.

Without even worrying about whether or not the assumptions used in the CalSim-II model are valid or not, these two statements are as valid as the three offered by DWR and they create a much different impression of SWP reliability.

Even if 100% reliability is not a valid standard, water utility plans for a system that will fail 25% of the time, as is the corollary of the 75% exceedence, are no more valid. Municipal utilities are often looking for, 90-95% reliability. According to these standards, Figure 5-2 suggests that the reliability of the system is between 1.4 maf and 0.8 maf. These numbers, which are no more or less valid than those reported by DWR, are perhaps more useful for water managers in assessing the reliability of a water supply.

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Page 26: "In the case of 1977, it is reasonable to assume that up to 500 taf of 1976 allocated Table A water could be carried over to 1977."

This sort of conditional post-processing of model output, which could have ripple effect across the rest of the simulation with potential changes in model results, is not valid and this whole section should be removed. To its credit DWR does not try and use any of this after the fact hand waving in the Table and Figures published in the Draft Reliability Report. Nonetheless, by including this narrative DWR is attempting to argue both that the model can be trusted and that the model cannot be trusted. This is not legitimate model interpretation.

Page 49: "The estimate could be viewed as too low because the Department of Water Resources (DWR) is planning to have facilities in place by 2025 that will increase the reliability of the SWP. The estimate could be viewed as too high because there is the potential for exports to be required to be reduced to protect endangered fish species."

It is inappropriate to speculate on what deliveries could be with new facilities when the information is to be used under the provisions of Senate Bill 221 to verify that water supplies are available for new developments.

Page 78: "Table E-1 Summary of the Expected Elasticity Index (EI) and Sensitivity Index (SI) for Selected Variables."

These very interesting results are included in the Draft Reliability Report and are then ignored completely interpreting the results of the reliability analysis. Let us for example attempt to recast the statement offered above:

- The maximum amount of water that can be delivered in response to full Table A demands with 100 percent reliability, according to the CalSim-II model, is 187,000 ac-ft.

If the sensitivity analysis is valid, it is legitimate to make the following statements.

- If the assumed levels of Banks Pumping vary by ±10% relative to the base level assumed in the CalSim-II simulation, then the maximum amount of water that be delivered in response to full Table A demands with 100 percent reliability, in the CalSim-II model, will very between 184,195 and 189,805 ac-ft.
- If the assumed levels of Oroville inflows vary by ±10% relative to the base level assumed in the CalSim-II simulation, then the maximum amount of water that can be delivered in response to full Table A demands with 100 percent reliability, according to the CalSim-II model, will very between 182,138 and 191,862 ac-ft.

DWR should either make these sorts of statements or they should not attempt to use the results of the sensitivity analysis to assert the legitimacy of the use of CalSim-II for SWP reliability analysis.

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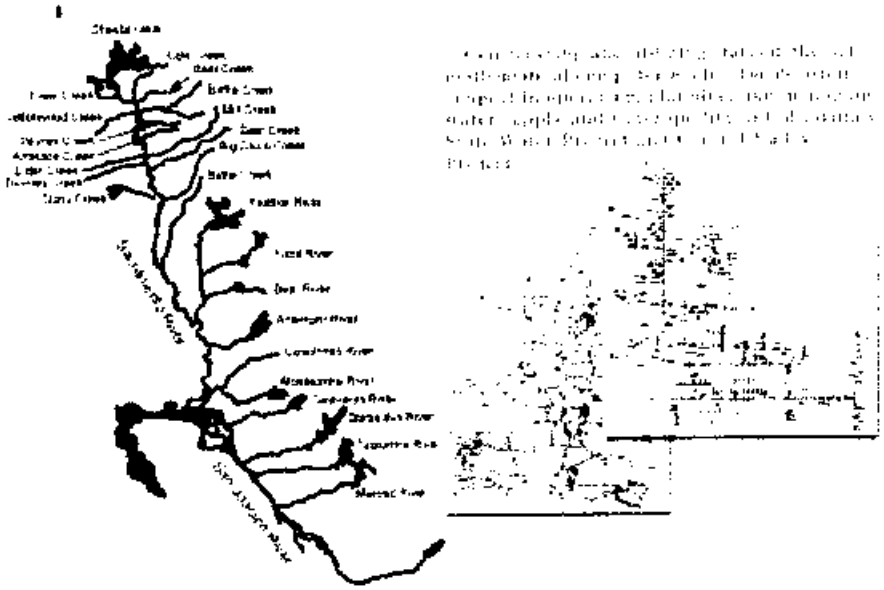
A Strategic Review of CALSIM II and its Use for Water Planning, Management, and Operations in Central California



Submitted to the

California Bay Delta Authority Science Program
Association of Bay Governments
Oakland, California

by

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December 4, 2003

Executive Summary

1. Summary

The central all-encompassing question put to the panel is whether the CALFED program has adopted an appropriate approach to modeling the CVP-SWP-Central Valley system. Is the general CALSIM modeling approach appropriate for predicting the performance of the general facilities and for use in allocation planning, assessing water supply reliabilities and for carrying out operational studies? We believe the use of an optimization engine for simulating the hydrology and for making allocation decisions is an appropriate approach and is in fact the approach many serious efforts of this kind are using. It is a substantial improvement of the previous modeling approaches and provides a basis for consensus among federal and state interests. The modeling approach addresses many of the complexities of the CVP-SWP system and its water management decisions.

There exists a common tension between those who wish for greater detail and those who want less detail from the model. This argues for a more comprehensive, modular and flexible approach than is now available. In this report we suggest some ways this might be accomplished in the future. We also propose some management procedures that could be considered to improve model and model application quality control and documentation. The openness and availability of the model is admirable and very important given the numerous stakeholders who have interests in the management and allocation of water in the state. To increase the public's confidence in the many components and features of CALSIM II, we suggest that these components of CALSIM be subjected to careful technical peer review by appropriate experts and stakeholders.

2. Background

The California Department of Water Resources (DWR) and the U.S. Bureau of Reclamation (USBR) have developed a computer model called CALSIM II that simulates much of the water resources infrastructure in the Central Valley of California and the Delta region. This infrastructure is referred to as the CVP-SWP system. In particular CALSIM II provides quantitative hydrologic-based information to those responsible for planning, managing and operating the State Water Project (SWP) and the federal Central Valley Project (CVP). As the official model of those projects, CALSIM II is the default system model for any inter-regional or statewide analysis of water in the Central Valley of California.

CALSIM II has a central role in the analysis of many CVP-SWP and related issues, some of which require capabilities beyond those included in the model. California needs a large-scale relatively versatile inter-regional operations planning model and CALSIM II currently serves that purpose reasonably well. As the primary State and Federal-sponsored model available for water operations and planning, CALSIM II is critical to the study of many technical and policy issues related to water supply reliability, environmental management and performance, water demands, economics, hydrology and climate, and regulatory compliance.

CALSIM II is a particular application of the California Water Resources Simulation Model called CALSIM. It uses a mixed integer linear programming model solver to route water through a network over time. Currently it uses monthly time steps. Policies and priorities are implemented through the use of user-defined weights applied to the flows in the system (represented by arcs of the network). Simulation cycles at different temporal scales allow for successive implementation of constraints. The model can simulate the operation of relatively complex environmental water accounts and state and federal environmental regulations. In our judgment CALSIM II represents a very impressive modeling effort on the part of all those involved with its development and application.

The CALFED Science Program commissioned this external review panel (Appendix D) to 1) provide an independent analysis and evaluation of the strengths and weaknesses of CALSIM and CALSIM II, and 2) to offer suggestions on the appropriate uses of these modeling tools, on ways their use might complement or be complemented by other models, and on further development, quality assurance, and use in major water systems operations and planning in California.

The panel received background documents (Appendix B), including a survey by the University of California at Davis of stakeholder responses to questions about CALSIM II. We subsequently met for one and a half days in Sacramento for discussions and presentations (Appendix A) by CALFED, DWR and USBR staff. The discussions concluded with a summary presentation by the panel outlining our tentative conclusions.

The information we received and the shortness of our meetings with modeling staff precluded a thorough technical analysis of CALSIM II. We believe such a technical review should be carried out. Only then will users of CALSIM II have some assurance as to the appropriateness of its assumptions and to the quality (accuracy) of its results. By necessity our review is more strategic. It offers some suggestions for establishing a more complete technical peer review, for managing the CALSIM II applications and for ensuring greater quality control over the model and its input data, and for increasing the quality of the model, the precision of its results, and their documentation.

In this review we were asked to address the following questions:

1. Is CALSIM a reasonable modeling approach for current and proposed applications and problems?
2. Do other modeling approaches show similar or greater promise and flexibility for such problems? If so, how?
3. What are the major comparative strengths and weaknesses of the current CALSIM approach and alternative approaches?
4. What are major scientific, technical, and institutional limitations, uncertainties, and impediments for current and proposed applications of CALSIM?
5. What model, software, and data developments, special studies or tests would be beneficial to improve CALSIM for current and proposed uses?
6. How might CALSIM development and applications be managed and overseen to improve the quality assurance of model results for current and proposed applications?

7. What are your suggestions for long-term use, development, or replacement of the current suite of models and data available for the current and proposed uses of CALSIM?

The following sections of this summary present our responses to these questions. The main parts of this report and its appendices provide additional detail.

3. CALSIM Modeling Approach

CALSIM II is a simulation model developed as a joint venture between the California Department of Water Resources (DWR) and the U.S. Bureau of Reclamation (USBR) to (i) provide a significant modernization and upgrading of the DWRSIM and PROSIM models developed and used by these organizations, (ii) develop a comprehensive modeling system that simultaneously addresses the current and future needs of both the SWP and CVP systems; and (iii) develop a generalized modeling system that could be applied in any river basin system, in contrast with the previous models that were less generalized and more specifically designed for the existing SWP and CVP systems. In this respect, CALSIM II represents a state-of-the-art modeling system that is similar in general concept, while differing in specific details, to other data-driven river basin modeling systems such as ARSP, MODSIM, OASIS, REALM, RiverWare and WEAP.

CALSIM uses linear programming to solve sets of equations that simulate water movement through the CVP-SWP system in accordance with various objectives and constraints. This is a modeling approach which has been used successful in California (Johnson et al., 1991). In a complex system such as that being modeled, it is essential to have some mathematical representation of system flows that reflects all of the interconnections and constraints. Use of an optimization algorithm allows good decisions to be identified from among all possible and feasible decisions. To the extent this simulates what actually occurs, it is a good modeling approach. To the extent it optimizes when in reality no such optimization is implemented, it has the potential to produce inaccurate and overly optimistic outputs.

Most successful applications of optimization that attempt to simulate the behavior of a system have calibrated their objective functions (i.e., set the weights that prioritize flows over time and space) so that the model results correspond to what actually happens or would happen under a particular hydrologic and demand scenario. In these cases the model's decisions correspond to those the operators would make, as often prescribed by rules that have been worked out in a legal/political process. It does not appear that such a calibration of the objective function weights in CALSIM has yet been completed.

4. Other Modeling Approaches

There are two aspects of modeling, the model structure and algorithms used, and the model software. The use of linear optimization algorithms to solve simultaneous equations for simulating hydrology is a common way of avoiding a typically long list of procedural rules for simulating regional water systems. Such sets of procedures can be difficult to generate for

complex systems, and very different and new rule sets may be needed if structural or significant policy changes are to be investigated. In addition the performance of the system when simulated will be less than that which can be achieved in practice if a good set of rules is not provided. Optimization models are generally easier to reformulate when system changes are to be investigated. However unless the optimization is calibrated in such a way as to actually resemble what takes place in practice it can produce an optimistic description of system performance. This is particularly true if the optimization model is allowed to have perfect foresight of future events that in practice would not be available to system operators.

Large simulation models using optimization and procedural rules both need to have internal checks to ensure to the extent possible that errors in mass balances, for example, do not occur due to errors made when the model is being defined or created. Such internal checking is not apparent to us in our admittedly brief review of CALSIM II. Nor were calibration procedures well defined.

One obvious limitation of using linear optimization procedures is its inability to model accurately and efficiently some of the non-linear hydrologic and decision processes that occur in systems as complex as the CVP-SWP. One approach to addressing this issue of model accuracy, and possibly for decreasing the computational time as well, is to link linear optimization models to non-linear simulation models in a way that permits the simulation to represent the hydrology in any spatial and temporal detail desired. The optimization is used to determine what the decisions should be at every site where a water allocation, reservoir release, or other management decisions must be made. The time steps for simulation could be daily, or weekly or longer, depending on the needs of the user, but would likely be of shorter durations than the optimization time steps. After a predetermined number of simulation time steps, the optimization model would be run. The initial state of the optimization should be set at the beginning of each optimization time step. The optimization component should include multiple future time periods, with imperfect hydrologic and demand forecasts, but once solved only the current period's solutions are implemented – i.e., these decision variable values are sent to the simulation component. The decisions indicated for future periods are ignored. When appropriate, the initial state of the multi-period optimization model is updated and the model is again solved. And so on. Such a modeling approach may prove to be both more realistic, more accurate, and require less time, once developed. We believe such an approach might be worth considering for future development.

CALSIM II currently consists of a combination of software modules developed in several languages, including FORTRAN, Java and C. Several of the modules require proprietary software packages in order to run CALSIM II (Lahey FORTRAN and XA Solver). DWR and USBR staff have said that these components are being replaced by public domain software that can be obtained free of charge. We agree with this decision. Very good public domain software packages of optimization, visualization, file management, and data base support are currently available, and new ones will continually be produced. Periodic updates should be anticipated as part of the business of maintaining the modeling system.

Significant thought should be given to the sustainability of the CALSIM II software. How will future programmers be able to maintain this software? How will future software developments

be incorporated into the system? Will the solver currently being developed by LBNL be adequate in terms of accuracy and computation speed? Will other solvers need to be tested? Can the system accommodate these future developments without major modifications? What reasonable modifications could be made now in anticipate of future developments?

5. Comparative Strengths and Weaknesses

Many of the stakeholder perceived strengths and weaknesses of CALSIM and CALSIM II are very well identified in the survey report from the University of California at Davis (Ferreira, et al. 2003). Our background materials and briefings covered various strengths and weaknesses, but without first hand experience, all we can do here is to summarize those that we have heard expressed by others.

Here we provide a brief summary list.

5.1 Some Prominent Strengths

The strengths of CALSIM II are many. Most are expressed in comparison to previous DWRSIM and PROSIM models DWR and USBR were using. Some of these strengths include:

- Consensus model. CALSIM II is the official joint modeling environment of the State DWR and USBR. This includes a common schematic, hydrologic representation of the system, common set of facility capacities, and common representation of system operating policies. This helps all parties improve representations, rather than compete over representations.

- Common effort. The joint development of CALSIM II by USBR and DWR has provided more focused and effective use of resources and expertise than previous development of agency-specific models. CALSIM II development has also involved other agencies and consulting expertise more than pervious models of this system.

- Data-driven model. CALSIM II is a rather data-driven simulation model with an optimization engine. This modeling approach provides:
    a. greater flexibility than its predecessors and traditional water resources simulation approaches.
    b. a promising framework for improving transparency, data, and model documentation, compared to other approaches.

- Public domain. The model and data are substantially in the public domain, facilitating transparency and adaptability for California's decentralized water system.

- Steady improvements. Data improvements have been steadily pursued following the adoption of CALSIM II, although deficiencies remain.

- Improved Delta water quality representation. Although problems appear to remain, the model developers have made substantial gains in representing Delta water quality operating criteria and performance.

- Better groundwater representation. Efforts to better include groundwater and non-CVP-SWP project operations merit continuation and expansion.

- Benchmark Studies. The development of documented benchmark studies have resulted in significant model improvements and aided in the development of comparative model applications. Such exercises should be continued and improved.

- Long-term vision. The vision of a more transparent and publicly available model that can be employed by those outside the major agencies is excellent. This is a major change in direction, and achieving this vision will require adjustments over time. Often, these adjustments will be externally driven. Externally-driven improvements are a price of success and evidence of success for an open, public, modeling policy.

- Important CALSIM II features:
    a. CALSIM II is able to simulate the operation of the complete CVP-SWP system in all areas that contribute flow to the Delta in monthly time-steps.
    b. CALSIM II is being applied to examine a diverse range of options including flood control, water conservation and supply, power generation, recreation, water transfers, groundwater banking, recycling, desalination, conjunctive use, the purchase of options and streamflow and water quality protection.
    c. CALSIM II has successfully been applied by both DWR and USBR to examine both structural and non-structural changes to the CVP-SWP system as well as to ascertain the risks involved with different potential operating scenarios and to quantify the impacts of proposed actions.
    d. CALSIM II can dynamically model operation of environmental water accounts.
    e. Demands may vary according to various levels of development (e.g. 2001, 2020) and to hydrologic conditions.
    f. The regulatory environment under which the projects must operate can be simulated.
    g. CALSIM II can link to external modules as needed, e.g., to estimate the salinity at water quality stations within the Delta.

5.2 Some prominent weaknesses

As its strengths are many, so are its weaknesses. It seems worth saying, however, that no model can perfectly (meaning efficiently and effectively) serve all interests in a system as complex as the CVP-SWP. Tradeoffs need to be made. This can result in what some would call weaknesses. Such weaknesses are often accepted to gain strengths in another ways.

We heard that the CALSIM II model was too complex. We also heard that it did not handle particular components of the system with sufficient detail. And such is the dilemma of any

complex model, such as CALSIM II. The model is clearly too complex, and not complex enough. The root of this difficulty is that when such a model is constructed, it is not clear what level of detail is needed, so the model must be made sufficiently complex to ensure it is complex enough. And the complexity needed to address some issues will remain in the model when it is used to address other less complex issues, or the same issues at less complex locations. One approach to addressing this issue is to develop different linkable modules of CALSIM II having different complexities. In this way the level of detail can be varied to be consistent the application or study at hand, and level of sophistication and resources available to the user.

Other weaknesses model users would like addressed include:

- The model provides limited and inadequate coverage of non CVP or SWP water and of the California water system south of the Delta.
- The model assumes that facilities, land-use, water supply contracts and regulatory requirements are constant over this period, representing a fixed level of development rather than one that varies in response to hydrologic conditions or changes over time.
- Groundwater has only limited representation in CALSIM II.
- Groundwater resources are assumed infinite, i.e., there is no upper limit to groundwater pumping.
- The linear programming model considers only the current month, and hence CALSIM II operating rules are required to determine annual water allocations, to establish reservoir carryover storage targets, and to trigger transfers from north of Delta to south of Delta storage.
- Better quality control is needed both for the model and its current version and the input data. Procedures for model calibration and verification are also needed. Currently many users are not sure of the accuracy of the results. A sensitivity and uncertainty prediction capability and analysis is needed.
- Need improved ways of altering the model's geographic scope and resolution and its temporal resolution to better meet the needs of various analyses and studies.
- Need to improve the model's comparative as well as absolute (or predictive) capabilities.
- CALSIM II needs better capabilities for analyzing economic, water quality, and groundwater issues.
- Need improved documentation explaining how the model works, its assumptions, its limitations, and its applicability to various planning and management issues.
- DWR and USBR have not provided a centralized source of support for CALSIM II. More training for CALSIM II is needed. There is a need for more people who can run CALSIM II. There is a need for a well-publicized user group. A more extensive users' guide is needed.
- Improved capabilities are needed for real-time operations especially during droughts, gaming involving stakeholders during a simulation run, handling of evapotranspiration and agriculture demand changes over time, water transfers, Delta storage, carryover contract rights, refuge water demands and more up to date representation of Feather River, Stanislaus River, Upper American River, San Joaquin River and Yuba River operations.

- Need an improved graphical user interface to facilitate input of model data, setting of model constraints and weights, operating the model, and displaying and post analysis of model results.
- Need to be able to change the model time period durations for improved accuracy of model results.

6. Limitations, Uncertainties, and Impediments

6.1 Absolute Values or Comparative Results

Modelers sometimes make a distinction between the use of a model for *absolute* versus *comparative* analyses. In an absolute analysis one runs the model once to predict an outcome. In a comparative analysis, one runs the model twice, once as a baseline and the other with some specific change, in order to assess change in outcome due to the given change in model input configuration. The suggestion is that, while the model might not generate a highly reliable absolute prediction because of errors in model specification and/or estimation, nevertheless it might produce a reasonably reliable estimate of the relative change in outcome. The panel is somewhat skeptical of this notion because it relies on the assumption that the model errors which render an absolute forecast unreliable are sufficiently independent of, or orthogonal to, the change being modeled that they do not similarly affect the forecast of change in outcome; they mostly cancel out. This feature of the model is something that would need to be documented rather than merely assumed.

In our opinion CALSIM II has not yet been calibrated or validated for making absolute predictions values. Yet it is apparent that there has been a distinct need by model users for absolute predictions. In the absence of alternatives, users are adopting CALSIM II results as the best absolute prediction available and they are likely to continue to do so. We recommend that model developers recognize the requirement for CALSIM II to provide absolute predictions. To satisfy this new purpose, additional calibration of the model will be required to ensure that the output it produces is fit for this purpose. Regardless of how possible it is to match the model closely with observed behavior, statistics on the accuracy of the calibration run should be supplied to users to enable them to gauge the likely errors involved with using the model output.

6.2 Sensitivity and Uncertainty Analyses

Sensitivity analyses would be useful to identify which parameters and input data have major impacts on decisions and system performance criteria of concern. Uncertainty analyses would help users of the model understand better the risks of various decisions and the confidence they can have in various predictions.

6.3 Graphical User Interface

Having a graphical user interface would substantially aid those who use the model in managing both input and output data, and in controlling or managing model operations. This model will not likely become as available to and as well understood by the public, to the extent desired by the model developers, until an effective menu-driven GUI has been created that can help create and draw from a database of system parameters and characteristics, and simulation results.

6.4 Documentation and Training

When if ever is adequate documentation and training available? Rarely, but we believe there is a serious need to improve the documentation as well as the training available for all those interested in using CALSIM II.

7. Options for Improving CALSIM

7.1 CALSIM Model Software

We encourage the developers of CALSIM to convert their present software to that which is publicly available and to develop a useful graphic based user interface that can facilitate the input, editing, and display of all the data that are input to and output from CALSIM II. There are many options, some of which we have discussed with the model developers.

The CALSIM package should be made more modular and capable of linking to other more complex models of components of the CVP-SWP system. If the changes in code and modeling approach result in a quicker running model, it might be possible to link, when desired, modules that facilitate position analyses and other types of uncertainty analyses. A modular system would allow alternative representations of different components of the system. Thus different levels of spatial detail, or representations of the fundamental processes, would be allowed within the overall system representation and record of California hydrology. This will allow the use of more general and streamlined models for use of preliminary investigation and general planning, as well as a more detailed representation of the system for final analyses and more detailed studies. This would be very useful.

7.2 Sensitivity and uncertainty analyses

Both sensitivity analyses need to be performed, and procedures need to be developed to enable the estimation of measures of uncertainty associated with model output. Perhaps workshops focused on just these needs should be scheduled to better determine how best to meet these needs. There are numerous procedures available that could be applied. Appendix H contains some approaches for performing sensitivity and uncertainty analyses.

7.3 Model calibration

There is a need to develop the model so that it is able to provide absolute estimates of key model outputs rather than limiting the use of the model to comparative studies. One way to do this is to subject the model to a comprehensive calibration process where it is fine-tuned until it is able to reproduce the historical behavior of the system with sufficient accuracy to provide absolute results. The calibration of the model should aim to test all the key outputs of model including water quality in the San Joaquin River and in the Delta. It is necessary to test the monthly values of outputs for those outputs for which the monthly pattern is important.

7.4 Other extensions and improvements

- The opportunity of improving the collection of data on the use of water (preferably broken down by irrigation district and water source) should be investigated. The use of groundwater should be included in this investigation.
- It would be useful to expand the geographic extent of the model so that it includes all the components of the linked water supply system, including both the San Joaquin and Tulare Lake Basins of the Central Valley. The model should also account in some manner for imported supplies of water to users in southern California from the Colorado River.
- The linkage between surface water and groundwater would appear to be of critical importance and output that would enable the impact of surface water use on groundwater extractions would appear to be useful.
- Examination of the report *'CALSIM II Simulation of Historical SWP/CVP Operations'*, DWR (2003) indicates that the current formulation of CALSIM II:
  - Overestimates water deliveries to SWP and CVP contractors,
  - Determines carryover storage target values that differ from those the operators have determined in the past, and
  - Operates the San Luis Reservoir at lower levels and fills it later in the season than operators have in the past.

8. Managing CALSIM Development and Applications

The predicted impacts and other information derived from CALSIM II applied to the CVP and SWP can influence major investment decisions. It is thus self evident that those who use the model results need to have some confidence as to their precision. Is the science behind the information derived from CALSIM II been reviewed and judged correct? Is the model software free from errors? Are the assumptions made when performing the modeling the correct ones? Are the model results accurately and fully reported? In other words, just how much credence should decision makers place in the model output? Users of the model results should be assured that they are credible and unbiased. One way to help ensure this is to have the models, their associated software, and their applications under the control of some interagency organization that can oversee and provide quality control over model development, application and documentation. They can also plan and implement needed peer reviews.

One possible means of facilitating the peer review processes and for maintaining control on the particular versions of CALSIM II and accompanying models used for CVP-SWP planning and management decisions is to create an interagency modeling consortium (IMC) consisting of DWR, USBR, and other stakeholder organization (including university) personnel if they are interested and want to participate. This center would be responsible for maintaining a toolbox of 'acceptable' models for use by the agencies and contractors. The models placed in the toolbox should be peer reviewed with respect to their applicability and suitability for use in particular applications. Those that are not peer reviewed should be considered for peer review. New models proposed for use in California should be peer reviewed with respect to their suitability, and for their strengths and limitations, before being placed in the toolbox. The review should be of the theory underlying the model, the model's software, the documentation of the model as well as of its software, the model's functions and capabilities including those pertaining to model data input and output, the input data themselves, model calibration and verification, capabilities for sensitivity and uncertainty analyses, user control of all model operations including pre and post analyses (GUIs), spatial and temporal resolutions, and its limiting assumptions.

9. Future Use, Development, or Replacement of CALSIM

9.1 A coupled optimization simulation approach

Given a system as complex as the SWP/CVP system, it seems to us it might make sense to consider the development of a more detailed simulation 'engine' and couple it to an optimization or management 'engine'. The simulation component can more accurately model hydrologic processes. For example it can include the deterministic non-linear routing of flows and their quality constituents through the system on a smaller time step (e.g., daily) and hence much more realistically or accurately, than can linear optimization using longer time steps, even with all the known tricks for linearizing separable (single variable) non-linear functions and 'if-then-else' statements. The simulation engine itself may require a simultaneous equation solver, especially for the Delta. But the simulation engine needs to know what to do, i.e., what decisions to make. Periodic use of the optimization, say once a week or even less frequently if conditions are relatively constant, for determining the decisions to be simulated, e.g., the water allocation and reservoir release decisions, eliminates much of the maze of rules that otherwise would be required and which developers of CALSIM II are avoiding through the use of optimization. Each time the optimization or management 'engine' is run it is first updated with the current state of the system as determined from the more precise simulation 'engine'. The optimization component would include multiple time periods only to the extent that the current period's solution is not affected by the time horizon in the optimization. The other time period solutions are ignored. This coupled optimization-simulation approach has the potential to be both more accurate as well as quicker to execute. In our opinion it is worth considering for future development.

9.2 Models as hypotheses

CALSIM II is really about the future, not the past. Benchmarking studies can help establish the credibility of the model and provide estimates of its accuracy by comparing its performance to actual historical operations. A concern is how well the model reproduces historical operations, not whether it is valid or invalid on some absolute scale of perfection. But the real issue is how well CALSIM can predict what might happen in the future with sets of hydrological and meteorological conditions that have not yet been experienced, and may be significantly different from the past if climate variability and climate change are considered. In these cases the ability of the model to forecast what will happen depends both upon its ability to describe what would happen should a particular system operating policy, priorities and water demands be adopted. In this sense CALSIM II modeling studies should be thought of as the exploration of a hypothesis that particular policies and priorities have been adopted. Our ability to predict the future has generally been poor, but it is the obligation of agencies such as DWR and USBR to attempt to ensure that should water demands, water supplies, and water policies evolve as one would expect, society is prepared for the consequences. And that would seem to be what CALSIM II is about.

9.3 Future Model Development and Use

From the list of perceived weaknesses above, there are clearly many opportunities for further refinement of CALSIM II. Rather than attempt to meet all needs using only one model, namely CALSIM II, it seems preferable to improve its adaptability to various levels of detail through its ability to link to other models when additional detail in a particular region or for a particular feature is desired. For example, the monthly time step used by CALSIM II is sufficient for many studies. Yet some seasonal (multi-month) decision making is needed in CALSIM II to reflect decisions made by the SWP and CVP as to what Table A and other allocations to honor in full. On the other hand, it is clear that many water quality and ecosystem management decisions would profit from more detailed weekly or daily time steps. However, such shorted time-step models will need the guidance of a longer time-step model. As discussed earlier, models with shorter time scales can require increased spatial resolution, both of which lead to increased model complexity and a strong argument for model modularity.

Additional potential applications of CALSIM II include operational planning using gaming, or the involvement of potential decision makers during the simulation runs via a well developed graphical user interface, and to improve the capability of modeling water quality, energy production, conjunctive groundwater and surface water interactions and use, to mention a few.

There will always be a need to perform alternative 'what if' policy analyses where a relatively fast model that also provides some capability for uncertainty analyses is required. Perhaps CALSIM II will never be able to serve this need, and if so another more simplified modeling approach could be developed to fill that need. This simpler screening tool would be calibrated to produce results comparable to those of CALSIM II or observed data. Is this possible? We can not be certain but feel the idea should be seriously considered.

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Caveat

Just as all models are approximations of reality, so may all advice be an approximation of what it should be. We hope what we have written in this report is correct and useful, but encourage CALSIM model managers and California's water community to take our assessments and suggestions for what they are, arrived at based on our own experiences and some limited exposure to those who know much more about CALSIM and CALSIM II than we do.

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Appendix A: CALSIM II Science Review Schedule

Appendix B: Briefing Material for CALSIM II Peer Review

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Appendix F: Analysis of the November 2003 CALSIM II Validation Report

Appendix G: Some Principles for Strategic Water Analysis

Appendix H: Model Sensitivity and Uncertainty Analysis

Appendix I: Model Calibration Examples

1. CALSIM Compared to Other Modeling Approaches

Management of complex systems such as coordination of the California State Water Project (SWP) and the Federal Central Valley Project (CVP) requires effective decision support tools for simulating and analyzing system components in a fully integrated manner. The classic definition of a decision support system (DSS) provided by Sprague and Carlson (1982) is *"an interactive computer-based support system that helps decision makers utilize data and models to solve unstructured problems."*

A DSS integrates the following interactive subsystems: (i) dialog generation and management subsystem (DGMS) for managing the interface between the user and the system; (ii) data base management subsystem (DBMS); and (iii) model base management subsystem (MBMS).

CALSIM II is a DSS developed as a joint venture between the California Department of Water Resources (DWR) and the U.S. Bureau of Reclamation (Bureau) to (i) provide a significant modernization and upgrading of the previous models DWRSIM and PROSIM employed by these organizations, (ii) develop a comprehensive modeling system that simultaneously addresses the current and future needs of both the SWP and CVP; and (iii) develop a generalized modeling system that could be applied in any river basin system, in contrast with the previous models that were less generalized and more specifically designed for the SWP and CVP. In this respect, CALSIM II represents a state-of-the-art modeling system that is similar in general concept, while differing in specific details, to other river basin modeling systems such as AQUATOOL (Valencia Polytechnic University, Spain), ARSP (Acres Reservoir Simulation Program) (Boss International, 2003), IRAS (Interactive River-Aquifer Simulation) (Loucks, et al. 1996), MIKE BASIN (Danish Hydrologic Institute, 2002), MODSIM (Labadie and Larson, 2000), OASIS (Randall, et al., 1997), RAISON (Young, et al. 2000), ResSim (U.S. Army Corps of Engineers, Hydrologic Engineering Center), Ribasim (River BAsin SIMulation Model) (Delft Hydraulics, Netherlands), REALM (REsource ALlocation Model) (James, 2003), RiverWare (Zagona, et al. 1998), WaterWare (Jamieson and Fedra, 1996), and WEAP (Water Evaluation and Planning System, 2003) (Hansen, 1994). All of these can be categorized as decision support systems since all three subsystems of a DSS are embodied within them.

A distinguishing feature of several of these modeling systems is the use of optimization on a period by period basis (not fully dynamic) to "simulate" the allocation of water under various prioritization schemes, such as water rights, without the presumption of perfect foreknowledge of future hydrology and other uncertain information. This is a valid approach since use of optimization overcomes the disadvantage of employing numerous, unwieldy prescriptive rules governing water allocation. Systems employing optimization in this manner include: ARSP, MODSIM, OASIS, REALM, RiverWare, and WEAP and are therefore more akin to CALSIM II. ARSP, MODSIM, REALM and Ribasim are further distinguished by use of specialized minimum cost network flow optimization algorithms, although of these only MODSIM includes iterative structures using an imbedded scripting language for including non-network "side constraints" in the optimization. The other modeling systems are essentially limited to a

pure network structure that does not allow inclusion of all the complex, non-network type constraints necessary to model the complex CVP-SWP system.

It may be useful to compare this use of optimization with some other uses that have appeared in the modeling literature. One use of optimization is purely for computational convenience; in this case optimization is employed as a numerical method for obtaining the solution of a series of simultaneous (often linear) equations. This approach, which was used in the first generation of computational economic models about forty years ago, exploited the fact that some existing computational algorithms for solving optimization problems were faster than those for solving large systems of simultaneous equations. A second use of optimization applies when the solution of the system of equations characterizing a water balance has multiple possible solutions; this is essentially the case described above, where optimization is being used primarily to identify a unique solution for a system of equations. Both of these uses of optimization are primarily descriptive rather than prescriptive (also referred to as positive vs. normative) in intent: the goal is to model how a system, characterized by a set of equations, operates. To the extent that the real–world managers of the system do optimize some objective function, the aim is to mimic their behavior by setting up and solving a similar optimization. But, the goal is to model what they actually do, not to advise them what they ought to do. The third use of optimization adopts an explicitly prescriptive goal and sets out to ascertain what managers ought to do if they wished to optimize some objective function (e.g. maximize economic efficiency). While this is certainly a legitimate analytical exercise, it should be kept conceptually distinct from the use of optimization in a purely descriptive context.

1.1 Advantages of Optimization-Driven Simulation

For large, complex, integrated systems, simulation models that optimize operation and allocation of water within each time-step by operational priorities have become the major simulation approach. Models of similar approach include ACRES (Acres Engineering), AQUATOOL (Spain), MODSIM (Colorado State U.), OASIS (Hydrologics, Inc.), WASP (Australia), and WEAP (Tellus Institute). Priority-based simulation models with optimization engines have become widespread in part because:

- The models are simpler to develop, comprehend, and modify.
- Their software is easier to upgrade, since the data set describing the system and its operating policies is substantially separate from the software code.
- Data are easier to update and modify, since changes require little or no software changes.
- Priority-based operations are a common basis for water rights and operating policies.
- Priority-based operations are relatively easy to explain.

The major exception to this technological trend in simulation modeling is to use more traditional procedural operating rules in simulation models with a graphical user interface for primarily flood control operations (HEC-RESSIM) or for exploratory study of large systems or detailed management of relatively small systems (Stella-type models).

Similar to several of these systems, CALSIM II allows specification of objectives and constraints in strategic planning and operations without the need for reprogramming of

complex models. The CALSIM II authors developed the English-like WRESL (Water Resources Engineering Simulation Language) as an intuitive means of defining the objective function and constraints for a mixed-integer linear programming model, similar to the OCL (Operational Control Language) used in OASIS and the Policy Editor employed in RiverWare. In MODSIM, the optimization model is formulated directly through the graphical user interface with no need for a modeling language, but with supplemental features of the optimization defined through the PERL scripting language. WRESL allows planners and operators to specify targets, objectives, guidelines, constraints, and their associated priorities, in ways familiar to them. WRESL provides simple text file output that is converted to FORTRAN 90 code by a parser-interpreter program, whereas PERL is fully embedded in the network optimization code. Both modeling systems are data centered, meaning that model operation is controlled solely by user specification of input data rather than hidden rules or hard-wired data structures.

CALSIM II, OASIS, RiverWare and MODSIM are similar in that all use a high level language with syntax and logical operators; are written to simple text files which are subsequently parsed and interpreted; use rule-based or IF-THEN-ELSE conditional structures; are designed to be easy for planners and operators to use without the need for reprogramming; allow adaptive and conditional rules which are dependent on current system state variable information; include constructs for assigning targets, guidelines and constraints, along with their associated priorities; and include a goal seeking capability. CALSIM employs a mixed integer linear programming solver for repeated period by period solution that is less efficient computationally than the network solver employed in MODSIM, ARSP, REALM and Ribasim.

Unfortunately, unlike these aforementioned modeling systems, CALSIM lacks a comprehensive graphical user interface for constructing and editing the river basin system topology. CALSIM II would be greatly enhanced if, similar to RiverWare, IRAS, and MODSIM, objects representing features of the basin such as reservoirs, canals, and river reaches, could be created on the palette of a graphical user interface by simply clicking and dragging various icons for the objects to the display. The objects are instances of various classes that share certain common characteristics, and each object contains its own physical process methods and associated data. We believe that complaints concerning the complexity of using CALSIM II would be greatly reduced with development of such an object-oriented graphical user interface.

2. Comparative Strengths and Weaknesses

2.1 Some Prominent Strengths

CALSIM II has important strengths as a general inter-regional operations planning model, particularly compared with available alternatives and its predecessors. The primary strengths include:

- Coordination of Federal and State Interests A unique aspect of CALSIM II is the high degree of cooperation between Federal (i.e., U.S. Bureau of Reclamation) and State (i.e.,

California Department of Water Resources) interests in its development. This kind of cooperation is rare, and in fact this may be the only such example of such coordination for a system of this scale and complexity. Although it is clear that DWR staff have taken the greatest degree of responsibility in the planning, development, coding, testing and application of CALSIM II, it is also clear that USBR staff have also played an important role. CALSIM II can provide a showcase for other states as to what can be accomplished with Federal and State cooperation for river basin management.

- Consensus model. CALSIM II is the official joint modeling environment of the State and USBR. This includes a common schematic, hydrologic representation of the system, common set of facility capacities, and common representation of system operating policies. This saves a lot of unproductive bickering and helps all parties improve representations, rather than compete over representations.

- Common effort. The joint development of CALSIM II by USBR and DWR has provided more focused and effective use of resources and expertise than previous development of agency-specific models. CALSIM II development has also involved other agencies and consulting expertise more than pervious models of this system.

- Data-driven model. CALSIM II is a rather data-driven simulation model with an optimization engine. This modeling approach provides:

    a. much greater flexibility than its predecessors and traditional water resources simulation approaches.
    b. a promising framework for improving transparency, data, and model documentation, compared to other approaches.

- Public domain. The model and data are substantially in the public domain, facilitating transparency and adaptability for California's decentralized water system. Ongoing software development efforts will improve CALSIM in this regard.

- Steady improvements. Data improvements have been steadily pursued following the adoption of CALSIM II, although deficiencies remain widespread.

- Improved Delta water quality representation. Although problems appear to remain, the model developers have made substantial gains in representing Delta water quality operating criteria and performance.

- Better groundwater representation. Efforts to better include groundwater and non-CVP-SWP project operations are good efforts in the right direction, and merit continuation and expansion.

- Benchmark Studies. The development of documented benchmark studies seems to have resulted in significant model improvements and aided in the development of comparative model applications. Such exercises should be continued and improved.

- Long-term vision. The vision of a more transparent and publicly available model that can be employed by those outside the major agencies is excellent. This is a major change in direction, and achieving this vision will require adjustments over time. Often, these adjustments will be externally driven. Externally-driven improvements are a price of success and evidence of success for modeling policy that is open and public.

Few, if any, modeling organizations in the country have consistently done as good a job on model development and application for such a large, complex, and controversial system as the modeling group which developed CALSIM II. They are to be commended for their work to take California water modeling beyond past "closed shop" practices in favor of the development and dissemination of modeling capabilities that are more relevant to California's current water management problems. Most areas and suggestions for improvement noted below are meant to aid the model developers in moving further and faster in the direction they are already heading.

2.2 Some Prominent Weaknesses

The strengths and weaknesses of CALSIM II are not only technical (software, data, and methods), but also are institutional regarding how this model has been developed and employed. The administrative setting and objectives of model development and application are important, and difficult to manage. Alas, the management/policy problems of a system change frequently, while data and modeling capability change more slowly, and effective administrative structures change very slowly, if at all.

- Inadequate data development and management are principal shortcomings of CALSIM II. There has not been a sufficiently systematic, transparent, and accessible approach to the development and use of hydrologic, water demand, capacity, and operational data for CALSIM II. This problem extends beyond inadequate documentation and has led to controversy, confusion, and inefficiency in application of CALSIM II.
    a. Inadequate data management steepens the unavoidably difficult learning curve inherent for a complex system. Data have mostly been considered a "back room" activity of a few experienced experts. Retirement, promotion, or departure of these experts has left many gaps in knowledge and created difficulties for re-developing data for newer policy and planning problems.
    b. The administration of data development is fragmented, disintegrated, and lacks a coherent technical or administrative framework. Data required by CALSIM II are developed by several administrative units, without systematic technical vision or quality control for modeling purposes. Within DWR, different groups develop hydrologic and water demand data under different Deputy Directors, without effective coordination. This division must be overcome for a coherent data and analytical framework to be developed and implemented.
    c. In many cases it appears that water use and other hydrologic data inputs to CALSIM II are based on data collection and analyses that took place during the 1960s when DWRSIM and PROSIM were being constructed. It is important to ensure that data used for CALSIM II are up-to-date and consistent with the best current information

- The expertise and insights of many in local agencies, system operators, and consulting firms have not been prominent in the development of CALSIM II. For such a system with many hundreds of local experts, this is somewhat unavoidable, especially early in model development. Periodic re-examinations of how each area in CALSIM II is represented, in consultation with local agency and consulting experts, might overcome these technical shortcomings, and create and maintain a broader technical, user, and credibility base for CALSIM II. Active involvement of local agencies in CALSIM II development and applications would be much easier with better data management, and would be rewarded with a broader base of CALSIM II expertise and enhanced model credibility.

- Compared to the current CALSIM II, any central operations planning model for California water management should be:
    a. Expanded in geographic scope to include major non-CVP-SWP areas, especially the Tulare Basin, the Colorado River, and southern California. Operations and demands in these regions seem increasingly important for CVP and SWP operations, and are important for the integrated operations of California's major local and regional water management agencies.
    b. Expanded in management scope to include local management options such as water conservation, reuse, water transfers, groundwater and conjunctive use management, etc. These additional water management options are important for local, regional, and statewide water policy, planning, and management efforts and can have significant effects on CVP and SWP water demands.
    c. Made regionally modular, so smaller regional models can be run independently and tested locally, with boundary conditions consistent with the larger model.
    d. Made modular in terms of hydrologic, water management, and water demand processes, allowing better development, comparison, and updating of hydrologic and water demand process models. Agricultural, urban, environmental, and other water demands should be represented more directly, and explicitly. Groundwater should be represented and operated more explicitly. Land use based local hydrology and water demand approaches might be implemented in such standardized modules.
    e. Subject to a systematic model and data testing regime and continuous quality improvement program. As the problems of California water change, different and greater demands will be placed on analytical capability, requiring an essentially continuous testing, re-testing, and improvement of data and models. This might parallel a continuous review of local representations and data involving local agency and consulting experts.
    f. Financed on a broader base, by more than the CVP and SWP projects. Increasing use of CALSIM II is being made by local, regional, State, and Federal agencies interested in developing bilateral or multi-lateral water transfers or projects, which incidentally involve the CVP and SWP. To develop inter-regional modeling capability needed to integrate these activities at local, regional, and inter-regional scales, more sustained funding and involvement from local and regional agencies is needed. In effect, local and regional agencies have been "free riders" on CALSIM

II's analytical capabilities, and it is not necessarily a good bargain for them. Everyone should benefit from broader technical and financial participation.

g. Capable of analyzing a wide range of scenarios. More capability is needed to examine various long-term scenarios with respect to hydrologic, water demand, and operational uncertainties in the future. There also needs to be a better capacity to accommodate other approaches to representing hydrologic uncertainty and variability besides simply simulating 70-plus years of record.

- Input data and its development. Important aspects of CALSIM II rest upon the representations of other models of Delta hydrodynamics and water quality, water demands, and groundwater. The credibility of CALSIM II also rests on testing these models that send important data/representations to CALSIM II, and documenting them adequately. These models include:

  a. CU Model and SIMETAW: The consumptive use model and the newer SIMETAW model, used to develop hydrologic inputs and estimate return flows, also require testing and more explicit documentation. The underlying data for these models also need more systematic, standardized, and transparent treatment.

  b. DSM2: Representation of the Sacramento-San Joaquin Delta will always be important and prone to controversy, given the prominent importance of Delta flows and water quality for the operation and planning of California's water system. The difficulties of representing the Delta in operations and planning models are compounded by the tidal nature of the Delta, which usually implies a need for shorter time-steps. Representation of Delta water quality constraints currently falls heavily on an ANN method within CALSIM II. This ANN is calibrated (trained) based on a hydrodynamics model, DSM2. Thus, controversies regarding Delta representation in CALSIM II are likely to lead to questions of the adequacy of DSM2. The transparency and testing procedures valuable for establishing the credibility and limitations of a Central Valley operations model would also seem to apply to DSM2, or any other Delta hydrodynamics-water quality model. Tests of methods used to represent small-time step phenomena with larger time-steps (e.g., "partial month standards") should be tested in a forum that would give the approach credibility and where its limits could be developed, discussed, and documented.

  c. CVPM/CALAG/LCPSIM/IWR-MAIN: Representations of water demands in CALSIM II rely heavily on other models, particularly CVPM and eventually CALAG for agricultural water demands and LCPSIM and eventually IWR-MAIN for urban water demands. Thus, these models also will attract attention, and will probably require the same types of testing, transparency, and documentation suggested for DSM2 and CALSIM II. Many water contractors of the CVP and SWP also have internal water sources (groundwater, water conservation, and water reuse) and side contracts with other agencies to supply water that can increase or decrease (at different times) their water demands from the CVP and SWP contracts and from the demands estimated from CALAG and IWR-MAIN types of models.

  d. IGSM /CVGSM: Water users in California rely on groundwater as a water source and as the major source of over-year drought storage. Groundwater is also being increasingly used and looked-towards as a source of storage as part of conjunctive use schemes, and water transfer and market schemes. Thus, representation of

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groundwater in the system is important, and probably should be expanded considerably. The representation of groundwater quantities, storage, and recharge and pumping capability will also attract attention from interested and critical parties. Thus, the IGSM/CVGSM modeling efforts of DWR and USBR should include the same types of transparency, documentation, and testing suggested for CALSIM II.

e. Agricultural demands: Agricultural demands in the model are estimated by an external modeling system (CU model). Staff noted that the estimation methods being used are include out of date information on agricultural cropping patterns and irrigation technology, both of which result in inaccurate estimates of agricultural water demands. This estimation process needs to be revised and updated to include current information on an ongoing basis. The methodology needs to be improved to include economic factors in the estimation of cropping decisions and water demands. In many case, the preferred spatial scale for the economic modeling of agricultural water demand is going to be the individual irrigation district rather than very broad areas containing multiple quite heterogeneous districts.

- CALSIM II is currently awkward to apply for broader State and CVP-SWP policy questions. Practically, the time needed to complete analyses is too long and CALSIM II does not explicitly represent many of the management options which policy makers are interested in investigating, evaluating, and orchestrating.

- More CALSIM II modelers are needed. Many water managers and policy makers across California look to CALSIM II for many purposes, and there is near-universal consensus that the application of CALSIM II is currently limited by a dearth of knowledgeable modelers. Current training by DWR and USBR on CALSIM software is useful, but clearly insufficient. To be a functioning and credible CALSIM II modeler one must understand both CALSIM software and the operational complexities of the system (which probably no one can know in its entirety). Improved model and data documentation is also essential here.

- Stakeholders and policy makers are poorly guided in how to interpret CALSIM II results. Not only must CALSIM II become more responsive to current planning and policy concerns and management options, but current policy makers must receive some education in the benefits and limits of such modeling for their purposes. This is a very difficult problem that will often involve the role assigned to modeling and model results within larger politically-driven policy making processes.

- Non-interpretation of model results is not helpful. Several recent DWR reports based on CALSIM II results have been considerable improvements over past practices in terms of presenting model results, discussion of the model, and examination of model performance in a historical context. However, often the studies have not contained the kind of written discussion and interpretation of results that would demonstrate that the authors have thought about the results and drawn conclusions in a realistic and self-critical manner. This detracts from the perceived credibility of the work and makes the study less informative for readers (most of who surely do not have the modeling background of the authors).

- Some needs exist to improve CALSIM software. These are well-known to the model developers and include:
  a. Elimination of the need for the FORTRAN compiler,
  b. A public-domain mixed integer-linear programming (MIP) solver,
  c. A graphical user interface, including ties to databases and GIS display if possible,
  d. Post-processing tools for users to help new users and broader application and scrutiny of CALSIM II results,
  d. Version control software and system (also a problem for model administration),
  e. Better data and database management software and protocols (this has great data management and administration implications),
  f. An ability to more systematically set objective function weights,
  g. More automated input and output data checking is needed to improve productivity in model application and quality control of modeling output. This would also facilitate use of CALSIM II by a broader range of modelers,
  h. Ability to access and employ sensitivity analysis information coming from the MIP solver to identify possible multiple optima and identify binding constraints and slacks,
  i. A debug version of the code where water can be added or subtracted at any location and time (at a great penalty) to quickly identify locations and times of model infeasibilities. (Prof. J. Lund has had great success with this approach to correcting infeasibilities in the CALVIN model of California for a network flow algorithm.),
  j. Time-step issues should be explored and evaluated comparatively. There are major drawbacks to shortening time-steps system-wide (run-time, data development, interpretability of results, etc.), but short time-step components within the model or other approaches might adequately represent short-period aspects of the system for many purposes.

There will be some who argue that CALSIM II is and should remain a model of only the CVP and SWP system. While this would be simpler administratively and financially, it seems technically and politically untenable. California's water system is being asked to operate in an increasingly integrated manner across local and regional scales, with multiple local water demands, supplies, and aquifers being coordinated with the operations of major aqueduct and storage infrastructure. Any model of the CVP and SWP systems must be responsive to this operational integration, either implicitly through better parameterization of local supplies and demands, or explicitly by widening the geographic and functional scope of the model.

3. Limitations, Uncertainties, and Impediments

3.1 Removal of Unnecessary Ties to DWRSIM and PROSIM

Much of the spatial detail employed in CALSIM II is a carryover from the previous DWRSIM model. This is particularly evident in the coarse delineation of watersheds and sub-areas, which may no longer be relevant for future applications of CALSIM II. It is recommended that all unnecessary ties to the previous DWRSIM and PROSIM models be removed in further development of CALSIM II.

3.2 Relative vs. Absolute Predictions

As noted in the Executive Summary, we are skeptical of the usefulness of the distinction between comparative and absolute predictions. To declare that CALSIM II is intended for comparative predictions and should not be used for absolute predictions is not a helpful or desirable strategy. Rather than embracing this limited view of what CALSIM II can be expected to accomplish, we recommend that model developers recognize the requirement for CALSIM II to provide absolute values. To satisfy this purpose, additional calibration of the model will be required to ensure that it provides a reasonably reliable depiction of how the California water system operates. In addition, data on model accuracy and the outcome of the calibration runs should be made available so that users can gauge the likely errors involved in using the model for their own particular purposes. Some methods for doing this and performing sensitivity and uncertainty analyses are contained in Appendix H.

Model uses should realize that model calibration and validation exercises can illustrate only how well the model can reproduce historical decisions and system behavior. Our ability to predict future policy decisions and the emergency responses to water shortages is clearly limited, thus decreasing the absolute precision of any model's predicted values of various system performance measures. Thus it is useful to distinguish between the ability of the model to reproduce correctly the physical operations of the water systems in California (which should be good), its ability to reproduce and anticipate decisions by the agricultural sector that determine the quantities of water the consume, and its ability to mimic historical and current water operation decisions by the CVP, SWP and other water management agencies.

In general, it appears that the developers of CALSIM II do not have a clear idea of how to define the scope of CALSIM II use and many of the applications are evolving in a reactionary manner. Model developers should identify clearly the desired uses for CALSIM II and then determine acceptable approaches for satisfying those desires. Developers should seek to improve data accuracy and overcome unrealistic assumptions to improve confidence in model results.

3.3 Hydropower

CALSIM II is currently greatly lacking in hydropower computations, which is an important of the federal CVP system. This should include risk-based power capacity evaluation, and possible incorporate the ISM (indexed sequential hydrologic modeling) method that the Bureau has used for many years in hydropower capacity analysis. Also, hydropower should not simply be an after-the-fact calculation, but explicitly included in the system objectives.

3.4 Daily operations

A great challenge awaits the developers as they attempt to adapt CALSIM II to daily operations. These challenges are primarily related to the impacts of routing on distribution of flows and scheduling of reservoir releases. Under the current period-by-period optimization structure over daily time increments, without appropriate consideration of routing there is the

danger that the model will allow diversion of upstream flows to lower priority users, resulting in injury to higher priority downstream users in the following days where travel times exceed 1 day. The proper inclusion of routing in the daily operations requires some kind of look-ahead capability in CALSIM II, which is currently lacking. In addition, scheduling of reservoir releases on a daily basis creates difficult timing issues in order to minimize unnecessary downstream spills or shortages caused by routing and attenuation of upstream reservoir releases. Another complexity in moving into daily operations is that reservoir discharges now become head-dependent, whereas this can usually be ignored on a monthly time scale. This means that the maximum reservoir release in any day will be dependent on the head, and should be based on the average head over the day, which introduces the potential for time consuming iterative processes to deal with nonlinear relationships in discharge-head curves for any reservoir.

3.5 Groundwater model

Groundwater has only limited representation in CALSIM II. This resource is modeled as a series of inter-connected lumped-parameter basins. Groundwater pumping, recharge from irrigation, stream-aquifer interaction and inter-basin flow are calculated dynamically by the model.

The purpose of the multi-cell groundwater model is to better represent groundwater levels in the vicinity of the streams to better estimate stream gains and losses to aquifers.

In the Sacramento Valley floor, groundwater is explicitly modeled in CALSIM II using a multiple-cell approach based on DSA boundaries. For the Sacramento Valley, there are a total of 14 groundwater cells.

Currently no multi-cell model has been developed for the San Joaquin Valley. Instead stream-aquifer interaction is estimated from historical stream gage data. These flows are fixed and are not dynamically varied according to stream flows or groundwater elevation.

The approach to modeling groundwater in CALSIM II, a lumped-parameter "tank" model seems to be a reasonable approach. However, few details of this implementation were provided to the review panel, that it is not possible to assess its accuracy or reliability. Details of the calibration and verification activities performed to date should be carried out and reported for the groundwater tank model. The effect of using large size tanks should be assessed and the level of uncertainty in computed results reported. In addition, the effect of these uncertainties on CALSIM II calculations should also be assessed. The San Joaquin valley aquifers are not well represented in the tank model, but it is in the CVGSWM. The San Joaquin valley groundwater should also be modeled in CALSIM II.

Groundwater availability from aquifers is poorly represented in the model. This results from the fact that aquifers in the northern part of the state (Sacramento Valley) have not been investigated regarding storage and recharge characteristics. Thus, in the model, upper bounds on potential pumping from aquifers are undefined. This does not represent reality, since, if CALSIM II is used for statewide planning, it would allow pumping of vast quantities of water for export to southern parts of the state, something which agency staff claim is unrealistic.

Realistic upper bounds to pumping from any of the aquifers represented in the model need to be developed and implemented.

In addition, historical groundwater pumping is used to estimate local groundwater sources in the model. However, the information on the historical pumping is very limited, causing these pumping rates to be very uncertain. Better pumping information is needed and an analysis of the effect of this uncertainty on model results needs to be conducted.

In general, the level of representation of groundwater in CALSIM II is not reasonable from the point of view of the reviewers. This is due to several factors, perhaps the most important being the lack of information presented to the reviewers for their assessment. Another factor is the lack of data collected and analyzed by the State of California to properly account for groundwater resources in the Central Valley. These data are critical to an understanding of the availability of water in the state and the operation of the major water systems that supply water to agriculture and small municipalities in the Central Valley. Assumptions of unlimited groundwater resources in the Sacramento Valley are unfounded and unbelievable. Efforts should be taken to make reasonable estimates of these resources.

There are other approaches that provide reasonably accurate estimates of river-aquifer interactions and groundwater basin response, while not sacrificing computer time. The response function approach is a good example, whereby the CVGSM model is used to develop kernel functions describing this response. A similar approach is described in Fredericks, et al. (1998). These kernels may require readjustment as head conditions change in the basin, but they provide a more accurate prediction tool and are easily incorporated in the MIP model since they apply a linear superposition assumption and retain the linearity of the constraints in the model. A dynamically linked CALSIM-CVGSM configuration is not necessary for reasonably accurate solutions. If computer run time for CALSIM II is considered excessive now, it could only considerably worsen if this type of linkage is incorporated.

Soil moisture is not dealt with in a realistic manner and needs to be improved in applications where the model output might be sensitive to these assumptions.

3.6 Dynamic Variation of Priority Weights

A severe restriction in CALSIM II is the inability to dynamically vary the weights used to prioritize flow allocation in the system. It should not only be possible to dynamically vary these weights, but this variation should be conditional on the current system state, however that state (or states) is defined. In addition to dynamic variation of weights, more explanation is needed of the reservoir operating rules and how these rules are incorporated into CALSIM II. The description of operating rules used in the system is not very clear. For example, what kinds of hedging or shortage rules are used to mitigate the effects of drought?

3.7 Expanding Scope of CALSIM II

CALSIM II is a considerable advance on earlier models in that it fully incorporates both the State Water Project run by the Department of Water Resources and the Central Valley Project

operated by the Bureau of Reclamation. However to be able to examine the full range of Californian water issues, it would be desirable that all components of the linked system should be incorporated in the model including the Friant system, the larger Tulare Basin, and southern California and its links to the Colorado River. Also because of the very important linkage between surface water and groundwater use, improvements should be made in this area particularly with regard to how that linkage affects demand for surface water and how access to groundwater reduces the economic impact of surface water restrictions.

When expanding the geographical scope of the model to include non CVP-SWP areas, as well as Southern California, a hierarchical, decomposition approach would allow development of separate models for these areas that can then be linked together through iterative processes. Otherwise, the CALSIM II model can become extremely unwieldy. Again, integration can still be achieved through appropriate iterative interaction between the regional models. In the same vein, it is also unnecessary to explicitly integrate water quality and detailed water demand/consumptive use models into the model structure. Iterative schemes involving successive estimation of water quality and other parameters can produce comparable accuracy at reduced computer run times, while reducing the complexity of the model.

The replacement of DSM2 with a neural network is consistent with reinforcement or machine learning methods which are increasingly being used to replace complex, computationally time consuming models employed in decision support systems. The complex models are only used to provide the data sets used for training the neural network. Current research at Colorado State University and elsewhere is using neural networks for groundwater surface water interaction and return flow computation to replace computationally expensive groundwater models.

3.8 Key Model Outputs

In the past, the primary purpose behind the development of CALSIM II and its predecessors has been the examination of the reliability of water supplied to the State Water and the Central Valley Projects. However it is clear that there is now a demand for a model that will provide a wider range of outputs including:

- Water supply reliability for all water users
- Demand for water by existing users
- Outflows to Delta
- Use of groundwater and the rate of depletion of aquifers
- Water quality in the Delta and in the San Joaquin River
- Indicators of ecological health in particular with regard to key fish species
- The value of hydroelectric generation.

Although the modules in the CALSIM II package currently address many of these areas, the recognition that all these outputs are important may necessitate some further model development and a greater degree of testing and calibration of these parameters.

3.9 Modeling Allocation, Accounting and Operating Rules

CALSIM II uses a system of weights and constraints to define the water allocation process and the operating rules for storage reservoirs. Unfortunately these do not accurately reflect how operators of the state and federal water projects behave in managing their complex systems. Ideally, CALSIM should both reflect how the operators behave and be accepted by them as a useful tool when considering their management alternatives. The failure to achieve this limits the usefulness of CALSIM to investigate the specific operating or accounting rules that are of interest to those operators. For example, CALSIM II was not used to test changes to the accounting and allocation rules that have recently been proposed by the Department of Water Resources and the US Bureau of Reclamation because the rules that were changed do not exist in CALSIM II.

4. Options for Improving CALSIM

4.1 Optimization Model and Run Times

Many of the complaints regarding using of CALSIM II relate to long run times, which is not conducive to sensitivity or uncertainty analyses. Since CALSIM II employs a mixed integer linear programming (MIP) solver, the usual sensitivity information available in linear programming solvers, such as dual variables and right-hand-side ranging, are not available. The problem is that small changes in right-hand-side constants or objective coefficients (i.e., weights on water allocation priorities) can produce large abrupt changes in model solutions. In this case, dual variables do not provide useful information for MIP problems. Sensitivity analysis can only be conducted through trial and error processes involving incremental adjustment of important weights, coefficients, and uncertain data inputs with subsequent repetitive execution of the model. In light of this, it is crucial that the MIP solver employed in CALSIM II is upgraded. Significant advances have been made in MIP solvers, as described by Bixby, et al. (2000), which are not reflected in the current XA solver utilized in CALSIM II. There have been many recent improvements to the branch and bound method which should be incorporated, and the LP solver itself can be improved with better sparse matrix analysis. As planned by the CALSIM II developers, removal of the need for use of the FORTRAN 90 compiler will also improve run times when changes in optimization model structure are required.

4.2 Confidence in the model

The usefulness of a computer model in water resource management is only as good as the confidence that the stakeholders have in the accuracy and reliability of the model and the trust that they have in the modelers. There are several factors that affect that confidence and a number of ways that confidence can be improved.

- **Documentation**

Producing documentation of models requires considerable resources to do properly and ongoing resources to maintain especially when model development is continuing. Typically documentation of any water resource model is poorly done. However, where there are external model users, as is the case with CALSIM II, it is important. The survey conducted by Ferreira et al (2003) indicated that many users of the model thought that documentation of CALSIM II was poor.

- **Seminars**

In the Murray-Darling Basin, seminars with key users and interest groups in which the operation of the model is described and discussed have proved to be useful in increasing confidence in models. The practicality of this approach will depend on the number and location of the prospective participants and the resources available to support the process.

- **Data**

A model can only be as good as the data that is used to develop and calibrate it. The agreement over an acceptable set of hydrologic data that occurred during the development of CALSIM II is a considerable advance. However, there appears to be a need to improve the collection and use of data on water diversions and return flows. Because of the close links between the surface water use and groundwater use there also is a need to have better information on the use of groundwater.

The models used to calculate the Local Water Supplies in the Depletion Study Areas depend on estimates of surface water use, crop evapotranspiration rates and water use efficiencies developed using data from the 1970's. Confidence would be improved if more recent data were available to check these estimates.

- **Calibration**

A very good way to improve confidence in a model is to calibrate it against historical data to ensure that the model output is able to reproduce the observed data. Calibration is the process of using the model to reproduce the historical behavior of the system and then fine-tuning the model so that the match between modeled and observed values improves. The calibration of the model assists in detecting errors in the model and the input data. It also enables a comparison to be made between the way that the operators actually manage the system and the way that the model assumes that the system is managed.

A further consequence of the calibration process is that the statistics of the match between modeled and observed values can be used as a reasonable estimate of the absolute accuracy of the model output.

It is legitimate in a calibration/validation run to incorporate changes to infrastructure, institutional or operational rules as they occurred especially if these changes are specified as

input parameters to the model. This was done to a limited extent in the CALSIM II validation run with three regulatory periods modeled related to decisions made by the State Water Resources Control Board. It is also legitimate to incorporate growth in demand especially if that growth is described in a manner that is consistent with the way that demand is specified in the production run. Demand north of the Delta was specified in the validation run by inputting the historical crop areas.

A Calibration/Validation report should be very useful in demonstrating the accuracy of the model. However there are a number of elements in the CALSIM II validation run and the validation report which reduce that confidence including:

- State Water Project (SWP) demands south of the Delta were set at historical deliveries in years with no restriction and at the contractor's request level in restricted years. Neither of these pieces of information is available to a production run which calculates demand based on crop areas. Therefore the validation run does not provide reliable information on how well the model can represent these demands.
- The validation run omitted Article 21 deliveries. Although this omission will not affect the delivery of 'Table A' volumes south of the Delta, it will affect flow in the Delta and Delta water quality. Also, in the example model run presented in the paper by Draper A.J. et al (2003) which was supplied as part of the review, changes to Article 21 deliveries constituted the largest impact resulting from a change to the allowable pumping capacity at Banks between March and December. This suggests that the modeling of these demands is important.
- The DWR (2003) report produces estimates of SWP and Central Valley Project (CVP) deliveries south of the Delta but then adjusts them for changes in storage before presenting comparisons of those results with observed deliveries. This process merely checks that the model is preserving a water balance and does not present a legitimate validation of model deliveries.
- The report provides statistics on long term average deliveries and flows but no statistics on the fit for individual years. Additional analysis of the output would assist stakeholders to assess whether the estimate of water supply reliability and in particular the modeled volumes of water available in the most restricted years are accurate.
- In some instances, such as the examination of water quality in the Delta, the ability to accurately model monthly flows and deliveries will be important. The validation report contains no information that would enable the ability to model monthly flows to be assessed.
- A key model output is the water quality in the Delta. It would assist the validation of the model if a comparison of parameters such as the location of the X2 boundary was provided.

The users of CALSIM should recognize that models are a summary of what one believes to be true and important about a system. Validation is then an exercise to test how good that summary and understanding really is.

Appendix I contains brief descriptions of calibration modeling in the Murray-Darling Basin in Australia and in the State of Texas.

4.3 Assessment of the reliability of "delivered" water

An important recent application of CALSIM II which has drawn widespread attention is the "State Water Project Delivery Reliability Report. While this is an important step forward in the use of CALSIM for policy purposes, it highlights a number of issues, both conceptual and empirical, that need to be resolved in order to provide a more adequate assessment of the reliability of water supply in California.

First, it illustrates the need for sound calibration of CALSIM. The question being asked is not a comparative one – What are the consequences of changing some aspect of the system from X to Y? – but rather an absolute one – How does the system function at present? How often can users expect a shortage in deliveries of Z%?

Second, it highlights the fact any water system model such as CALSIM requires a blend of hydrology and behavioral analysis. To conduct a water balance, the model needs to know what deliveries are required by the customers of the given project, and what are the diversions by other user groups who extract water from the same surface or groundwater sources. These are fundamentally questions of economic and institutional behavior, not matters of hydrology. Therefore they cannot be dealt with by hydrologists alone. Like its predecessors, CALSIM tends to treat these as black boxes. The diversions by water users outside the CVP-SWP are taken as exogenously given, based on an assumed "level of development" and simplistic assumptions about the patterns of water use associated with that level of development. The deliveries required by the water users who are served by CVP-SWP are generally taken as given. For reasons explained below, both of these treatments are simplistic and unsatisfactory.

In CALSIM modeling exercises the level of development plays two different roles depending upon the context. In a simulation context, the level of development is used to represent hydrologic variability and uncertainty; in a calibration/validation context, it is used to reflect the actual historical demand for water withdrawals. These are very different purposes and it is important to keep them distinct. In most applications of CALSIM prior to the recent reliability study, the main focus was simulation and the representation of hydrologic variability. The chief purpose served by using 73 years of adjusted streamflow records was to represent the variability and uncertainty in the streamflow that one can expect to observe in any single year. Therefore, the calendar date of the record has no substantive significance, the (adjusted) streamflows for 1952 or 1982 are not being used to represented what happened historically in 1952 or 1982, but rather as an indication of the variation in streamflow that could be expected to occur next year, or any other year. In this context of simulating hydrologic variability, it makes good sense to apply the *same* level of development (i.e. the same pattern of water use) to every year in the sequence, rather than a series of different levels of development that vary with calendar time, because the streamflows represent alternative hydrologies that can occur in any given year.[1] The situation is different when one is conducting a calibration or validation

[1] This could be modified to allow for the fact that local weather conditions have a significant impact on irrigation (and urban) demands – e.g., farmers plant fewer acres of crops in a drought year. In that case, one could have different levels of water demand and extraction in different year *types;* but, these would all be keyed to the same overall level of economic development (e.g. the California economy in the 1990s). CALSIM II does not presently

exercise. In that case, one wants to represent the historical demands in 1952 or 1982 in order to compare what the model predicts with what actually happened. Therefore, in a calibration or validation exercise one wants the level of development to change each year in order to reflect the demand that occurred historically.

Both simulation and calibration/validation raise some other important technical issues. In the context of simulation, there are several different ways to generate a hydrologic sequence that is calibrated to a fixed level of development. One can use all 73 years for which data are available. One could use a subset of those years chosen either according to some deterministic rule or randomly. The subset could be oriented, for example, towards the extremes of the 73 sequence of annual records. However, the drawback of any approach based on sampling from the observed historical record is that it *understates* the full variability in streamflow that could be experienced in the future. The 73 years of record are drawings from a probability distribution the extremes of which extend beyond the minimum and maximum flows observed in the historical record. Relying on this record, therefore, understates the true minimum and maximum flows that might be encountered. In a reliability assessment exercise, one might want to take some steps to minimize the potential understatement of streamflow uncertainty. This could be accomplished by fitting a (parametric) probability model to the historical streamflow record and then sampling from the tails of the fitted distribution (Stedinger, 1981). The use of statistical models of streamflow variability could be considered in future applications of CALSIM to assess delivery reliability.

The assessment of delivery reliability requires that particular attention be given to the definition and measurement of the water users' demands. In this context, the user's demands play two roles: they affect the definition of "deliveries" and they influence the assessment of "reliability". With respect to deliveries, CALSIM II considers water to be delivered whenever it has the water irrespective of the ability of a contractor to use the water or to store it; The reality is that, if the contractor does not have a demand for the full quantity of water and is not able to store the excess, that amount will not be delivered. Therefore, the calculation of deliveries would be flawed. Furthermore, reliability cannot be assessed without reference to demand. Stating that a water supply system can deliver 100 acre feet in a wet year but only 70 acre feet in a dry year is useful only if one knows what the demands will be in wet and dry years. The implications are quite different if the user needs 105 acre feet per year than if he or she needs 65 acre feet per year. Thus, the users' demands should serve as the norm against which reliability is assessed. Instead, the recent reliability report uses the so-called 'Table A' water amounts as the norm for assessing deliveries to SWP contractors. This does not seem to be a satisfactory approach because there is no presumption that the Table A amounts, negotiated in 1960, measure the actual demands of SWP contractors in any particular year. The actual demands of the individual contractors will be influenced by how much storage they have, what access they have to other surface water or groundwater, and the demands of the farmers they serve to plant crops and apply water. Without accounting for these factors, it is difficult to generate a meaningful assessment of supply reliability.

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consider the impact of annual weather conditions on demands. In order to model water demands accurately in a year, the climate conditions would be linked to the flow conditions to provide an input set for a particular year.

The assessment of reliability should ideally go beyond a comparison with quantities demanded to incorporate the notion of a loss function. If a user has a demand for 100 acre feet and can only receive 90 acre feet in one scenario and 80 acre feet in another, while the shortfall is twice as large in the second scenario the actual *consequences* of the shortfall to the user, in terms of lost profit or higher cost, might be more than twice as large. To assess the economic value of reliability, or the economic cost of a lack of reliability, one needs to be able translate shortages into monetary losses. To accomplish this, the warning time provided and the delivery shortfalls from CALSIM would need to be processed through an economic model of the value of water to different SWP contractors.

Because water users face difference demands and have access to different sources of supply, when assessing reliability it is unhelpful to aggregate all contractors and simply present the results in terms of total annual project deliveries, as was done in the report. Precisely because of the potential non-linearity of the loss function, a given aggregate shortfall can have different consequences when distributed differently among the individual contractors. A similar observation applies to the temporal distribution of delivery shortfalls across the year. It is unhelpful to aggregate supply system deliveries into an annual total, as done in the report. For a user to be able to obtain 100% of his or her demands in the period from March to May but only 60% in the next three-month period from June to August has different consequences than being able to obtain 80% in each of the six months. Furthermore, for both agricultural users and many urban users, major decisions affecting water use have to be made in the spring. They are based on the expectation around March about the amount of water that will subsequently be available for delivery during the summer months. What matters to these users when assessing supply reliability is the amount of water they can expect around March to be delivered over the summer, rather than the ultimate total delivery.

For both reliability assessment and also model calibration/validation, it is important to avoid excessive aggregation when describing shortfalls between demand and supply, or deviations between model predictions and actual outcomes. In regression analysis, it is the convention to measure the goodness of fit of a regression equation not by the average deviation but rather by the sum of the squared deviations. In ordinary least squares regression, by definition the average deviation is always zero (that is to say, the average of the predicted values of the dependent variable always equals the average of the actual values) regardless of how well or badly the regression equation fits the data. The average deviation thus provides *no* information regarding the goodness of fit; by contrast, the sum of squared deviations or the sum of the absolute values of the deviations are sensitive measures of goodness of fit. Although the calibration of CALSIM is not an exercise in least squares regression, the same general principle applies. To judge whether the model is doing a good job, the goodness of fit should be measured by reference to the disaggregate results and not simply by the overall average deviation.

Additional comments on the 2003 CALSIM II Validation Report are contained in Appendix F.

5. Managing CALSIM Development and Applications

The costs of not continuously and substantially improving our analytical capabilities are political (in terms of continued controversy and diminished agency credibility), economic (as inferior system performance for agricultural and urban water users), environmental (in terms of inferior environmental system performance), and financial (lawyers and policy consultants are more expensive than engineers and scientists).

CALSIM II is a substantial improvement over its predecessor models, DWRSIM and PROSIM, with a great deal more flexibility, transparency, and potential than these earlier models. The modeling team for CALSIM has identified an exciting and relevant vision of how modeling should be done for this complex and difficult system in the coming years. However, implementation of this vision in a coherent technical manner that leads to both technical and stakeholder credibility will be a difficult process, requiring financial and institutional support if this kind of capability is to be developed and sustained.

To accomplish these objectives CALSIM II developers need to be in an institutional position where they can see the model more as "outsiders" view it. This would allow them to be more responsive in supporting the credibility of their work and the relevancy of their tools and results to the broad range of current water management problems. As such CALSIM II should no longer be solely responsible to CVP-SWP managers, but should be responsible to a broader range of technical managers from additional interests, reflecting its current and prospective uses.

It would be imprudent to manage a state's finances, a business, or a retirement plan without quantification – quantification in such matters is necessarily imperfect, but necessary nonetheless. While shortcomings have been identified in CALSIM II, it would be similarly irresponsible to manage California's water budget without carefully-interpreted quantification. Progressive and continuous improvement in our quantitative understanding of California's water system provides a common basis for improving its performance for all interests.

One possible means of maintaining control of the quality of particular versions of CALSIM II and accompanying models used for SWP-CVP planning and management decisions is to create an interagency modeling consortium (IMC) consisting of DWR, USBR, and persons from other stakeholder organizations if they are interested and want to participate. This consortium would be responsible for maintaining a toolbox of 'acceptable' models for 'official' use by the agencies and contractors.

IMC responsibilities and authority could include:

- Prioritize, coordinate, and provide consistency, technical guidance and oversight for all modeling applications,
- Approve model selection and insure that each requested application is carried out using the most appropriate model(s) and input data,
- Provide or otherwise insure documentation of the modeling process itself as well as the modeling results,

- Insure that the results are expressed and made available in a way such that others can understand and benefit from that modeling application, as applicable.
- Implement peer reviews of models and their applications as deemed appropriate.

To help meet their responsibilities the IMC will need to establish, publish and implement some procedures for insuring the quality of the entire model development and application process. They will need to identify among all the models that might be used, which are the most appropriate to address each of these separate groups of model applications. They must identify various models, i.e., establish a model toolbox, from which clients can choose the one that best meets their needs (or perhaps argue that another model should be added to the toolbox). The IMC will also need to maintain model documentation and provide for peer reviews of any model, its documentation, and/or its use in a project.

Further suggestions and discussion on the creation and operation of a possible IMC for model development and application, as well as for managing peer reviews of both the models and their applications, are contained in Appendix E.

6. Recommendations for Future Use, Development, and Application of CALSIM II

The most concise recommendation we might make would be to fix the shortcomings beginning with what are considered the most serious, and proceeding to those that are less serious, taking into account the time and other resources needed to address each weakness. However, we believe it is more useful to suggest ideas on how to systematically address both present shortcomings and those likely to emerge as stakeholders' quantitative understanding of California's water system and its problems continue to evolve.

6.1 Model development and support consortium

As discussed in the previous section and in Appendix E, it might be useful to explore creation of a broader interagency modeling consortium for developing operations planning models for California. The joint DWR-USBR development strategy used for CALSIM II has shown some notable successes, and should be expanded to include additional parties and sources of expertise. Such a consortium might include staffs from several agencies (DWR and USBR, as well as potential members from MWD, KCWA, CCWD, and other agencies), NGOs, some consultants, and universities. Such a model development forum would:

a. Bring a wider range of expertise to bear on model development problems.
b. Facilitate having more agencies involved in supporting model development with expertise and financial resources.
c. Better enable model developers to see the model as "outsiders" see it.
d. Potentially improve contracting for model development and testing.

e. Take model development and testing outside of the explicit agency framework; a broader consortium should be more conducive to self-critical and transparent technical practices.
f. Provide a common training ground for agency, NGO, and consulting staffs to become effective modelers, broadening the talent base for technical work in California.
g. Reduce impediments to model development and testing arising from current State budgetary and personnel hiring problems.

Many of the questions, concerns, and problems mentioned in the user community interviews could be addressed well in such a distributed model development, testing, and support framework. It would still be necessary for each stakeholder group and agency to maintain its own modeling staff, but these would be partially shared in an interagency modeling consortium.

The governance and finance of such a consortium would be difficult and would probably require a steering committee or governing board, but any resulting model(s) would have broader credibility and a broader and deeper technical base.

In the immediate term, a users' group should be formed and the formal listing of model development activities should be posted on the web, including short descriptions of each development activity and contact information.

6.2 Quality Control Program

The DWR and USBR modeling team (or a broader model development consortium) need an explicit quality control program. Such a program should include a variety of activities:

a. periodic external reviews on the broad modeling program
b. specialized external reviews of model products and applications
c. a standing (or sitting) external technical advisory body
d. software engineering and maintenance
e. a regime of model testing
f. model and data documentation
g. data development and management
h. user group activities
i. local agency and interest involvement
j. model, data, and documentation accessibility (including web site use).
k.

Such a quality control program would benefit from deep consultation with stakeholders and the broad community of water technical people, perhaps via the California Water and Environment Modeling Forum (www.cwemf.org).

6.3 A Training Program

DWR, USBR, and assorted agencies and consultants should establish a more formal common regimen to train new CALSIM II users in both CALSIM software and the complexities of actual system operation. All these groups currently rely on a relatively small pool of perhaps a

dozen knowledgeable CALSIM II users and all proclaim a need for many more capable users. A training regimen consisting of current CALSIM II training classes, supplemented by additional training in software application and system operation and apprenticeships or rotations through operations and model development shops would be useful to all concerned. The entire water community would benefit from having such expertise being widespread. Having widespread CALSIM II modeling expertise also makes explaining CALSIM II and its results easier. This might be an appropriate activity for a model development consortium.

6.4 Extend Improvements in Modeling Practice to Supporting Models

CALSIM II is at the center of a web of additional models used by DWR, USBR, and other agencies to prepare inputs for CALSIM II and post-process outputs from CALSIM II.

Delta controversies and difficulties of representation seem endemic to problems of modeling Central Valley operations. The technical basis for representations of Delta operations and water quality performance requires a similar level of transparency and testing to avoid this becoming a "weak link" in the Valley-wide operations planning model. Since so much is based on the DSM2 Delta model, documentation of fairly strenuous tests of the DSM2 model are highly desirable. This would provide a firm foundation for the use of ANN or other approaches for summarizing DSM2 behavior in an operations model. Similar documentation, testing, and development are desirable for the other models mentioned above which provide data for CALSIM II (CVGSM/IGSM, CVPM/CALAG, IWR-MAIN, LCPSIM, CU model, and SIMETAW).

6.5 Hydrologic Data and Data Development

An effort should be made to step back and perhaps re-define a more systematic and solid basis for developing hydrology for water management models of California's inter-tied water system. Currently, several efforts exist to develop surface or groundwater hydrologies for parts of the Central Valley (sponsored by DWR-USBR, USACE-Sacramento District, USEPA, USGS, CALFED, local agencies, etc.). An effort should be made to broaden the range of hydrologic expertise involved in hydrology data development for management modeling of California's inter-tied water system, and establish a consistent and high, but reasonable, standard of documentation and testing for developed data and any underlying hydrologic models. Establishing such a standard of documentation and testing would make existing hydrologic studies more accessible and useful for future studies and encourage the comparison and further development of existing representations of the system's hydrology.

6.7 Performance-Based Optimization

Performance-based optimization should be added to CALSIM's capabilities; it would not be difficult in terms of software or data, and would add much greater ability to explore and seek improvements in management within a complex system. The multi-period optimization approach being developed (CAM) is an operations-oriented first step in this direction, but could be expanded without great difficulty.

For large-scale water resource systems of great complexity and many options for system management, it is often difficult to find "optimal" operations with simulation modeling. There are simply many myriads of decision options and combinations of options, which theoretically each require a simulation model run – which would be prohibitive in terms of analysis cost and time. In such situations, performance-based optimization models, such as those seeking maximum economic performance, can offer useful insights as to where to look for improving system operations and management. Metropolitan Water District of Southern California (MWD) and San Diego County Water Authority (SDCWA) employ performance-based optimization modeling of parts of California's water system to gain strategic insights for planning and management. An economic-engineering optimization model has been developed for California and, despite significant limitations, shows several insights for California (CALVIN), suitable for identifying promising operational and management strategies worthy of more detailed analysis (Jenkins et al. 2001; Draper et al. 2003; Jenkins et al. 2004). The CALSIM II modeling approach could easily be adapted to provide greater functionality to this type of performance optimization. Having performance-based optimization capability together with a compatible simulation model for more detailed analysis and trade-off evaluation could greatly improve the capability of California's water community to explore and develop promising and creative options for improving operations, facilities, and overall system management.

6.8 Modular and Layered Versions of CALSIM II

Speedier versions of CALSIM II are needed for operations planning and integrated water planning studies. Such versions would be regional modules of CALSIM II (for regional studies) or explicitly aggregated system-wide models from the most detailed CALSIM II schematic for system-wide or statewide studies. Both approaches would simplify the model for particular purposes, yet be tied to a common detailed schematic and detailed hydrologic, operations, and water demand data sets.

Geographically modular or aggregated system-wide versions would allow additional local and regional water management options to be represented for particular operations and policy planning purposes and allow users to more quickly explore and develop operating policies. The final runs from such integrated or exploratory studies could then be evaluated using a more detailed and complete version of CALSIM II.

Modular regional models might represent regions with relatively few inter-ties, such as: Sacramento Valley, Delta and eastside streams, San Joaquin Valley, San Francisco Bay Area, Tulare Basin, and Southern California (DWR's South Coast and Colorado River hydrologic regions). (We have had good success with the CALVIN model of California with 5 modular regional models, which combine to form a system-wide model. These geographic sub-models greatly improved quality control in model development, work flow and data checking, and identification of problems in the model.)

6.9 Model Calibration and Testing

Many approaches exist for model calibration and testing (Modeling Forum 2000). Calibrating a planning model oriented to operations in an uncertain and distant future is always challenging. For a model that serves many uses (including policy-urgent uses unforeseen by developers), use-specific testing will often be impossible within a responsive time frame and budget. Such unavoidable situations call for more thorough, general, and well-documented model calibration and testing than would otherwise be needed.

For the model to have technical credibility, stakeholder credibility, and to serve the kind of training and reference function needed for the water management community, a systematic and coherent means of setting parameter values in the model and documenting these values is needed. Similarly, a systematic self-critical means of testing is needed for a model to establish and retain credibility, and have defined limitations, for a range of applications.

A potentially excellent resource for model testing is comparisons of seasonal operations planning CALSIM II model runs with recent years' seasonal operations, as done by actual operators. Similarly, system operators could scrutinize historical simulations, such as those in the recent November report, for systematic differences from operating practice. Such comparison with operator policies and philosophy could also be performed with SWP or CVP delivery reliability estimates. Such comparative analyses would both help define the likely (and unavoidable) differences between actual and modeled operations and water deliveries and identify potential opportunities to narrow such differences.

Credibility arises, in part, from demonstration that problems and limitations are systematically identified and addressed or considered in model development and in making and interpreting model runs. This can be accomplished by use of documentation, metadata, written guidance, and protocols and logs for identifying model problems and recording model improvements.

Given present and anticipated uses of CALSIM II, the model should be calibrated, tested, and documented for "absolute" or non-comparative uses. This is what many applications require today and will be increasingly desired and required in the future. Maintaining the traditional "comparative-only" use of CALSIM II is undesirable if the model is to be useful for the CVP and SWP systems, the operations of water contractors, or for statewide planning purposes.

6.10 Documentation of Model Improvements

Along with better documentation of model versions, logs of data and model improvements and "bug fixes" should be maintained. Explicit protocols and records for identifying and correcting modeling errors and problems would enhance the credibility of the modeling effort with technical people and policy makers. Such protocols also provide an internal aid to staff and staff development in modeling. I understand that this kind of record-keeping is done, but the precise form of, nature, and extent of this record-keeping is unclear. It would be useful and reassuring to stakeholders and policy makers to know that this kind of record-keeping of the software and data was being done.

6.11 Better Model Integration in Decision-Processes and Stakeholder Education

Greater aid should be given to interested parties and decision-makers who must work with the unavoidable limitations of any model. If possible, a document should be prepared for stakeholders and interested parties outlining the model, summarizing the model's primary limitations, and providing guidelines for interpreting model results. Those developing policy-making forums and processes should thoughtfully incorporate computer models in these processes in ways that do not assume model omniscience, or otherwise place too great or exclusive a reliance on model results.

Models and model results will never be perfect. If models are to be important for planning and policy-making, they be must be presented and used in ways that enlighten policy-makers more than they add confusion and controversy to already difficult situations, if possible.

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Appendix A: CALSIM II Science Review

Dates: Nov 13-14th
Location: Bay-Delta Room, CBDA Offices
650 Capitol Mall, 5th Floor
Sacramento, CA

Day 1: The Management Context, Model and Application Details

9:00 Welcome – Kim Taylor
- Overview of the CALFED Bay Delta Program -
- Introduction of the Panel

9:15 Water issues in California – Francis Chung
- General Hydrology
- SWP/CVP
- Operational challenges
- Sacramento-San Joaquin Delta – Ron Ott (5 min.)

9:35 Panel Q&A

9:45 Planning Models – Andy Draper
- CALSIM software
- CALSIM II application overview
- Interaction with other models

10:10 Panel Q&A

10:20 Break

10:30 Summary of CALSIM Applications
- DPLA/CalFed/US Bureau of Reclamation: Integrated Storage Investigations – Steve Roberts
- Bay Delta Office (DWR): SWP Delivery Reliability Report - Kathy Kelly
- USBR: Multi-layered modeling to simulate CVPIA (b)(2) water and Environmental Water Account Operations – Nancy Parker
- Operations Control Office (DWR): Oroville Relicensing, SWP Allocation decision procedure – Curtis Creel
- Department of Planning and Local Assistance (DWR): California Water Plan Update – Kamyar Guivetchi/Ken Kirby

12:15 Panel Q&A

12:30 Lunch

1:15 Summary of User and Stakeholder Interviews
- 1:15 Interview Summary and Findings – UC Davis
- 1:35 Panel Q&A
- 1:50 Public Comment

2:15 CalSim II Details
- Development philosophy – Francis Chung
- Operation priorities, constraints, common assumptions – Erik Reyes
- Hydrology development – Andy Draper
- Delta water quality constraints – Ryan Wilbur

3:15 CalSim Evaluation
- Historical Operations Study / Sensitivity Analysis – Sushil Arora

3:30 Panel Q&A

3:45 Break

4:00 Future Directions
- Data Structure / Version Control / Multi-Period Prescriptive Optimization – Ryan Wilbur
- Daily Time Step - Dan Easton
- CalSim II – CVGSM Integration – Tariq Kadir
- Water Quality / Upstream Models – Nancy Parker

5:00 Panel organizational meeting (additional information needs, questions of specific staff, discussion plan)

Day 2—Panel Deliberations and Preliminary Report

8:30 Panel Q&A with specific DWR and USBR staff on request

9:30 Panel *in camera* discussions

11:00 Panel presentation of draft main findings—Pete Loucks

12:00 Wrap up and next steps - Kim Taylor

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Appendix B: Briefing Material for CALSIM II Peer Review

California Water
Averting a California Water Crisis (3 pages)
California Water Today, Bulletin 160-0, Chapter 2 (20 pages)
Water Supplies, California Water Plan Update, Bulletin 160-98, Chapter 3 (11pages)
Urban, Agricultural and Environmental Water Use, California Water Plan Update, Bulletin 160-98, Chapter 4 (17 pages)
California's Major Water Projects (map) (1 page)

CVP and SWP
State Water Project Operations (6 pages)
Central Valley Project Operations (16 pages)

CalSim and CalSim II Overview
CalSim: A Generalized Model for Reservoir System Analysis (19 pages)

CalSim Software Details
CalSim water resources simulation model: Users guide (18 pages)
CalSim water resources simulation model: Wresl language reference (11 pages)

CalSim II Details
Network Representation (1 page)
Sacramento-San Joaquin Delta Operations (9 pages)
Coordinated Operating Agreement (3 pages)
Reservoir Rule Curves (2 pages)
CalSim ANN Implementation (8 pages)
*CVPIA (b)(2) Management and Operations (6 pages).*ii
EWA Management and Operations (8 pages)
Multi-Cell Groundwater Model (2 pages)
SWP and CVP Delivery Allocation Logic (3 pages)

Hydrology Development
Surface Water Hydrology Development for CalSim II (8 pages)

Supporting Computer Models
Model Interaction (1 page)
CALAG (2 pages)
CU Model (2 pages)
DSM2 (2 pages)
IGSM2 – CVGSM (4 pages)
LCPSIM (5 pages)

CalSim II Evaluation
Planned Sensitivity Analysis (7 pages)
CalSim II Simulation of Historical SWP-CVP Operations - Extracts (61 pages)

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CalSim II Applications
CalSim II Project Applications Summary (not completed)
SWP Delivery Reliability Report – Extracts (25 pages)
North of Delta Offstream Storage Investigations (3 pages)
In-Delta Storage Investigations (3 pages)
California Water Plan Update 2003 (3 pages)
*CalSim II and SWP Operations Control Office (1 page).*iii

Future Model Development

(a) CalSim Software
CalSimMulti-period Prescriptive Optimization (not completed)
CalSim Daily Time Step Model (not completed)
CalSim Water Quality Module (not completed)
Data Structure / Version Control (not completed)
CalSim Graphical User Interface (not completed)

(b) CalSim II Applications
CalSim II – CVGSM Integration (not completed)
CalSim II Geographical Expansion (not completed)
Global Climate Change (not completed)
Refined Spatial Resolution (not completed)
Expansion of Land Use Based Demands (not completed)
CalSim II – CALVIN Integration (not completed)
Revision of Urban Water Demands (not completed)

(c) Supporting Models
Replacement of Consumptive Use Model (not completed)

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Appendix C: CALSIM II Review Process and Timeline

Establishing the Peer Review Panel

Dr. Pete Loucks (Cornell University and South Florida Water Management District) has accepted the CALFED Science Program's invitation to chair the panel. Other members are being currently being contacted by the Science Program staff

Organization of Briefing Material

Science Program and key agency staff, in consultation with the review panel chair, are identifying and organizing briefing material for panel members. Target date for completion is Sept 1, 2003. (This was extended to December 8, 2003)

Public Meeting of Review Panel

Target: 2-day session in November, 2003 in Sacramento area

Review workshop structure will include:

- Presentation overviews of California hydrology, water management, current issues, and the development of CALSIM II
- Presentations on the range of different current and potential applications of CALSIM for planning, operations, and supply reliability projects
- A summary of an independent interview project by Dr. Jay Lund of users and stakeholders explaining the major questions people are trying to answer with CALSIM II and other models
- Public comment to the panel
- Detail discussion of the model, including assumptions used in different applications, verification studies, and sensitivity analyses
- Opportunity for panel members to ask follow up questions of CALSIM developers and users
- An in camera session for panelists to discuss and begin compiling review comments
- A public presentation of the panel's draft findings

Panel Chair Provides Final Report to CALFED Lead Scientist

The panelists will be asked to finalize their review comments within 3 weeks of the public meeting and to transmit those directly to the Lead Scientist. The Science Program will transmit the completed review to CBDA and the CALFED community.

Appendix D: Panelists CALSIM II Review, Nov. 13-14, 2003

Name	Affiliation	Position	Address/Phone/E-mail
Andy Close	Murray Darling Basin Commission	Lead Modeler and System Manager	GPO Box 409 Canberra ACT 2601, AUSTRALIA (02)62790102 andy.close@mdbc.gov.au
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John Labadie	Colorado State University	Professor	B211 Engineering, Fort Collins, CO 80523 (970)491-6898 John.Labadie@colostate.edu
Pete Loucks	Cornell University	Professor	"Civil and Environmental Engineering, 311 Hollister Hall, Ithaca, NY 14853 " (607) 255-4896 DPL3@cornell.edu
Jay Lund	UC Davis	Professor	Civil and Environmental Engineering 3109 Engineering III, Davis, CA 95616" (530)752-5671 jrlund@ucdavis.edu
Daene McKinney	University of Texas at Austin	Professor	Civil and Environmental Engineering Campus Mail Code: C1786, Austin, TX 78712 (512)471-8772 daene_mckinney@mail.utexas.edu
Jery Stedinger	Cornell University	Professor	Civil and Environmental Engineering, Hollister Hall, Ithaca, NY 14853 (607) 255 2351 JRS5@Cornell.edu

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Appendix E: Managing Model Development, Application, Documentation and Communication.

One possible means of maintaining control of the quality of particular versions of CALSIM II and accompanying models used for SWP-CVP planning and management decisions is to create an interagency modeling consortium (IMC) consisting of DWR, USBR, and persons from other stakeholder organizations, including NGOs and universities, if they are interested and want to participate. This consortium would be responsible for maintaining a toolbox of 'acceptable' models for 'official' use by the agencies and contractors.

IMC responsibilities and authority could include:

- Prioritize, coordinate, and provide consistency, technical guidance and oversight for all modeling applications,
- Approve model selection and insure that each requested application is carried out using the most appropriate model(s) and input data,
- Provide or otherwise insure documentation of the modeling process itself as well as the modeling results,
- Insure that the results are expressed and made available in a way such that others can understand and benefit from that modeling application, as applicable.
- Implement peer reviews of models and their applications as deemed appropriate.

To help meet their responsibilities the IMC will need to establish, publish and implement some procedures for insuring the quality of the entire model development and application process. They will need to identify among all the models that might be used, which are the most appropriate to address each of these separate groups of model applications. They must identify various models, i.e., establish a model toolbox, from which clients can choose the one that best meets their needs (or perhaps argue that another model should be added to the toolbox). The IMC will also need to maintain model documentation and provide for peer reviews of any model, its documentation, and/or its use in a project.

CMM Level 3 Performance Expectations

Firms that develop professional software are typically required to meet certain software standards. One such standard is defined in a book from Carnegie Mellon University. These so called Capability Maturity Model (CMM 1994) standards have various levels. For example, the South Florida Water Management District, that develops hydrologic models used as inputs to major investment decisions, strives to meet Level 3 standards. To meet such standards in software development and peer review, one needs to show that

- Modeling related problems are anticipated and prevented

- Model development and application groups work together as an integrated product team.
- Model use training is planned and provided as is needed.
- New modeling methodologies are identified and evaluated for possible implementation on a qualitative basis.
- Data are collected and used in all defined processes.
- Data are systematically shared across various projects.
- Both the models and their applications are evaluated and judged satisfactory by independent reviewers.

It seems to this panel that CALFED could without too much difficulty meet such standards if it chose to. Clearly planning for, conducting, and documenting these activities will require additional time and money. The expectation is that in the long run, such documentation and review will save time and money by redirecting misguided initiatives, identifying alternative approaches, or providing valuable technical support for a potentially controversial decision.

Model Toolbox

The IMC in collaboration with all agencies involved in water resources planning could be responsible for creating and maintaining a collection of models that agencies can use to meet their needs. As shown in Figure 1, this collection of models might be called the model toolbox. The criteria to be used as a basis for deciding whether a proposed model should or should not be included in the toolbox will depend in part on an assessment of the attributes of that model compared to alternative models and the suitability of the model to meet the needs of the project. Associated with the model toolbox is a library of completed model application documents and data bases for use by anyone who could benefit from them.

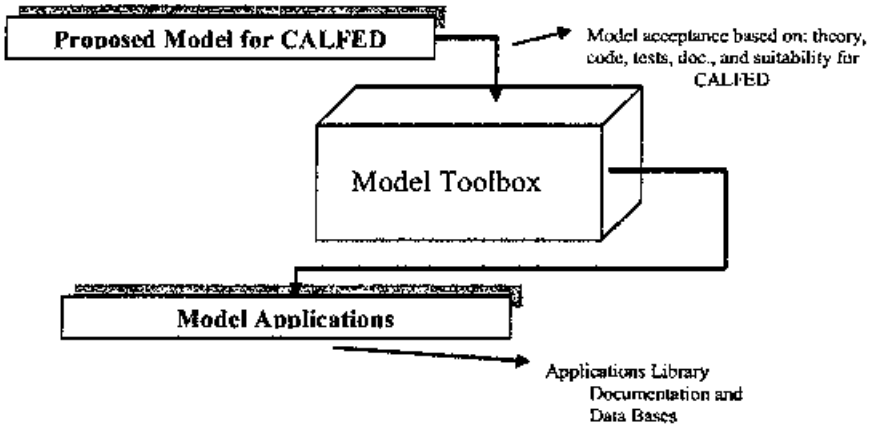

Figure 1. Model Toolbox consisting of approved models for use and Applications Library consisting of documentation and model data bases.

Everyone would agree that all modeling applications should be performed with the 'best' models available. But 'best' does not mean that all models used should be the most detailed, complex, realistic and thus usually the most expensive models available. The decision regarding the 'best' or most appropriate model should be based on the particular issues or questions being addressed, on the quantity and quality of the available input data, and on the time, personnel, and money available to perform the modeling application. The central question to be answered before initiating any modeling application is just what model output information (and precision) is needed to meet the needs of the decision making process. Expressed in other words, just how sensitive will the decision be to the type, amount and precision of the model output?

IMC in consultation with the other agencies could provide guidance on the adequacy of a particular version of CALSIM II or other associated model requested by each client with respect to the theory upon which it is based, its data requirements, its spatial and temporal resolutions, its documentation and status with respect to peer reviews, its capabilities, and its limitations. Similar considerations must be given to the proposed input data. To provide these services to each client requesting services from the IMC would require IMC to be staffed with personnel acquainted with the models in the toolbox, as well as be able to perform or review the simulations requested by various agencies.

There will likely be requests to use models not yet included in the model toolbox. IMC together with others from the DWR and/or USBR will need to judge the merits of such requests and if deemed beneficial, consider including such models in the toolbox. Undoubtedly the extent and quality of the documentation, testing, and peer review of various models in the toolbox will vary. However, a model's inclusion in the toolbox should signify that the model has been judged to be the best available for meeting the goals for which it was designed and is applicable to conditions in California.

Information Flows and Documentation

The IMC will probably be devoting a substantial amount of time giving guidance to clients and, when applicable, to the public. They will need to be working with the clients who are requesting model applications, and in situations where they are not doing this work, they will need to be reviewing and approving the work of the agencies or contractors who are performing the modeling services. IMC would provide technical assistance as well as oversight and coordination among all CALSIM II modeling activities.

Requests for modeling are easy to make, and time and money are required to carry them out. Requests sent to this proposed IMC should reflect some thought by those requesting such model runs as to just why the model application is desired, and just how the results are to be used. We would propose that requests include such items as:

- Reason for modeling,

- Type of modeling (e.g., event based or continuous),
- Particular model preference if any, and why, and possible alternatives,
- Model output information (data) needed and why and when it is needed,
    - What questions are the model results going to answer?
    - What issues are being studied?
    - What decisions are to be made, or at least to be informed, based on these model results?
    - When are the model results needed?
    - What formats are desired for presenting the model results?
- Location or site being modeled and the spatial and temporal scales desired,
- Particular input data assumptions, boundary conditions and other regional assumptions required,
- Source of input data, and format required or desired for the output data,
- Model calibration and verification needs and preferred procedures if any,
- Money and time available for modeling,
- Extent (duration) of the simulations to be performed,
- Desired performance measures, other than variables being simulated, if any,
- Alternative scenarios to be modeled (i.e., number of simulation runs needed),
- Other analyses or model applications that may or will need the output from this model application,
- Sensitivity and uncertainty analyses needed, and for which decision variables and why,
- Client contact person,
- Requirements for intermediate reviews of results or needs for periodic review of modeling application process logs and documents, and
- Other particular requirements or needs.

The use of a model nearly always takes place within a broader context. The model itself can also be part of a larger whole, such as a network of models in which some are using the outputs of other models. These conditions may impose constraints on the simulation modeling project. All these considerations need to be specified in the modeling application request.

Along with the proposal, there should also be a simple order-of-magnitude estimate of the expected values of all relevant decision variables based on simple mass-balance analytical solution methods that can be used without requiring a computer. These estimated values should be used to validate (check the reasonableness of) selected portions of the model runs. If there are any serious discrepancies, it may signify a major problem in the model output.

Is all this paperwork useful? It is to the extent it leads to a more effective and efficient use of personnel, money and time. Preparing a formal modeling application request requires some serious thought as to just why this is necessary and just what information is needed to further the project or analysis. It involves defining the objectives that are to be accomplished. Writing this down in some detail helps reduce the differences in perception that can exist between those who need information and those who are going to provide that information (IMC or a contractor). The problem as stated is often not the problem as understood, by either

the client or the model user. In addition, problem perceptions and modeling objectives can change over the duration of a project. One should ask and answer the question of whether or not modeling in general is the right way to obtain the needed information. What are the alternatives to modeling?

The objective of any modeling project should be clearly understood with respect to the domain and the problem area, the reason for using a particular model, the questions to be answered by the model, the model assumptions and limitations, and the scenarios to be modeled. Throughout the project these objective components should be checked to see if any have changed and if they are being met.

If IMC is to serve as a central point to coordinate CALSIM II-related modeling activities, and to provide modeling services, it needs to have the authority to do so. This authority extends to giving advice on issues related to model and input data selection, and for reviewing, approving and prioritizing requests for services. Should contractors be involved in particular model applications, IMC must be authorized to specify the technical terms to be met and oversee the work done by the contractor. Finally IMC will need the financial and human resources needed to do this in a timely manner.

Modeling Application Documentation

One common problem of model studies once they are underway occurs when one wishes to go back over a series of simulation results to see what was changed or why a particular simulation was made or what was learned. It is also commonly difficult if not impossible for third parties to continue from the point at which any previous modeling project was terminated, especially if some time has passed. These problems are caused by a lack of information on how the study was carried out. What was the pattern of thought that took place? Which actions and activities were carried out? Who carried out what work and why? What choices were made? How reliable are the end results? These questions should be answerable if a model journal is kept. Just like computer programming documentation, modeling project documentation is often neglected under the pressure of time and perhaps because writing it is not as interesting as running the models themselves.

The paper trail of what has happened, what assumptions have been made, how calibration and verification were carried out, what results were obtained, why changes, if any, were made, what sensitivity analysis procedures were used and their results, and so on, could be contained in a modeling application documentation (MAD). Once the model application is completed, a copy of the MAD should be given to the requesting agency, as applicable and a copy should remain in IMC. These reports, or at least a summary of them, should be available for downloading from the web. Should further model applications be requested and approved, the requester as well as the IMC can refer to this previously prepared documentation to better understand what was done previously that pertains to the current request.

Model Calibration

Once a model is tested satisfactorily, it can be calibrated. Calibration of models such as CALSIM II are difficult because there are no historical observations of future scenarios to compare with model results. Historical runs, such as have been made, can provide some basis for calibration. In general the smaller the deviation between the calculated model results and the field observations, the better the model. This is true to a certain extent, as the deviations in a perfect model are only due to measurement errors. In practice, however, a good fit is by no means a guarantee of a good model.

The deviations between the model results and the field observations can be due to a number of factors. These factors include possible software errors, inappropriate modeling assumptions such as the (conscious) simplification of complex structures, neglecting certain processes, errors in the mathematical description or in the numerical method applied, inappropriate parameter values, errors in input data and boundary conditions, and measurement errors in the field observations.

To determine whether or not a calibrated model is a 'good' predictor, it should be validated or verified. Calibrated models should be able to reproduce field observations not used in calibration. Validation can be carried out for calibrated models if an independent data set has been kept aside for this purpose. If all available data are used in the calibration process in order to arrive at the best possible results, validation will not be possible. A decision to leave out validation may be a justifiable one especially when data are limited.

Philosophically it is impossible to know if a simulation model of a complex system is 'correct'. There is no way to prove it. Experimenting with a model, such as by carrying out multiple validation tests, can increase confidence in that model. After a sufficient number of successful tests, one might be willing to state that the model is 'good enough', based on the modeling project requirements. The model can then be regarded as having been validated, at least for the ranges of input data and field observations used in the validation.

If model predictions are to be made for situations or conditions for which the model has been validated, there may be some confidence in the reliability of those predictions. Yet one cannot be certain. Much less confidence can be placed on model predictions for conditions outside the range for which the model was validated.

While a model should not be used for extrapolations as commonly applied in predictions and in scenario analyses, this is often exactly the reason for the modeling project. What is likely to happen given events we have not yet experienced? A model's answer to this question should also include the uncertainties attached to these predictions. Depending on the type of model selected and used, one might end up predicting an incorrect future with great accuracy, or predicting the correct future with great uncertainty'. We don't yet know how to predict the correct future with great accuracy – so we do 'what ifs'. One can then argue about what scenarios – the ifs – are the most reasonable or probable, or about the impacts from improbable scenarios that you want to avoid should such scenarios occur.

Use the model

Once the model has been judged 'good enough,' the model may be used to obtain the information desired. Close communication between the client and the modeler during the modeling application process is essential to avoid any unnecessary misunderstandings about what information is wanted and the assumptions on which that information is to be based.

Before the end of this model-use step one should determine whether all the necessary simulations have been performed and whether they have been performed well. Questions to ask include

- did the model fulfill its purpose?
- are the results valid?
- are the quality requirements met?
- was the discretization of space and time chosen well?
- was the choice of the model restrictions correct?
- was the correct model and/or model program chosen?
- was the numerical approach appropriate?
- was the implementation performed correctly?
- what are the sensitive parameters (and other factors)?
- was an uncertainty analysis performed?

If any of the answers to these questions is no, then the situation should be corrected. If it cannot, the reason(s) for why it cannot be corrected should be documented in the model application document (MAD).

Interpret model results

Interpreting the information resulting from models is a crucial step in the modeling application process, especially in situations in which the client may only be interested in those results and not the way they were obtained. The model results can be compared to those of other similar studies. Are the results consistent? IMC must make that judgment. Any unanticipated results should be discussed and explained. The results should be judged with respect to the modeling project objectives.

The results of any modeling project typically include large files of time-series data. Only the most dedicated of clients will want to read those files. Thus these data must be presented in a more concise form. Statistical summaries should explicitly include any restrictions and uncertainties in the results. They should identify any gaps in the domain knowledge, thus generating new research questions or identifying the need for more field observations and measurements.

Report model results

Once the modeling application is completed, the organization doing the modeling will be responsible for preparing a report. The contents of this report should conform to the agreement

made between modeling organization and the client prior to the initiation of the modeling application (see above). Although the results of a model are very rarely used as the sole basis for policy decisions, those requesting model applications may have a responsibility to translate their model results into policy recommendations. Policymakers, managers, and indeed the participating stakeholders typically want simple and clear unambiguous answers to complex questions. Much of the scientifically justified discussion, say regarding the uncertainties associated with some of the data, included in the main body of a report are not included in the executive summary of that report. This executive summary is often the only part read by those responsible for making decisions. Therefore, the conclusions of the model study must not only be scientifically correct, but also concisely formulated, without jargon, and fully understandable by managers and policymakers. When preparing or reviewing contractor model results reports, the IMC should consider this need.

These model application and model results reports should include sufficient detail to allow others to reproduce the model study (including its results) and/or to proceed from the point where this study ended. The report therefore requires a clear indication of the validity, usability and any restrictions of the model results.

Data Management

CALSIM II and its associated or linked models will require data. They will also produce data. Many of these data will have spatial and temporal dimensions. This information must be documented (meta data), preserved, and made accessible to IMC customers, coordination agencies and others. IMC should participate in data management strategic development, storage, documentation and dissemination. It should work with data base managers of various agencies to help them satisfy the IMC's data management requirements.

The availability of quality assured data is a critical dependency that must be met to facilitate timely completion of model development, implementation and application. To mitigate the impact of the availability of data on the timeline for the major model completion deadlines, the following issues should be addressed. :

- Updating land use / land cover data at regular and timely intervals.
- Developing and maintaining a common modeling database. This data base should include infrastructure design and operating policy data as well as water quality, ecological, land use, economic and of course hydrological data. Many of these data sets will have spatial as well as temporal dimensions. Each data set should have an associated metadata file.
- Pre-processed and post-processed datasets from previous model runs should be archived along with its metadata file in a central location for ease of access and availability.
- Measures to insure the consistency and quality of the input data.
- Measures to insure adequate communication among model developers, users and stakeholders. This includes measures to assist in developing documentation appropriate for each type of stakeholder.

Support of IMC activities

Common failures of IMC type organizations are typically due to:

- Insufficient staff to enable cross-training. This may lead to the dependency on one person or a very small group of employees for each sub module or the overall effort.
- Inadequate funding to institute good project management discipline.
- Inadequate funding to contract for technical writers and software engineers.
- Inadequate funding to contract for peer reviews.

Risk assessments

A risk assessment of CALSIM II and its associated models and data should be completed. The timely availability of quality assured data for example, is a risk. Project risk management includes the processes concerned with identifying, analyzing, and responding to uncertainties. Risk management attempts to minimize the results of adverse events. As a guide, the template, such as shown at the end of this Appendix, may be used to facilitate the assessment of risks.

Problem Management

Given the high visibility and criticality of the CALSIM II modeling effort an issue or problem management process should be developed within IMC. Issue/problem management includes the process for identifying, communicating, and resolving issues and problems.

The purpose of this procedure is to ensure that:

- Issues are identified, reported, managed, and resolved in a timely and effective manner. Responsibility is assigned to an owner for reporting, managing and resolving each issue
- All affected stakeholders are aware of the status of the issues
- Escalation of unresolved issues take place according to a defined procedure

In order to ensure that project issues and problems are appropriately managed various issue/problem management steps should be identified and followed to track the actions taken to resolve the issue or problem throughout the life of a modeling project.

B. Managing Peer Reviews

One means of quality control involves peer reviews of the models, their associated software, and their applications. One possible means of facilitating the peer review processes and for maintaining control on the particular versions of CALSIM II and accompanying models used for SWP-CVP planning and management decisions is another reason to create an interagency modeling consortium (IMC) consisting of DWR, USBR, and other stakeholder organization personnel if they are interested and want to participate. As suggested above, this consortium could be responsible for maintaining a toolbox of 'acceptable' peer-reviewed models for use by the agencies and contractors. The peer reviews should be of the theory underlying each

model, the model's software, the documentation of that software, the model's functions and capabilities including those pertaining to model data input and output, model calibration and verification, sensitivity analyses, uncertainty analyses, user control (GUIs), spatial and temporal resolutions, limiting assumptions, and on the model (as opposed to code) documentation.

Just having evidence of published articles about a particular model in peer reviewed journals is not a substitute for a peer review of the model software and its applicability or suitability for certain types of analyses for SWP-CVP. Peer reviews of all models, their software, and their use should be accomplished by experts both within and outside of the originating agencies. 'Inside' agency (or internal) reviews may uncover some needed changes and identify other issues or problems that external reviewers could be asked to specifically examine and address. Internal reviews can make the external review process more effective, less costly and less time consuming.

Peer reviews are considered a key process area for Level 3 and higher of the Capability Maturity Model guidelines for improving the software process (Carnegie Mellon University, 1994). The purpose of peer review evaluations is to find defects in the model formulation and software and in its use, i.e., model application. Peer reviewers can also identify possible ways of correcting those defects, if any. If there are no defects, or after all known defects have been corrected, both the developers and users of any model and its software can have a stronger basis for believing that their product and its output are reliable.

Peer reviews serve the same function as accountants. Once a firm's financial records have been peer reviewed by accountants (assuming they are qualified, objective and honest) the board of directors as well as the stockholders will have more assurance of the liabilities and net worth of their firm, and just how well it is being managed. In this case it is the assurance of the quality of the models, their software, and on their use in project evaluations, that actual and potential users of the model results depend upon.

The types of problems and issues for which a model, its software, and its documentation are designed to address are called the model's 'application niche'. Peer review of model development should include the evaluation of the intended application niche along with consideration of other aspects of model performance. Users of any model should be aware of the types of analyses for which the model is best suited and those for which the model is not well suited. This, along with the results of a peer review of any model application, should help the potential model user, or the user of the model results, better understand the limitations of the scientific basis of the model and just how much confidence can be placed on the model output.

Peer review triggers

Clearly judgment will have to be exercised as to just when and in what detail a peer review needs to be implemented. However the triggers on when a decision about a peer review needs to be made can be defined.

As shown in Figure 2, decisions regarding peer review are needed when models are proposed for the tool box and when model applications are completed. Should IMC decide a peer review is warranted when either of those events takes place, they will have to decide on the type of review and its level of detail. They will also need to identify the individuals to be asked to carry out that peer review.

Peer reviews are going to take time and cost money. They will also require IMC time to prepare the documentation needed for the peer reviewers and to read and act on reports prepared by the peer reviewers. This will apply if the peer review is internal or external.

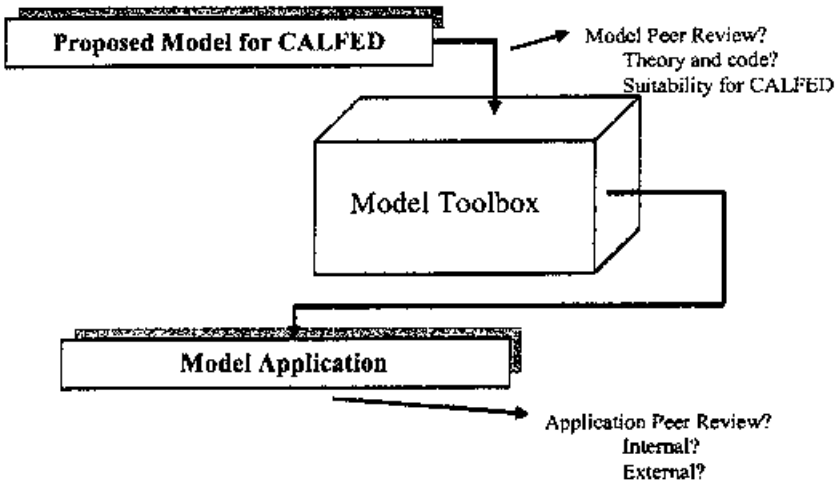

Figure 2. Schematic showing events where a peer review decision can be made.

The particular models and their associated software and documentation to be peer reviewed should be identified by the individuals or departments or agencies. This can include model process descriptions, software source code, documents, test results, and other supporting materials, as needed, for an adequate peer review of the entire model and its software. These products to be reviewed should be identified in writing and a written history of the review of different versions of each item should be maintained.

Events that take place in the progression of model development and use and subsequent modifications that warrant a peer review should be identified and specified in a written document. (This fits in to the model development and use documentation that should be maintained for Level 3 or higher CMM) When these events take place a peer review process should be considered, and if warranted, implemented. Depending on the event, the review can be solely internal, or it can involve an independent external review team as well.

Model application reviews should include an evaluation of the intended model application niche, and its applicability to current needs. Peer review may be appropriate for existing models when new information becomes available that could negate some or all of the conclusions of previous reviews or suggest a change in the currently specified application niche. Peer review of a model's applicability to a particular study should be planned well in advance of when model results are needed. The results of application reviews can influence the decisions made based on the model outputs. Once a peer review has been conducted for a particular model and its input data, peer reviews of subsequent applications of a model with similar inputs might be unnecessary. However, any time the model results may be controversial, or end up in litigation, another peer review may be justified.

Peer Review Process

The extent and process of performing and responding to peer reviews can vary in any organization. The ones discussed in this section attempt to follow the processes recommended by the Capability Maturity Model Level 3 guidelines.

Project peer review process should be specified in writing. A first step in this process should be to identify the particular modeling products and processes that will undergo peer review. This includes the models (i.e. the processes being modeled and the assumptions built into the models for describing these processes), their supporting software, the documentation of the model and its software, as well as all the written guidelines on how the models are to be used.

A second step is to perform an internal peer review prior to a model's use for project evaluation. It should be peer reviewed for accuracy, its suitability for use, and for identifying any possible errors in its logic, its coding, or in its documentation. Following an internal review, an external peer review can be performed.

Following the successful conclusion of internal and external peer reviews of a model and its documentation, the model can be applied to evaluate alternative projects. After the model has been applied to a particular project, the modeling process and its results should be peer reviewed to insure that the model has been applied properly, that the input data were appropriate, and that the conclusions drawn were valid.

Peer review teams should be selected, along with a peer review team leader. The particular personnel on the team will depend on the particular model and its software and documentation being reviewed. CALFED should have a list of qualified peer reviewers representing all applicable disciplines, both internal and external, that it can call upon to perform these reviews. The peer reviews are to be of the models and their use, not of the people who developed or used them. The reviews are to be used to evaluate the quality of modeling products and processes, not of the personnel involved.

Establishing and carrying out ongoing peer review processes costs money. Adequate funding must be made available to

1. identify and recruit a peer review team and team leader
2. prepare and distribute the peer review materials to the peer review team
3. support the time required for the team to review the materials prior to a team meeting
4. support the team meeting and to participate in it as appropriate (e.g., answering questions, conducting model experiments and sensitivity analyses, etc.)
5. reproduce and distribute the team report and to take actions as needed
6. monitor the modifications or changes being made to the model, its software, and its documentation, or redoing the model application, as needed.
7. prepare and distribute to model developers and potential users a report on the results of the peer review and the actions taken.

The particular peer review process may depend on just what is being peer reviewed and the resources and time available to perform the review. In general, however, the steps of a peer review could include the following:

1. DWR or CALFED should identify and establish a pool of possible reviewers representing various disciplines, with sufficient redundancy to allow for scheduling conflicts when ever some subset of those reviewers are needed. This includes both internal as well as external reviewers. What ever administrative work is need to establish this pool should be completed prior to when these reviewers will be needed.

2. At particular milestones in any new model development or in model application an internal peer review process could be initiated, to examine the modeling assumptions, the software that implements those assumptions in the case of model development or the data being used for model inputs in the case of model applications, and the documentation being prepared to describe the processes, to document the software code, and to document the tests that were run to test the code, or to document the results of the model application. If deemed appropriate, an external peer review could also be performed. If an external review is to take place, the particular reviewers need to be selected, notified, sent supporting documents, and be scheduled for one or more meetings, as needed. They should be issued contracts specifying the requirements (the checklist of items to be reviewed) and products expected.

3. Recommendations made by the peer review team need to be addressed and the actions taken along with the rationale for those actions should be documented.

4. The peer review team should review the actions taken and the results obtained from these actions. If not judged acceptable new recommendations should be made and submitted. A final report should be prepared by the peer review team when all recommendations have been successfully implemented or addressed, or if no further actions based on review team's recommendations will be taken by the model developers or users.

The time and effort required for various levels of review should also be assessed and provided to the review team so that they can carry out the level of review requested of them. Otherwise the reviews may be superficial and while appearing to be peer reviewed, a model and its

associated products may in fact be inadequately reviewed. Peer review teams have the responsibility to specify in writing the scope and limitations of their reviews.

As was the case for this peer review panel, the materials to be sent to the review team to allow them to prepare for their meeting should include the statement of review objectives and the level of detail desired, the applicable requirements and standards upon which to judge the adequacy of the products being reviewed, and of course the material that is to be reviewed. There should be a list of questions for the reviewers to address. Each review team member should be assigned and given responsibility for answering specific questions and for completing specific aspects of the overall review. All team members should be given specific review standards or requirements, including the expected completion dates. Checklists should be provided the review team that are applicable to the specific type of product being reviewed and the level of detail to be examined. These checklists will contain the criteria for judging the product, such as compliance with any standards and procedures, completeness, correctness, rules of construction, and maintainability.

Peer Review Issues and Questions

Each model development or application review will dictate its own special set of questions to be addressed. Some of these questions could relate to:

- Model Purpose and Objective
  - Use of model related to decisions being considered.
  - Model application niche, and why.
  - Model strengths and weaknesses –is it the best model?
- Model Processes and Limitations
  - Model processes, spatial and temporal scales, grid resolution.
  - Model variables and level of aggregation.
- Model Theoretical Basis
  - Model algorithms, numerical or analytical methods,
  - Model process formulation
  - Modeling approach in comparison with other models
  - Any shortcomings in relation to application niche
- Model Parameter Estimation
  - Methods used
  - Data available for parameter estimation
  - Parameter estimate reliabilities
  - Boundary conditions and appropriateness.
- Model Input Data Quantity/Quality
  - Data used in design of model
  - Data adequacy (quantity, quality, resolution) for model purpose and application
  - Data necessary for application of model
  - Key data gaps in model application
  - Additional data needs and why
- Model Key Assumptions
  - Basis for major assumptions

- Sensitivity of model outputs to key assumptions
- Sensitivity of potential decisions to key assumptions
- Ease in modifying key assumptions

- Model Performance Measures
  - Criteria for assessing model performance
  - Correspondence of model output with measured observed data
  - Any model bias throughout range of model predictions
  - Variability and uncertainty analyses and representations in model results
  - What determines model's variability and uncertainty.
  - Model performance relative to others in application niche
- Model Documentation and User's Guide
  - Clarity of documentation, comprehensiveness of user's guide
  - Model applicability and limitations
  - Input data requirements for calibration, verification, model runs
  - Post modeling analyses, display and interpretation of results
  - Model code documentation
  - Model application documentation examples for prospective users.
- Review Retrospective
  - How well model and its application meet objectives and needs of project
  - Possible changes in the model to improve model performance
  - Robustness of model solutions to small changes in uncertain parameters, etc.
  - Ease of including uncertainty analyses associated with uncertain input data.
  - Key research needs for model improvement.

Peer Review Completion Reports

Procedures need to be established to track and confirm actions based on suggested changes or modifications in the material being reviewed. Once these actions are taken and completed, and documented, the peer review process for that particular product is completed. Peer review completion reports should contain data on what was reviewed and the results of the review. These data should include a description of the products that were reviewed, the level of detail of the review, any review limitations or qualifications, the number and backgrounds of the reviewers, the time spent preparing for and during review team meetings, the defects found and recommendations made, and the actions taken to address these recommendations.

Overall Peer Review Evaluations

The IMC or initiating agency should document the planning for and scheduling of peer reviews. The products to be reviewed and the level of detail to be examined also need to be specified. The procedures to be followed for selecting peer review team members, and the team leader, should also be determined and documented. Procedures for training potential reviewers, if such training is needed, should be identified and implemented, as required.

Periodically the IMC or applicable agency should assess just how well the plan described in the preceding paragraph is being carried out, and just how beneficial these peer reviews are to the overall modeling effort. Measures should be identified and used to determine the status of the

peer review activities. These measures could include the number of completed peer reviews performed compared to the number expected to be performed, the overall effort expended on peer reviews compared to that expected, and the number and extent of peer review recommendations requiring actions.

At a minimum these periodic reviews should verify that

1. The planned peer reviews and/or audits are conducted.
2. The peer review leaders are adequately trained for their roles.
3. The reviewers are properly trained or experienced in their roles.
4. The processes for preparing for and conducting peer reviews, and for following up on reviewer's recommendations are adequate and are being followed.
5. The reporting of peer review results is complete, accurate, timely and is being made available to model users.

Risk Management Template

Risk Definition Name	Enter a short name that uniquely defines the risk
Risk #	Enter a unique number assigned to the risk. Range starts with 1 and continues.
Date Risk Identified	Enter the date the risk was identified
Risk Identification Source	Enter the source of the risk identification. In example, meeting name, group, or person.
Risk Owner	Enter the name of the person who will be responsible for ensuring the risk is approved, managed, periodically assessed, communicated, and tracked through closed or transfer.
Risk Detailed Description	Enter a detailed description of the risk so that a reader clearly understands the risk.
Probable Impact of Risk on Project (H, M, L)	Enter the impact on the project. o High = the risk will most likely occur and the impact could prevent the project from achieving its purpose. o Medium = there is a 50/50 change the risk would occur and the impact is serious but the project could still achieve its purpose if appropriately managed. o Low = there is a low probability that the risk would occur and minimal impact to the project's purpose.
Probable Impact of Risk on Project Costs	Enter the impact on the project in dollars. Determine what the potential cost to the project would be if the risk occurs.
Probable Impact of Risk on Project Schedule	Enter the schedule impact on the project. Determine how the schedule would be potentially impacted if the risk occurs.
Probable Impact of Risk on Project Results	Enter the impact on the project. Determine how the overall project purpose and results will be potentially impacted if the risk occurs.
Detailed Plan to Mitigate or Transfer Risk	Enter the detailed plan to mitigate the risk or a statement that the risk will be accepted. Mitigation could include ways to minimize, avoid, or transfer the risk to another party or group. Risk transfer would include evidence of agreement by the accepting party.
Detailed Project Action Items Required to Mitigate or Transfer Risk	Enter the detailed action items required to mitigate the risk. These items will be summarized and assigned within the project Action Log, along with an action item owner, and target completion date.
Detailed Project Plan Tasks Required to Mitigate Risk	Enter the detailed project plan task required to mitigate the risk. These items will be summarized and contained within the MS Project Schedule along with the effort, duration, schedule, and assigned resources.
Comments	Enter any permanent comments that cannot be included in the above items.
Referenced Documents	Enter any documents that a reader should consider in understanding, analyzing, mitigating, or accepting this risk.
Date Risk Closed	Enter the date this risk was closed. This would include when all action items or project tasks were completed, or the risk was transferred to another party or group.

Appendix F: Analysis of the November 2003 CALSIM II Validation Report

The following comments come from an analysis of the model results presented in the validation report *'CALSIM II Simulation of Historical SWP/CVP Operations'*, DWR (2003). The observations relate to the formulation of the model at November 2003. Changes might be made to that formulation which could resolve these issues.

Overestimation of Project Deliveries

The validation run suggests that the modeled demands included in CALSIM II overestimate the actual demands. CVP demands south of the Delta are assumed to be always equal to the contract entitlement whereas the observed deliveries in unrestricted years are consistently less than this amount. The modeled North of Delta deliveries are also consistently higher than observed. The modeled and observed CVP deliveries from the validation report are listed in Table 1.

Table 1. Comparison of modelled and observed CVP deliveries (1975–1998)

Project	Simulated Delivery (Taf/yr)	Historical Delivery (taf/yr)	Difference (taf/yr)	% Difference
CVP North of Delta	1960	1750	210	12
CVP South of Delta	2650	2490	160	6.4

Because the SWP south of delta demands were set to historical deliveries in many years, comparison with the historical deliveries in the validation report is of limited validity. However the fact that the historical SWP deliveries over the last ten years have averaged only 2385 taf/year while the modeled 'year 2001 development' SWP Delta deliveries reported in the 2002 State Water Project Delivery Reliability Report average 3090 taf/year, suggests that modeled SWP deliveries may also be too high.

Allocations to Project Contractors

Seasonal allocations to SWP and CVP contractors are made on the basis of water in storage, forecast inflows, projected carryover storage requirements and in-Basin and Delta regulatory requirements. The allocation processes used by the operators and those used by CALSIM II, are not identical. An examination of the way that CALSIM II has restricted project deliveries during the dry period of 1987-1992 (Figures 10, 16, 17 and 24 of the validation report) suggests that CALSIM II has allocated less water in the early years of the dry sequence than occurred in practice and consequently had more water available in 1991 and 1992 when the most severe restrictions were experienced. The carryover storage rules adopted can have a significant impact on the expected frequency and severity of water supply restrictions. The

model rules need to be examined to ensure that the accurately reflect the way the system will be managed in the future.

San Luis Reservoir Operation

The rules used by the system operators for transferring water from headwater storages to the San Luis Reservoir can have a significant impact on:

- the pattern of flow in the Delta,
- the operation of accounting rules between the SWP and the CVP and
- opportunities for SWP wheeling of CVP water and possibly the availability of Article 21 water to SWP contractors.

A comparison of the modeled and observed storage behavior of the SWP component of San Luis (Figure 15) reveals that the model consistently underestimates the volume in storage. A comparison of the CVP component of the storage (Figure 23) indicates that the actual storage is filled earlier in the season and that the actual storage is also slightly higher than the modeled.

Users of CALSIM II output need to be confident that the rules adopted by the model for determining these transfers reflect the way this component of the system will be operated in the future.

Appendix G: Some Principles for Strategic Water Analysis for the California Water Plan Bulletin 160-03 (from the stakeholder review Draft, Sept. 30, 2003)

Strategy:

1) A frequently amended strategic document will lay out DWR's strategic analysis framework and identify the technical objectives, roles, and responsibilities of major DWR data collection efforts and analytical tools and their interactions and their responsible managers.

Transparency:

2) All data and models should be in the public domain and available on the web.
3) All data and models should have significant documentation.
4) Known limitations should be documented.

Longer-term viability:

5) Modularity: Major analytical tools will be designed and implemented to fit modularly and explicitly within the larger strategic analysis framework.
6) Adaptive data management framework: Major data efforts will fall within a larger data management framework, including protocols for data documentation and updating, and documentation of limitations.
7) A frequently-updated document will outline short-term and long-term efforts, budgets, and responsibilities for continuous improvement of analytical tools and data, with policy for continued user, local agency, and stakeholder involvement.

Coverage:

8) Spatial coverage for the basic data and analytical framework will be statewide.
9) Local and regional water management and resources will be explicitly represented.

Accountability and Quality Control:

10) In developing analytical tools, systematic efforts should be made to involve local agencies and stakeholders.
11) Major analytical products will undergo external review by a) external unaffiliated experts and b) local agencies whose systems are included in the model. User groups will exist for all major analytical products.
12) DWR's strategic analysis framework will undergo periodic internal and external review.

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Appendix H: Model Sensitivity and Uncertainty Analysis

(This is a draft of a book chapter by DPL/JRS that may be useful for CALSIM II developers)

1. Introduction

2. Issues, concerns, and terminology

3. Variability and uncertainty in model output
- **3.1 Natural variability**
- **3.2 Knowledge uncertainty**
- **3.3 Decision uncertainty**

4. Sensitivity and uncertainty analyses
- **4.1 Sensitivity Analyses**
- **4.2 Uncertainty Analyses**

5. Performance indicator uncertainties
- **5.1 Performance measure target uncertainty**
- **5.2 Distinguishing differences between performance indicator distributions**

6. Communicating model output uncertainty

7. Conclusions

8. References

The usefulness of any model is in part dependent on the accuracy and reliability of its output data. Yet, because all models are imperfect abstractions of reality, and because precise input data are rarely if ever available, all output values are subject to imprecision. The input data and modeling uncertainties are not independent of each other. They can interact in various ways. The end result is imprecision and uncertainty associated with model output. This chapter focuses on ways of identifying, quantifying, and communicating the uncertainties in model outputs.

1. Introduction

Models are the primary way we have to estimate the multiple affects of alternative water resource system design and operating policies. Models predict the values of various system performance indicators. Model outputs are based on model structure, hydrologic and other time-series inputs and a host of parameters whose values describe the system being simulated. Even if these assumptions and input data reflect, or are at least representative of, conditions believed to be true, we know they will be wrong. Our models are always simplifications of the

real systems we are studying. Furthermore, we simply cannot forecast the future with precision. So we know the model outputs of future conditions are uncertain estimates, at best.

Some prediction uncertainties can be reduced by additional research and data collection and analysis. Before undertaking expensive studies to gather and analyze additional data it is reasonable to ask what improvement in estimates of system performance or what reduction in the uncertainty associated with those estimates would result if all data and model uncertainties could be reduced. Such information helps determine how much one would be willing to 'pay' to reduce prediction uncertainty. If prediction uncertainty on average is costing a lot, it may pay to invest in additional data collection, more studies, or in better models all aimed at reducing that prediction uncertainty. If that uncertainty has no, or only a very modest, impact on the likely decision that is to be made, one should find other issues to worry about.

If it appears that reducing prediction uncertainty is worthwhile, then one should consider how best to do it. If doing this involves obtaining additional information, then it is clear that the value of this additional information, however measured, should exceed the cost of obtaining it. The value of such information will be the increase in system performance, or the reduction in its variance, that one can expect from obtaining such information. If additional information is to be obtained, it should be that information which reduces the uncertainties considered important, not the unimportant ones.

This chapter reviews some methods for identifying and communicating model prediction uncertainty. The discussion begins with a review of the causes of risk and uncertainty in model output. It then examines ways of measuring or quantifying uncertainty and model output sensitivity to model input imprecision, concentrating on methods that seem most relevant or practical for large-scale regional simulation modeling. It builds on some of the statistical methods reviewed in Chapter III and the modeling of risk and uncertainty in Chapter VI.

2. Issues, concerns, and terminology

Outcomes or events that cannot be predicted with certainty are often called risky or uncertain. Some individuals draw a special and interesting distinction between risk and uncertainty. In particular, the term risk is often reserved to describe situations for which probabilities are available to describe the likelihood of various events or outcomes. If probabilities of various events or outcomes cannot be quantified, or if the events themselves are unpredictable, some would say the problem is then one of uncertainty, and not of risk. In this chapter what is not certain is considered uncertain, and uncertainty is often described by a probability distribution. When the ranges of possible events are known and their probabilities are measurable, risk is called objective risk. If the probabilities are based solely on human judgment, the risk is called subjective risk.

Such distinctions between objective and subjective risk, and between risk and uncertainty, rarely serve any useful purpose to those developing and using models. Likewise the distinctions are often unimportant to those who should be aware of the risks or uncertainties associated with system performance indicator values.

Uncertainty in information is inherent in future-oriented planning efforts. Uncertainty stems from inadequate information and incorrect assumptions, as well as from the variability of natural processes. Water managers often need to identify both the uncertainty as well as the sensitivity of, or changes in, system performance indicator values due to the any changes in possible input data and parameter values from what were predicted. They need to reduce this level of uncertainty to the extent practicable. Finally, they need to communicate the residual uncertainties clearly so that decisions can be made with this knowledge and understanding.

Sensitivity analysis can be distinguished from uncertainty analysis. Sensitivity analysis procedures explore and quantify the impact of possible errors in input data on predicted model outputs and system performance indices. Simple sensitivity analysis procedures can be used to illustrate either graphically or numerically the consequences of alternative assumptions about the future. Uncertainty analyses employing probabilistic descriptions of model inputs can be used to derive probability distributions of model outputs and system performance indices. Figure 1 illustrates the impact of both input data sensitivity and input data uncertainty on model output uncertainty.

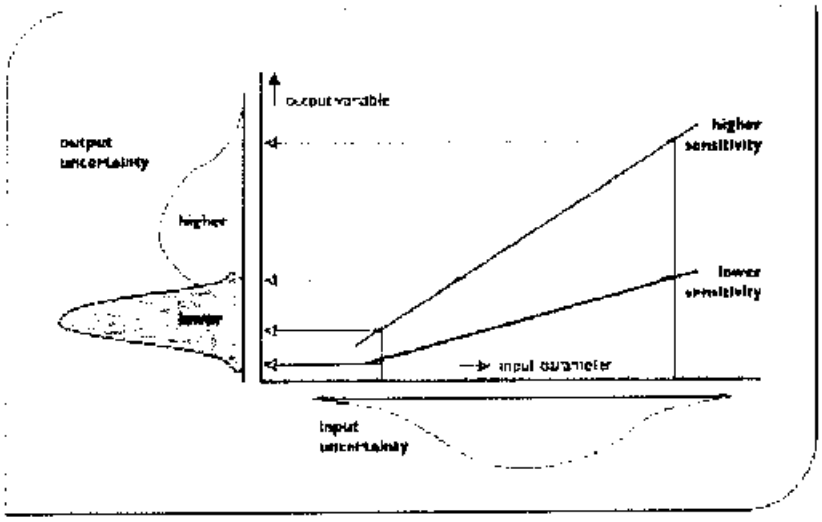

Figure 1. Schematic diagram showing relationship among model input parameter uncertainty and sensitivity to model output variable uncertainty (Lal, 1995).

It is worthwhile to explore the transformation of uncertainties in model inputs and parameters into uncertainty in model outputs when conditions differ from those reflected by the model inputs. Historical records of system characteristics are typically used as a basis for model inputs. Yet conditions in the future may change. There may be changes in the frequency and

amounts of precipitation, changes in land cover and topography, and changes in the design and operation of control structures, all resulting in changes of water stages and flows, and their qualities, and consequently changes in the impacted ecosystems.

If asked how the system would operate with inputs similar to those in the historical database, the model should be able to interpolate within the available knowledge base to provide a fairly precise estimate. Still that estimate will not be perfect. This is because our ability to reproduce current and recent operations is not perfect, though it should be fairly good. If asked to predict system performance for situations very different from those in the historical knowledge base, or when the historical data are not considered representative of what might happen in the future, say due to climate change, such predictions become much less precise. There are two reasons why. First, our description of the characteristics of those different situations or conditions may be imprecise. Second, our knowledge base may not be sufficient for calibrating model parameters in ways that would enable us to reliably predict how the system will operate under conditions unlike those that have been experienced historically. The more conditions of interest are unlike those in the historical knowledge base, the less confidence we have that the model is providing a reliable description of systems operation. Figure 2 illustrates this issue.

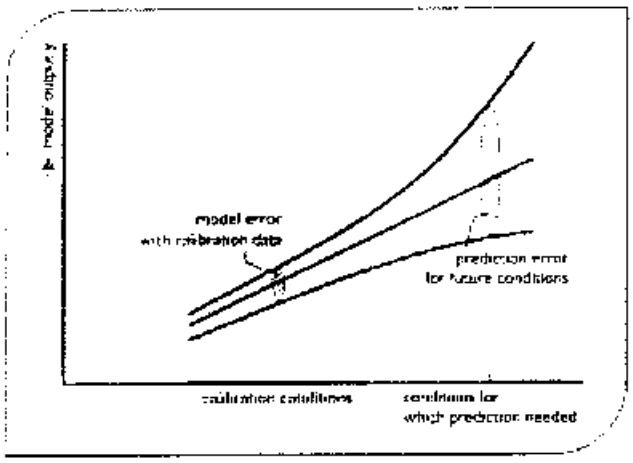

Figure 2. The precision of model predictions is affected by the difference between the conditions or scenarios of interest and the conditions or scenarios for which the model was calibrated.

Clearly a sensitivity analysis needs to consider how well a model can replicate current operations, and how similar the target conditions or scenarios are to those described in the

historical record. The greater the required extrapolation from what has been observed, the greater will be the importance of parameter and model uncertainties.

The relative and absolute importance of different parameters will depend on the system performance indicators of interest. Seepage rates may have a very large local effect, but a small global effect. Changes in system-wide evapotranspiration rates will likely impact system-wide flows. The precision of model projections and the relative importance of errors in different parameters will depend upon the:

(1) precision with which the model can reproduce observed conditions,
(2) difference between the conditions predicted and the historical experience included in the knowledge base, and the
(3) system performance characteristics of interest.

Errors and approximations in input data measurement, parameter values, model structure and model solution algorithms, are all sources of uncertainty. While there are reasonable ways of quantifying and reducing these errors and the resulting range of uncertainty of various system performance indicator values they are impossible to eliminate. Decisions will still have to be made in the face of a risky and uncertain future. Decisions can be modified as new data and knowledge are obtained in a process of adaptive management.

There is also uncertainty with respect to human behavior and reaction related to particular outcomes and their likelihoods, i.e., to their risks and uncertainties. As important as risks and uncertainties associated with human reactions are to particular outcomes, they are not usually part of the models themselves. Social uncertainty may often be the most significant component of the total uncertainty associated with just how a water resource system will perform. For this reason we should seek designs and operating policies that are flexible and adaptable.

When uncertainties associated with system operation under a new operating regime are large, one should anticipate the need to make changes and improvements as experience is gained and new information accumulates. When predictions are highly unreliable, responsible managers should favor actions that are robust (e.g., good under a wide range of situations), gain information through research and experimentation, monitor results to provide feedback for the next decision, update assessments and modify policies in the light of new information, and avoid irreversible actions and commitments.

3. Variability and uncertainty in model output

Differences between model output and observed values can result from either natural variability, say caused by unpredictable rainfall, evapotranspiration, water consumption, and the like, and/or by both known and unknown errors in the input data, the model parameters, or the model itself. The later is sometimes called knowledge uncertainty but it isn't always due to a lack of knowledge. Models are always simplifications of reality and hence 'imprecision' can result. Sometimes imprecision occurs because of a lack of knowledge, such as just how a

particular species will react to various environmental and other habitat conditions. Other times known errors are introduced simply for practical reasons.

Imperfect representation of processes in a model constitutes model structural uncertainty. Imperfect knowledge of the values of parameters associated with these processes constitutes model parameter uncertainty. Natural variability includes both temporal variability and spatial variability, to which model input values may be subject.

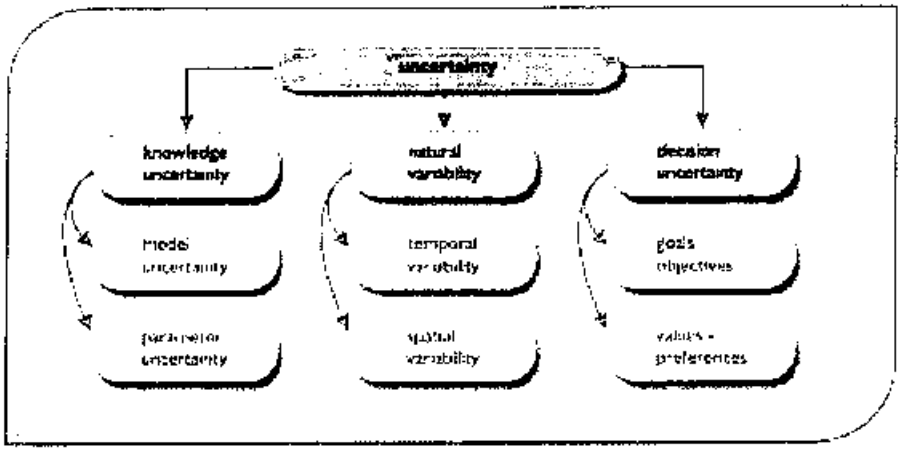

Figure 3. One way of classifying types of uncertainty.

Figure 3 illustrates these different types of uncertainty. For example, the rainfall measured at a weather station within a particular model grid cell may be used as an input value for that cell, but the rainfall may actually vary at different points within that cell and its mean value will vary across the landscape. Knowledge uncertainty can be reduced through further measurement and/or research. Natural variability is a property of the natural system, and is usually not reducible at the scale being used. Decision uncertainty is simply an acknowledgement that we cannot predict ahead of time just what decisions individuals and organizations will make, or even just what particular set of goals or objectives will be considered and the relative importance of each.

Rather than contrasting 'knowledge' uncertainty vs. natural variability vs. decision uncertainty, one can classify uncertainty in another way based on specific sources of uncertainty, such as those listed below, and address ways of identifying and dealing with each source of uncertainty.

Informational Uncertainties:

- imprecision in specifying the boundary and initial conditions that impact the output variable values
- imprecision in measuring observed output variable values

Model Uncertainties:

- uncertain model structure and parameter values
- variability of observed input and output values over a region smaller than the spatial scale of the model
- variability of observed model input and output values within a time smaller than the temporal scale of the model. (e.g., rainfall and depths and flows within a day)
- errors in linking models of different spatial and temporal scales

Numerical Errors:

- errors in the model solution algorithm

3.1 Natural variability

The main source of hydrologic model output value variability is the natural variability in hydrological and meteorological input series. Periods of normal precipitation and temperature can be interrupted by periods of extended drought and intense meteorological events such as hurricanes and tornadoes. There is no reason to think such events will not continue to occur and become even more frequent and extreme. Research has demonstrated that climate has been variable in the past and concerns about anthropogenic activities that may increase that variability increase each year. Sensitivity analysis can help assess the affect of errors in predictions if those predictions are based only on past records of historical time-series data describing precipitation, temperature and other exogenous forces across and on the border of the regions being studied.

Time series input data are often actual, or at least based on, historical data. The time-series values typically describe historical conditions including droughts and wet periods. What is distinctive about natural uncertainty, as opposed to errors and uncertainty due to modeling limitations, is that natural variability in meteorological forces cannot be reduced by improving the model's structure, increasing the resolution of the simulation, or by better calibration of model parameters.

Errors result if meteorological values are not measured or recorded accurately, or if mistakes are made in the generation of computer data files. Furthermore, there is no assurance the statistical properties of historical data will accurately represent the statistical properties of future data. Actual future precipitation and temperature scenarios will be different from those in the past, and this difference in many cases may have a larger affect than the uncertainty due to incorrect parameter values. However, the affects of uncertainties in the parameter values

used in stochastic generation models are often much more significant than the affects of using different stochastic generation models (Stedinger and Taylor, 1982).

While variability of model output is a direct result of variability of model input (e.g., hydrologic and meteorological data), the extent of the variability, and the lower and upper limits of that variability, may also be affected by errors in the inputs, the values of parameters, initial boundary conditions, model structure, processes and solution algorithms.

Figure 4 illustrates the distinction between the variability of a system performance indicator due to input data variability, and the extended range of variability due to the total uncertainty associated with any combination of the causes listed in the previous section. This extended range is what is of interest to water resource planners and managers.

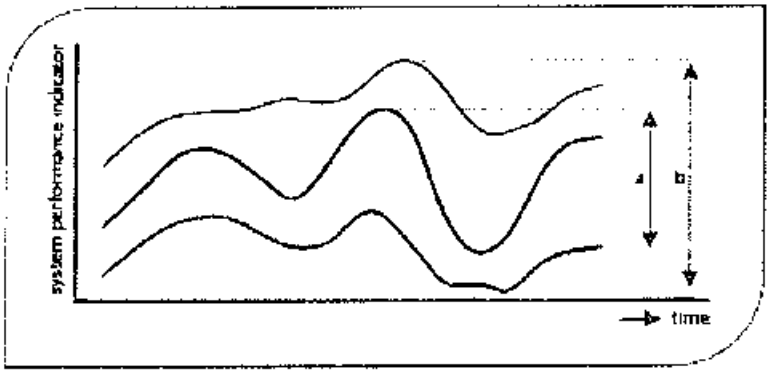

Figure 4. Time-series of model output or system performance showing variability over time. Range "a" results from the natural variability of input data over time. The extended range "b" results from the variability of natural input data as well as from imprecision in input data measurement, parameter value estimation, model structure and errors in model solution algorithms. The extent of this range will depend on the confidence level associated with that range.

What can occur in practice is a time-series of system performance indicator values that can range anywhere within or even outside the extended range, assuming the confidence level of that extended range is less than 100%. The confidence one can have that some future value of a time series will be within a given range is dependent on two factors. The first is the number of measurements used to compute the confidence limits. The second is on the assumption that those measurements are representative of - come from the same statistical or stochastic process yielding - future measurements. Figure 5 illustrates this point. Note that the time series may even contain values outside the range "b" defined in Figure 4 if the confidence level of that range is less than 100%. Confidence intervals associated with less than 100% certainty will not include every possible value that might occur.

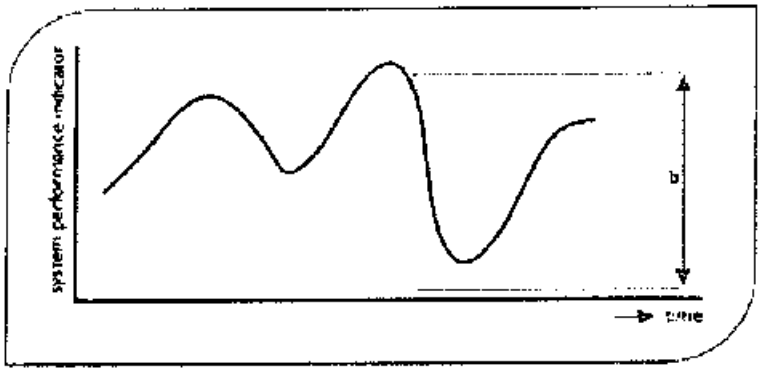

Figure 5. Typical time series of model output or system performance indicator values that are the result of input data variability and possible imprecision in input data measurement, parameter value estimation, model structure and errors in model solution algorithms.

3.2 Knowledge uncertainty

Referring to Figure 3, knowledge uncertainty includes model structure and parameter value uncertainties. First we consider parameter value uncertainty including boundary condition uncertainty, and then model and solution algorithm uncertainty.

3.2.1 Parameter value uncertainty

A possible source of uncertainty in model output results from uncertain estimates of various model parameter values. If the model calibration procedure were repeated using different data sets, different parameter values would result. Those values would yield different simulated system behavior, and thus different predictions. We can call this parameter uncertainty in the predictions because it is caused by imprecise parameter values. If such parameter value imprecision were eliminated, then the prediction would always be the same and so the parameter value uncertainty in the predictions would be zero. But this does not mean that predictions would be perfectly accurate.

In addition to parameter value imprecision, uncertainty in model output can result from imprecise specification of boundary conditions. These boundary conditions can be either fixed or variable. However, because they are not being computed based on the state of the system, their values can be uncertain. These uncertainties can affect the model output, especially in the vicinity of the boundary, in each time step of the simulation.

3.2.2 Model structural and computational errors

Uncertainty in model output can also result from errors in the model structure compared to the real system, and approximations made by numerical methods employed in the simulation. No matter how good our parameter value estimates, our models are not perfect and there is a residual model error. Increasing model complexity to more closely represent the complexity of the real system may not only add to the cost of data collection, but also introduce even more parameters, and thus even more potential sources of error in model output. It is not an easy task to judge the appropriate level of model complexity, and to estimate the resulting levels of uncertainty associated with various assumptions regarding model structure and solution methods. Kuczera (1988) provides an example of a conceptual hydrologic modeling exercise with daily time steps where model uncertainty dominated parameter value uncertainty.

3.3 Decision uncertainty

Uncertainty in model predictions can result from unanticipated changes in what is being modeled. These can include changes in nature, human goals, interests, activities, demands, and impacts. An example of this is the deviation from standard or published operating policies by operators of infrastructure such as canal gates, pumps, and reservoirs in the field, as compared to what is specified in documents and incorporated into the water systems models. Comparing field data with model data for model calibration may yield incorrect calibrations if operating policies actually implemented in the field differ significantly from those built into the models. What do operators do in times of stress? And can anyone identify a place where deviations from published policies do not occur?

What humans will want to achieve in the future may not be the same as what they want today. Predictions of what people will want in the future are clearly sources of uncertainty. A perfect example of this is in the very flat Greater Everglades region of south Florida in the US. Fifty years ago folks wanted the swampy region protected from floods and drained for agricultural and urban development. Today many want just the opposite at least where there are no human settlements. They want to return to a more natural hydrologic system with more wetlands and unobstructed flows, but now for ecological restoration objectives that were not a major concern or much appreciated some half a century ago. Once the mosquitoes return and if the sea level continues to rise, future populations who live there may want more flood control and drainage again. Who knows? Complex changing social and economic processes influence human activities and their demands for water resources and environmental amenities over time. Some of these processes reflect changes in local concerns, interests and activities, but population migration and many economic activities and social attitudes can also reflect changing national and international trends.

Sensitivity scenarios that include human activities can help define the affects of those activities within an area. It is important that careful attention go into the development of these alternative scenarios so that they realistically capture the forces or stresses that the system may face. The history of systems studies are full of examples where the issues studied were rapidly

overwhelmed by much larger social forces resulting from, for example, the relocation of major economic activities, an oil embargo, changes in national demand for natural resources, economic recession, sea-level rise, an act of terrorism, or even war. One thing is sure; the future will be different than the past, and no one is certain just how.

3.3.1 Surprises

Water resource managers may also want to consider how vulnerable a system is to undesirable environmental surprises. What havoc might an introduced species like the zebra mussel invading the Great Lakes of North America have in a particular watershed? Might some introduced disease suddenly threaten key plant or animal species? Might management plans have to be restructured to address the survival of some species such as salmon in the Rhine River in Europe or in the Columbia River in North America? Such uncertainties are hard to anticipate when by their nature they are truly surprises. But surprises should be expected. Hence system flexibility and adaptability should be sought to deal with changing management demands, objectives, and constraints.

4. Sensitivity and uncertainty analyses

An uncertainty analysis is not the same as a sensitivity analysis. An uncertainty analysis attempts to describe the entire set of possible outcomes, together with their associated probabilities of occurrence. A sensitivity analysis attempts to determine the relative change in model output values given modest changes in model input values. A sensitivity analysis thus measures the change in the model output in a localized region of the space of inputs. However, one can often use the same set of model runs for both uncertainty analyses and sensitivity analyses. It is possible to carry out a sensitivity analysis of the model around a current solution and then use it as part of a first order uncertainty analysis.

This discussion begins by focusing on some methods of uncertainty analysis. Then various ways of performing and displaying sensitivity analyses are reviewed.

4.1 Uncertainty Analyses

Recall that uncertainty involves the notion of randomness. If a value of a performance indicator or performance measure, or in fact any variable, like the phosphorus concentration or the depth of water at a particular location varies and this variation over space and time cannot be predicted with certainty, it is called a random variable. One cannot say with certainty what the value of a random variable will be but only the likelihood or probability that it will be within some specified range of values. The probabilities of observing particular ranges of values of a random variable are described or defined by a probability distribution. There are many types of distributions and each can be expressed in several ways as presented in Chapter III.

Suppose the random variable is X. If the observed values of this random variable can be only discrete values, the probability distribution of X can be expressed as a histogram, as shown in Figure 6a. The sum of the probabilities for all possible outcomes must equal 1. If the random variable is a continuous variable that can assume any real value over a range of values, the probability distribution of X can be expressed as a continuous distribution as shown in Figure 6b. The shaded area under the density function for the continuous distribution is 1. The area between two values of the continuous random variable, such as between u and v in Figure 6c, represents the probability that the observed value x of the random variable value X will be within that range of values.

The probability distribution, $P_X(x)$ shown in Figure 6 (a) is called a probability mass function. The probability distributions shown in Figure 6 (b and c) are called a probability density functions (pdf) and are denoted by $f_X(x)$. The subscript X of P_X and f_X represents the random variable, and the variable x is some value of that random variable X.

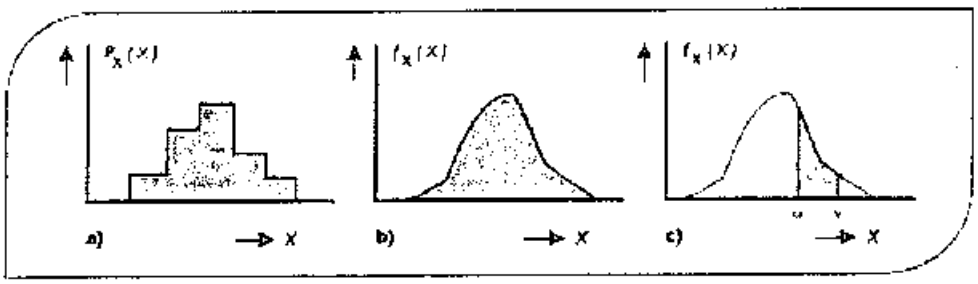

Figure 6. Probability distributions for a discrete or continuous random variable X. The area under the distributions (shaded areas in a and b) is 1, and the shaded area in c is the probability that the observed value x of the random variable X will be between u and v.

Uncertainty analyses involve identifying characteristics of various probability distributions of model input and output variables, and subsequently functions of those random output variables that are performance indicators or measures. Often targets associated with these indicators or measures are themselves uncertain.

A complete uncertainty analysis would involve a comprehensive identification of all sources of uncertainty that contribute to the joint probability distributions of each input or output variable. Assume such analyses were performed for two alternative project plans, A and B, and that the resulting probability density distributions for a specified performance measure were as shown in Figure 7. Figure 7 also identifies the costs of these two projects. The introduction of two performance criteria, cost and probability of exceeding a performance measure target (e.g., a pollutant concentration standard) introduces a conflict where a tradeoff must be made.

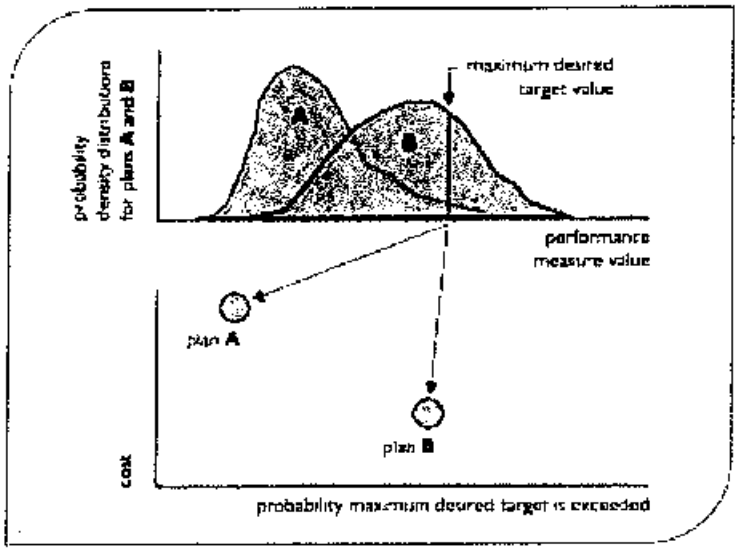

Figure 7. Tradeoffs involving cost and the probability that a maximum desired target value will be exceeded. In this illustration we want the lowest cost (*B* is best) and the lowest probability of exceedance (*A* is best).

4.1.1 Model and model parameter uncertainties

Consider a situation as shown in Figure 8, in which for a specific set of model inputs, the model outputs differ from the observed values, and for those model inputs, the observed values are always the same. Here nothing randomly occurs. The model parameter values or model structure needs to be changed. This is typically done in a model calibration process.

Given specific inputs, the outputs of deterministic models are always going to be the same each time those inputs are simulated. If for specified inputs to any simulation model the predicted output does not agree with the observed value, as shown in Figure 8, this could result from imprecision in the measurement of observed data. It could also result from imprecision in the model parameter values, the model structure, or the algorithm used to solve the model.

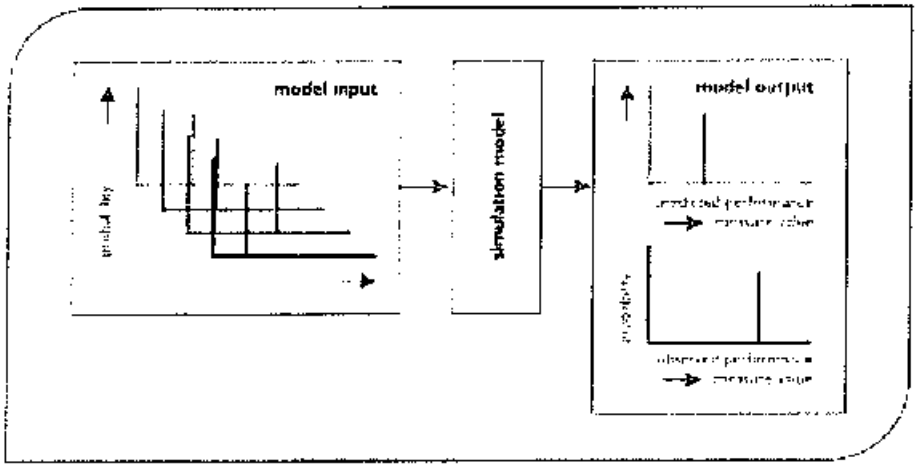

Figure 8. A deterministic system and a simulation model of that system needing calibration or modification in its structure. There is no randomness, only parameter value or model structure errors to be identified and corrected.

Next consider the same deterministic simulation model but now assume at least some of the inputs are random, i.e., not predictable, as may be case when random outputs of one model are used as inputs into another model. Random inputs will yield random outputs. The model input and output values can be described by probability distributions. If the uncertainty in the output is due only to the uncertainty in the input, the situation is similar to that shown in Figure 8. If the distribution of performance measure output values does not fit or is not identical to the distribution of observed performance measure values, then calibration of model parameter values or modification of model structure may be needed.

If a model calibration or 'identification' exercise finds the 'best' values of the parameters to be outside reasonable ranges of values based on scientific knowledge, then the model structure or algorithm might be in error. Assuming the algorithms used to solve the models are correct and observed measurements of system performance vary for the same model inputs, as shown in Figure 9, it can be assumed that the model structure does not capture all the processes that are taking place that impact the value of the performance measures. This is often the case when relatively simple and low-resolution models are used to estimate the hydrological and ecological impacts of water and land management policies. However, even large and complex models can fail to include or adequately describe important phenomena.

In the presence of informational uncertainties there may be considerable uncertainty about the values of the "best" parameters during calibration. This problem becomes even more pronounced with increases in model complexity.

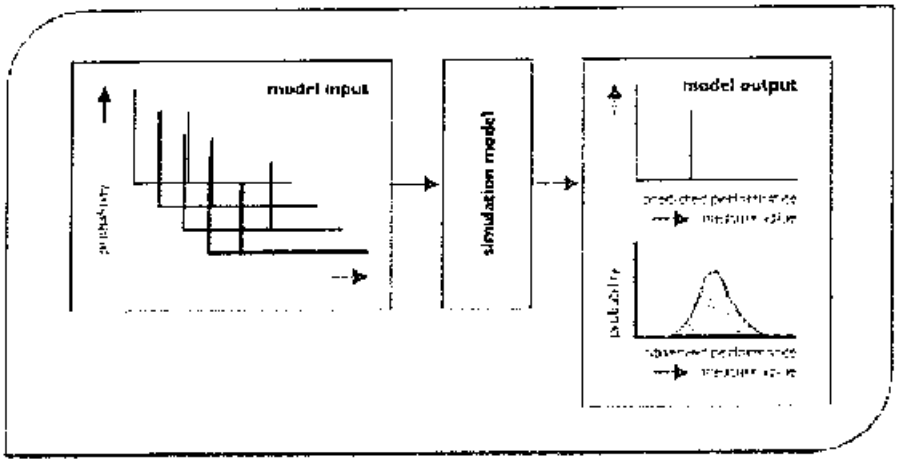

Figure A deterministic simulation model of a 'random or stochastic' system. To produce the variability in the model output that is observed in the real system, even given the same input values, the model's parameter values may need to vary over distributions of values and/or the model structure may need modification along with additional model inputs.

An example: Consider the prediction of a pollutant concentration at some site downstream of a pollutant discharge site. Given a streamflow Q (in units of 1000 m^3/day), the distance between the discharge site and the monitoring site, X (m), the pollutant decay rate constant k (day^{-1}), and the pollutant discharge W (Kg/day), we can use the following simplified model to predict the concentration of the pollutant C (g/m^3 = mg/l) at the downstream monitoring site:

$$C = (W/Q) \exp\{-k(X/U)\}$$

In the above equation assume the velocity U (m/day) is a known function of the streamflow Q.

In this case the observed value of the pollutant concentration C may differ from the computed value of C even for the same inputs of W, Q, k, X, and U. Furthermore, this difference varies in different time periods. This apparent variability, as illustrated in Figure 9, can be simulated using the same model but by assuming a distribution of values for the decay rate constant k. Alternatively the model structure can be modified to include the impact of streamflow temperature T on the prediction of C.

$$C = (W/Q) \exp\{-k\theta^{T-2}(X/U)\}$$

Now there are two model parameters, the decay rate constant k and the dimensionless temperature correction factor θ and an additional model input, the streamflow temperature, T. It could be that the variation in streamflow temperature was the sole cause of the first

equation's 'uncertainty' and that the assumed parameter distribution of k was simply the result of the distribution of streamflow temperatures on the term $k\theta^{T-20}$.

If the output were still random given constant values of all the inputs, then another source of uncertainty exists. This uncertainty might be due to additional random loadings of the pollutant, possibly from non-point sources. Once again the model could be modified to include these additional loadings if they are knowable. Assuming these additional loadings are not known, a new random parameter could be added to the input variable W or to the right hand side of the equations above that would attempt to capture the impact on C of these additional loadings. A potential problem, however, might be the likely correlation between those additional loadings and the streamflow Q.

While adding model detail removed some 'uncertainty' in the above example, increasing model complexity will not always eliminate or reduce uncertainty in model output. Adding complexity is generally not a good idea when the increased complexity is based on processes whose parameters are difficult to measure, the right equations are not known at the scale of application, or the amount of data for calibration is small compared to the number of parameters.

Even if more detailed models requiring more input data and more parameter values were to be developed, the likelihood of capturing all the processes occurring in a complex system is small. Hence those involved will have to make decisions taking this uncertainty into account. Imprecision will always exist due to less than a complete understanding of the system and the hydrologic processes being modeled. A number of studies have addressed model simplification, but only in some simple cases have statisticians been able to identify just how one might minimize modeling related errors in model output values.

The problem of determining the "optimal" level of modeling detail is particularly important when simulating the hydrologic events at many sites over large areas. Perhaps the best approach for these simulations is to establish confidence levels for alternative sets of models and then statistically compare simulation results. But even this is not a trivial or costless task. Increases in the temporal or spatial resolution typically require considerable data collection and/or processing, model recalibrations, and possibly the solution of stability problems resulting from the numerical methods used in the models. Obtaining and implementing alternative hydrologic simulation models will typically involve considerable investments of money and time for data preparation and model calibration.

What is needed is a way to predict the variability evident in the system shown in Figure 9. Instead of a fixed output vector for each fixed input vector, a distribution of outputs are needed for each performance measure based on fixed inputs (Figure 9) or a distribution of inputs (Figure 10.). Furthermore the model output distribution for each performance measure should 'match' as well as possible the observed distribution of that performance measure.

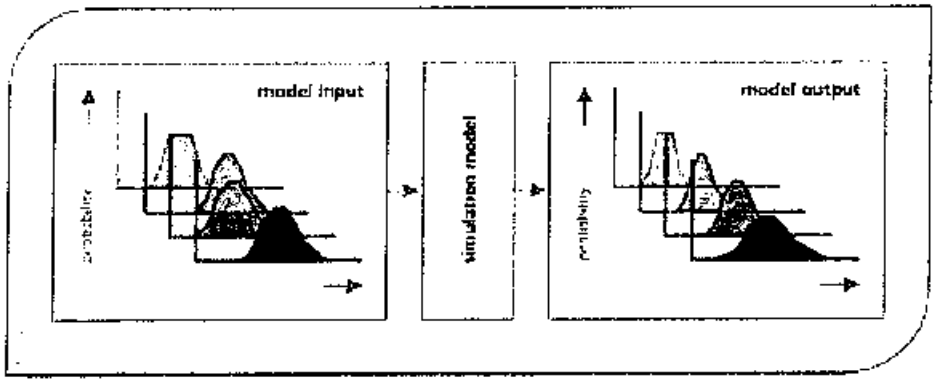

Figure 10. Simulating variable inputs to obtain probability distributions of predicted performance indices that match the probability distributions of observed performance values.

4.1.2 What uncertainty analysis can provide

An uncertainty analysis takes a set of randomly chosen input values (that can include parameter values), passes them through a model (or transfer function) to obtain the distributions (or statistical measures of the distributions) of the resulting outputs. As illustrated in Figure 11, the output distributions can be used to

- Describe the range of potential outputs of the system at some probability level.
- Estimate the probability that the output will exceed a specific threshold or performance measure target value.

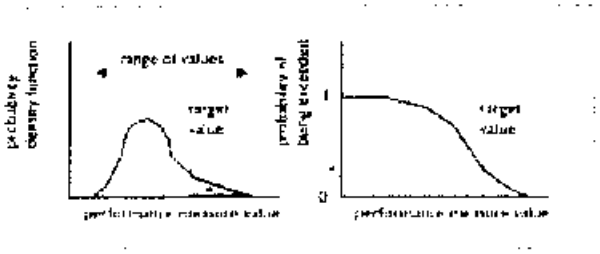

Figure 11. The distribution of performance measures defines range of potential values and the likelihood that a specified target value will be exceeded. The shaded area under the density function on the left represents the probability that the target value will be exceeded. This probability is shown in the probability of exceedance plot on the right.

Common uses for uncertainty analyses are to make general inferences, such as the following:

- Estimating the mean and standard deviation of the outputs.
- Estimating the probability the performance measure will exceed a specific threshold.
- Putting a reliability level on a function of the outputs, e.g., the range of function values that is likely to occur with some probability.
- Describing the likelihood of different potential outputs of the system.

Implicit in any uncertainty analysis are the assumptions that statistical distributions for the input values are correct and that the model is a sufficiently realistic description of the processes taking place in the system. Neither of these assumptions is likely to be entirely correct.

4.2 Sensitivity analyses

"Sensitivity analysis" is aimed at describing how much model output values are affected by changes in model input values. It is the investigation of the importance of imprecision or uncertainty in model inputs in a decision making or modeling process. The exact character of sensitivity analysis depends upon the particular context and the questions of concern. Sensitivity studies can provide a general assessment of model precision when used to assess system performance for alternative scenarios, as well as detailed information addressing the relative significance of errors in various parameters. As a result, sensitivity results should be of interest to the general public, federal and state management agencies, local watershed planners and managers, model users, and model developers.

Clearly, upper level management and the public may be interested in more general statements of model precision, and should be provided such information along with model predictions. On the other hand, detailed studies addressing the significance and interactions among individual parameters would likely be meaningful to model developers and some model users. They can use such data to interpret model results and to identify where efforts to improve models and their input values should be directed.

Initial sensitivity analysis studies could focus on two products:

(1) detailed results to guide research and assist model development efforts, and
(2) calculation of general descriptions of uncertainty associated with model predictions so that policy decisions can reflect both the modeling efforts best prediction of system performance and the precision of such predictions.

In the first case, knowing the relative uncertainty in model projections due to possible errors in different sets of parameters and input data should assist in efforts to improve the precision of model projections. This knowledge should also contribute to a better understanding of the relationships between model assumptions, parameters, data and model predictions.

For the second case, knowing the relative precision associated with model predictions should have a significant effect on policy development. For example, the analysis may show that, given data inadequacies, there are very large error bands associated with some model variables. When such large uncertainties exist, predictions should be used with appropriate skepticism.

Incremental strategies should be explored along with monitoring so that greater experience can accumulate to resolve some of those uncertainties.

Sensitivity analysis features are available in many linear and nonlinear programming (optimization) packages. They identify the changes in the values of the objective function and unknown decision variables given a change in the model input values, and a change in levels set for various constraints (Chapter V). Thus sensitivity analysis addresses the change in "optimal" system performance associated with changes in various parameter values, and also how "optimal" decisions would change with changes in resource constraint levels, or target output requirements. This kind of sensitivity analysis provides estimates of how much another unit of resource would be worth, or what "cost" a proposed change in a constraint places on the optimal solution. This information is of value to those making design decisions.

Various techniques have been developed to determine how sensitive model outputs are to changes in model inputs. Most approaches examine the affects of changes in a single parameter value or input variable assuming no changes in all the other inputs. Sensitivity analyses can be extended to examine the combined effects of multiple sources of error, as well.

Changes in particular model input values can affect model output values in different ways. It is generally true that only a relatively few input variables dominate or substantially influence the values of a particular output variable or performance indicator at a particular location and time. If the range of uncertainty of only some of the output data is of interest, then undoubtedly only those input data that significantly impact on the values of those output data need be included in the sensitivity analysis.

If input data estimates are based on repeated measurements, a frequency distribution can be estimated that characterizes natural variability. The shorter the record of measurements, the greater will be the uncertainty regarding the long-term statistical characteristics of that variability. If obtaining a sufficient number of replicate measurements is not possible, subjective estimates of input data ranges and probability distributions are often made. Using a mixture of subjective estimates and actual measurements does not affect the application of various sensitivity analysis methods that can use these sets or distributions of input values, but it may affect the conclusions that can be drawn from the results of these analyses.

It would be nice to have available accurate and easy-to-use analytical methods for relating errors in input data to errors in model outputs, and to errors in system performance indicator values that are derived from model output. Such analytical methods do not exist for complex simulation models. However methods based on simplifying assumptions and approximations can be used to yield useful sensitivity information. Some of these are reviewed in the remainder of this chapter.

4.2.1 Sensitivity coefficients

One measure of sensitivity is the sensitivity coefficient. This is the derivative of a model output variable with respect to an input variable or parameter. A number of sensitivity

analysis methods use these coefficients. First-order and approximate first-order sensitivity analyses are two such methods that will be discussed later. The difficulty of

1. obtaining the derivatives for many models,
2. needing to assume mathematical (usually linear) relationships when obtaining estimates of derivatives by making small changes of input data values near their nominal or most likely values, and
3. having large variances associated with most hydrologic process models have motivated the replacement of analytical methods by numerical and statistical approaches to sensitivity analysis.

Implicit in any sensitivity analysis are the assumptions that statistical distributions for the input values are correct and that the model is a sufficiently realistic description of the processes taking place in the system. Neither of these assumptions is likely to be entirely correct.

The importance of the assumption that the statistical distributions for the input values are correct is easy to check by using different distributions for the input parameters. If the outputs vary significantly, then the output is sensitive to the specification of the input distributions and hence they should be defined with care. A relatively simple deterministic sensitivity analysis can be of value here (Benaman, 2002). A sensitivity coefficient can be used to measure the magnitude of change in an output variable Q per unit change in the magnitude of an input parameter value P from its base value P_o. Let SI_{PQ} be the sensitivity index for an output variable Q with respect to a change ΔP in the value of the input variable P from its base value P_o. Noting that the value of the output $Q(P)$ is a function of P, the sensitivity index could be defined as

$$SI_{PQ} = [\ Q(P_o + \Delta P) - Q(P_o - \Delta P)\ ] / 2\ \Delta P \qquad (1)$$

Other sensitivity indices could be defined (McCuen 1973). Letting the index i represent a decrease and j represent an increase in the parameter value from its base value P_o, the sensitivity index SI_{PQ} for parameter P and output variable Q is could be defined as

$$SI_{PQ} = \{\ |\ (Q_o - Q_i) / (P_o - P_i)\ | + |\ (Q_o - Q_j) / (P_o - P_j)\ |\ \} / 2 \qquad (2)$$

or

$$SI_{PQ} = \max\ \{\ |\ (Q_o - Q_i) / (P_o - P_i)\ |,\ |\ (Q_o - Q_j) / (P_o - P_j)\ |\ \} \qquad (3)$$

A dimensionless expression of sensitivity is the elasticity index, EI_{PQ}, that measures the relative change in output Q for a relative change in input P could be defined as

$$EI_{PQ} = [P_o / Q(P_o)]\ SI_{PQ} \qquad (4)$$

4.2.2 A simple deterministic sensitivity analysis procedure

This deterministic sensitivity analysis approach is very similar those most often employed in the engineering economics literature. It is based on the idea of varying one uncertain parameter value, or set of parameter values, at a time. The ideas are applied to a water quality example to illustrate their use.

The output variable of interest can be any performance measure or indicator. Thus one does not know if more or less of a given variable is better or worse. Perhaps too much and/or too little is undesirable. The key idea is that, whether employing physical measures or economic metrics of performance, various parameters (or sets of associated parameters) are assigned high and low values. Such ranges may reflect either the differences between the minimum and maximum values for each parameter, the 5 and 95 percentiles of a parameters distribution, or points corresponding to some other criteria. The system model is then run with the various alternatives, one at a time, to evaluate the impact of those errors in various sets of parameter values on the output variable.

Table 1 illustrates the character of the results that one would obtain. Here Y_0 is the nominal value of the model output when all parameters assume the estimated best values, and $Y_{i,L}$ and $Y_{i,H}$ are the values obtained by increasing or decreasing the values of the ith set of parameters.

Table 1. Sensitivity of model output Y to possible errors in four parameter sets containing a single parameter or a group of parameters that vary together.

parameter set	low value	nominal	high value
	$Y_{1,L}$	Y_0	$Y_{1,H}$
	$Y_{2,L}$	Y_0	$Y_{2,H}$
	$Y_{3,L}$	Y_0	$Y_{3,H}$
	$Y_{4,L}$	Y_0	$Y_{4,H}$

A simple water quality example is employed to illustrate this deterministic approach to sensitivity analysis. The analysis techniques illustrated here are just as applicable to complex models. The primary difference is that more work would be required to evaluate the various alternatives with a more complex model, and the model responses might be more complicated.

The simple water quality model is provided by Vollenweider's empirical relationship for the average phosphorus concentration in lakes (Vollenweider, 1976). He found that the phosphorus concentration, P (mg/m^3), is a function of the annual phosphorus loading rate, L (mg/m^2•a), the annual hydraulic loading, q (m/a or more exactly m^3/m^2•a), and the mean water depth, z (m).

$$P = (L/q) / [\, 1 + (z/q)^{0.5} \,] \qquad (5)$$

L/q and P have the same units; the denominator is an empirical factor that compensates for nutrient recycling and elimination within the aquatic lake environment.

Data for Lake Ontario in North America would suggest that reasonable values of the parameters are $L = 680$ mg/m^3; $q = 10.6$ m/a; and $z = 84$ m, yielding $P = 16.8$ mg/m^3. Values of phosphorus concentrations less than 10 mg/m^3 are considered oligotrophic, whereas values greater than 20 mg/m^3 generally correspond to eutrophic conditions. Reasonable ranges reflecting possible errors in the three parameters yield the values in Table 2.

Table 2. Sensitivity of estimates of phosphorus concentration (mg/m^3) to model parameter values. The two right most values in each row correspond to the Low and High values of the parameter, respectively

	parameter value		phosphorus concentration	
	low	high	P_{low}	P_{high}
[illegible]	500	900	12.4	22.3
[illegible]	8	13.5	20.0	14.4
[illegible]	81	87	17.0	16.6

One may want to display these results so they can be readily visualized and understood. A tornado diagram (Eschenbach, 1992) would show the lower and upper values of P obtained from variation of each parameter, with the parameter with the widest limits displayed on top, and the parameter having smallest limits on the bottom. Tornado diagrams (Figure 12) are easy to construct and can include a large number of parameters without becoming crowded.

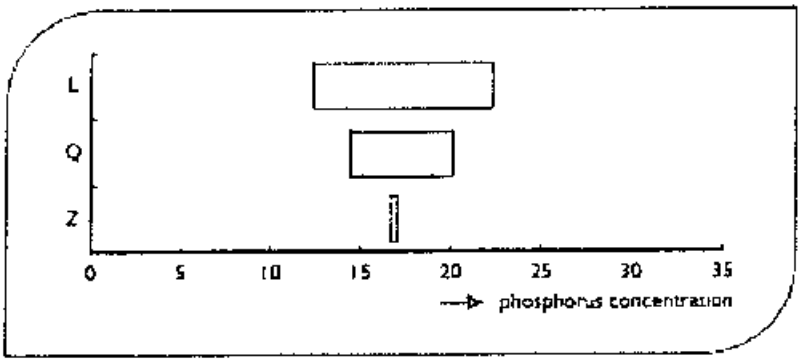

Figure 12. A Tornado diagram showing the range of the output variable representing phosphorus concentrations for high and low values of each of the parameter sets. Parameters are sorted so that the largest range is on top, and the smallest on the bottom.

An alternative to tornado diagrams is a Pareto chart showing the width of the uncertainty range associated with each variable, ordered from largest to smallest. A Pareto chart is illustrated in Figure 13.

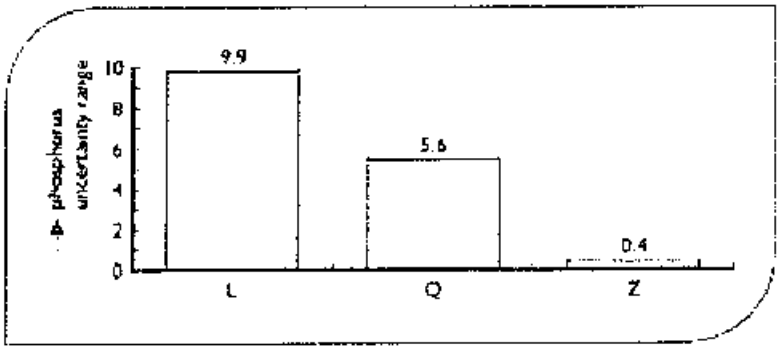

Figure 13. A Pareto Chart showing the range of the output variable representing phosphorus concentrations resulting from high and low values of each parameter set considered.

Another visual presentation is a spider plot showing the impact of uncertainty in each parameter on the variable in question, all on the same graph (Eschenback, 1992; DeGarmo, 1993, p. 401). A spider plot, Figure 14, shows the particular functional response of the output to each parameter on a common scale, so one needs a common metric to represent changes in all of the parameters. Here we use percentage change from the nominal or best values.

Spider plots are a little harder to construct than tornado diagrams, and can generally include only 4 - 5 variables without becoming crowded. However, they provide a more complete view of the relationships between each parameter and the performance measure. In particular, a spider plot reveals nonlinear relationships and the relative sensitivity of the performance measure to (percentage) changes in each variable.

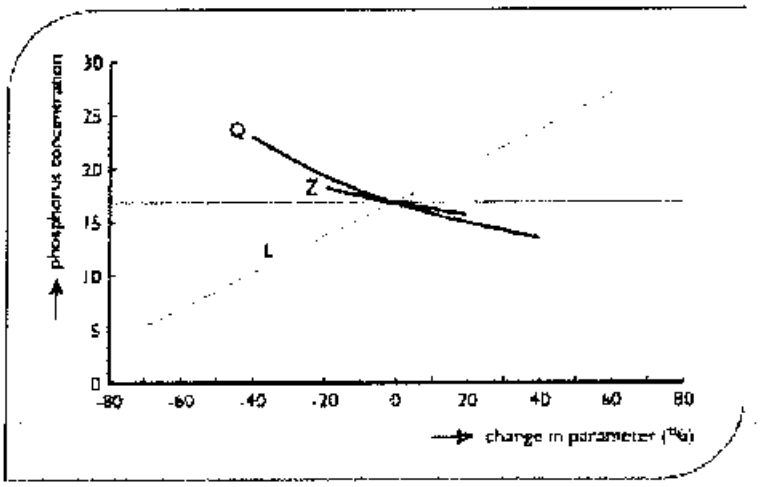

Figure 14. Spider Plot illustrates the relationships between model output describing phosphorus concentrations and variations in each of the parameter sets, expressed as a percentage deviation from their nominal values.

In the spider plot, the linear relationship between P and L and the gentle nonlinear relationship between P and q is illustrated. The range for z has been kept small given the limited uncertainty associated with that parameter.

4.2.3 Multiple errors and interactions

An important issue that should not be ignored is the impact of simultaneous errors in more than one parameter. Probabilistic methods directly address the occurrence of simultaneous errors, but the correct joint distribution needs to be employed. With simple sensitivity analysis procedures, errors in parameters are generally investigated one at a time, or in groups. The idea of considering pairs or sets of parameters is discussed here.

Groups of factors. It is often the case that reasonable error scenarios would have several parameters changing together. For this reason, the alternatives have been called parameter sets. For example, possible errors in water depth would be accompanied with corresponding variations in aquatic vegetation and chemical parameters. Likewise, alternatives related to changes in model structure might be accompanied with variations in several parameters. In other cases, there may be no causal relationship among possible errors (such as model structure

versus inflows at the boundary of the modeled region), but they might still interact to effect the precision of model predictions.

Combinations. If one or more non-grouped parameters interact in significant ways, then combinations of one or more errors should be investigated. However, one immediately runs into a combinatorial problem. If each of m parameters can have 3 values (high, nominal, and low) there are 3^m combinations, as opposed to 2m + 1 if each parameter is varied separately. [For m = 5, the differences are $3^5 = 243$ versus 2(5)+1 = 11.] These numbers can be reduced by considering instead only combinations of extremes so that only $2^m + 1$ cases need be considered [$2^5 + 1 = 33$], which is a more manageable number. However, all of the parameters would be at one extreme or the other, and such situations would be very unusual.

Two factors at a time. A compromise is to consider all pairs of two parameters at a time. There are m(m-1)/2 possible pairs of m parameters. Each parameter has a high and low value. Since there are 4 combinations of high and low values for each pair, there are a total of 2m(m-1) combinations. [For m = 5 there are 40 combinations of two parameters each having two values.]

The presentation of these results could be simplified by displaying for each case only the maximum error, which would result in m(m-1)/2 cases that might be displayed in a Pareto diagram. This would allow identification of those combinations of two parameters that might yield the largest errors and thus are of most concern.

For the water quality example, if one plots the absolute value of the error for all four combinations of high (+) and low (-) values for each pair of parameters, they obtain Figure 15.

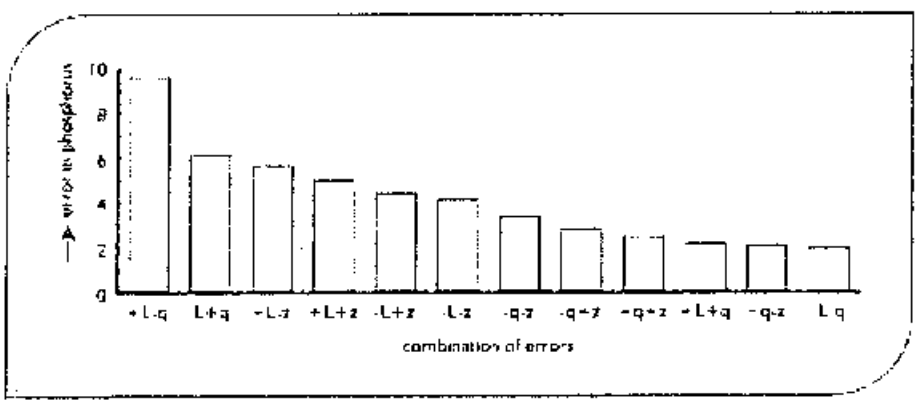

Figure 15. Pareto diagram showing errors in phosphorus concentrations for all combinations of pairs of input parameters errors. A + indicates a high value, and a - indicates a low value for indicated parameter. *L* is the phosphorus loading rate, *q* is the hydraulic loading, and *z* is the mean lake depth.

Considering only the worst error for each pair of variables yields Figure 16.

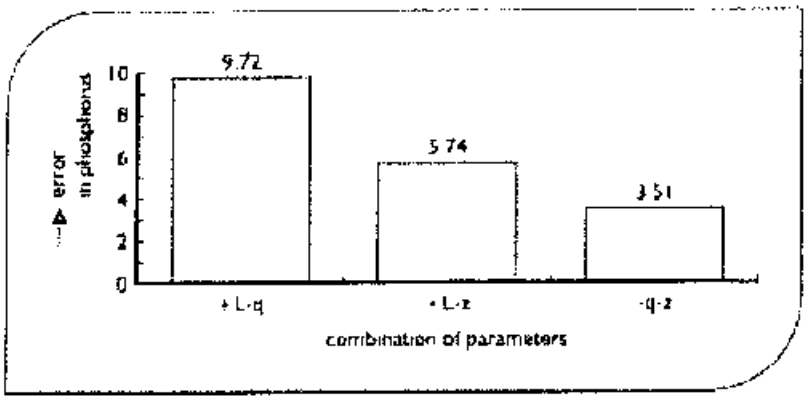

Figure 16. Pareto diagram showing worst error combinations for each pair of input parameters. A '+' indicates a high value, and a '–' indicates a low value for indicated parameter.

Here we see, as is no surprise, that the worst error results from the most unfavorable combination of L and q values. If both parameters have their most unfavorable values, the predicted phosphorus concentration would be 27 mg/m^3.

Looking for non-linearities. One might also display in a Pareto diagram the maximum error for each pair as a percentage of the sum of the absolute values of the maximum error from each parameter separately. The ratio of the joint error to the individual errors would illustrate potentially important nonlinear interactions. If the model of the system and the physical measure or economic metric were strictly linear, then the individual ratios should add to one.

4.2.4 First-order sensitivity analysis

The above deterministic analysis has trouble representing reasonable combinations of errors in several parameter sets. If the errors are independent, it is highly unlikely that any two sets would actually be at their extreme ranges at the same time. By defining probability distributions of the values of the various parameter sets, and specifying their joint distributions, a probabilistic error analysis can be conducted. In particular, for a given performance indicator, one can use multivariate linear analyses to evaluate the approximate impact on the performance indices of uncertainty in various parameters. As shown below, the impact depends upon the square of the sensitivity coefficients (partial derivatives) and the variances and covariances of the parameter sets.

For a performance indicator $I = F(Y)$, which is a function $F(\cdot)$ of model outputs Y, that are in turn a function $g(P)$ of input parameters P, one can use a multivariate Taylor series approximation of F to obtain the expected value and variance of the indicator:

$$E[I] = F(\text{ based on mean values of input parameters}) + (1/2)\ \{\Sigma_i\Sigma_j\ [\partial F^2/\partial P_i \partial P_j]\ \mathrm{Cov}\ [P_i, P_j]\ \} \quad (6)$$

and

$$\mathrm{Var}[I] = \Sigma_i\Sigma_j\ (\partial F/\partial P_i)(\partial F/\partial P_j)\ \mathrm{Cov}\ [P_i, P_j] \quad (7)$$

where $(\partial F/\partial P_i)$ are the partial derivative of the function F with respect to P_i evaluated at the mean value of the input parameters P_i, and $\partial F^2/\partial P_i \partial P_j$ are the second partial derivatives. The covariance of two random input parameters P_i and P_j is the expected value of the product of differences between the values and their means.

$$\mathrm{Cov}[P_i, P_j] = E[(P_i - E[P_i])(P_j - E[P_j])] \quad (8)$$

If all the parameters are independent of each other, and the second-order terms in the expression for the mean $E[I]$ are neglected, one obtains

$$E[I] = F(\text{ based on mean values of input parameters}) \quad (9)$$

and

$$\mathrm{Var}\ [I] = \Sigma_i\ [\partial F/\partial P_i]^2\ \mathrm{Var}\ [P_i] \quad (10)$$

(Benjamin and Cornell, 1970). Equation 6 for $E[I]$ shows that in the presence of substantial uncertainty, the mean of the output from nonlinear systems is not simply the system output corresponding to the mean of the parameters (Gaven and Burges, 1981, p. 1523). This is true for any nonlinear function.

Of interest in the analysis of uncertainty is the approximation for the variance $\mathrm{Var}[I]$ of indicator I. In Equation 10 the contribution of P_i to the variance of I equals $\mathrm{Var}[P_i]$ times $[\partial F/\partial P_i]^2$, which are the squares of the sensitivity coefficients for indicator I with respect to each input parameter value P_i.

4.2.4.1 An example of first-order sensitivity analysis

It may appear that first-order analysis is difficult because the partial derivatives of the performance indicator I are needed with respect to the various parameters. However, reasonable approximations of these sensitivity coefficients can be obtained from the simple sensitivity analysis described in Table 3, as shown below. In that table, three different parameter sets, P_i, are defined in which one parameter of the set is at its high value, P_{iH}, and one is at its low value, P_{iL}, to produce corresponding values (called high, I_{iH}, and low, I_{iL}) of a system performance indicator I.

Table 3. Approximate parameter sensitivity coefficients.

parameter set	value: low	value: high	sensitivity coefficient
[illegible]	I_{1L}	I_{1H}	$[I_{1H}-I_{1L}]/[P_{1H}-P_{1L}]$
[illegible]	I_{2L}	I_{2H}	$[I_{2H}-I_{2L}]/[P_{2H}-P_{2L}]$
[illegible]	I_{3L}	I_{3H}	$[I_{3H}-I_{3L}]/[P_{3H}-P_{3L}]$

It is then necessary to estimate some representation of the variances of the various parameters with some consistent procedure. For a normal distribution, the distance between the 5 and 95 percentiles is 1.645 standard deviations on each side of the mean, or 2(1.645) = 3.3 standard deviations. Thus, if the high/low range is thought of as approximately a 5-95 percentile range for a normally distributed variate, a reasonable approximation of the variance might be

$$\mathrm{Var}[P_i] = \{ [P_{iH}-P_{iL}]/3.3 \}^2. \qquad (11)$$

This is all that is needed. Use of these average sensitivity coefficients is very reasonable for modeling the behavior of the system performance indicator I over the indicated ranges.

As an illustration of the method of first-order uncertainty analysis, consider the lake quality problem described above. The "system performance indicator" in this case is the model output, the phosphorus concentration P, and the input parameters, now denoted as $X = L$, q, and z. The standard deviation of each parameter is assumed to be the specified range divided by 3.3. Average sensitivity coefficients $\partial P/\partial X$ were calculated. The results are reported in the table below.

Table 4. Calculation of approximate parameter sensitivity coefficients.

variable X	units	$\delta P/\delta X$	St Dev[X]	$[\delta P/\delta X]^2$ Var[X]	%
[illegible]	[illegible]	0.025	[illegible]	9.18	75.7
[illegible]	[illegible]	-1.024	1.67	2.92	24.1
[illegible]	[illegible]	-0.074	1.82	0.02	0.2

98

Assuming the parameter errors are independent:

$$\mathrm{Var}[P] = 9.18 + 2.92 + 0.02 = 12.12 \qquad (12)$$

The square root of 12.12 is the standard deviation and equals 3.48. This agrees well with a Monte Carlo analysis reported below.

Note that 100*(9.18/12.12), or about 76% of the total parameter error variance in the phosphorus concentration P is associated in the phosphorus loading rate L and the remaining 24% is associated with the hydrologic loading q. Eliminating the uncertainty in z would have a negligible impact on the overall model error. Likewise, reducing the error in q would at best have a modest impact on the total error.

Due to these uncertainties, the estimated phosphorus concentration has a standard deviation of 3.48. Assuming the errors are normally distributed, and recalling that ± 1.645 standard deviations around the mean define a 5-95 percentile interval, the 5-95 percentile interval would be about

$$16.8 \pm 1.645\ (3.48)\ \mathrm{mg/m^3} = 16.8 \pm 5.7\ \mathrm{mg/m^3} = 11.1 \text{ to } 22.5\ \mathrm{mg/m^3}. \qquad (13)$$

These error bars indicate there is substantial uncertainty associated with the phosphorus concentration P, primarily due to uncertainty in the loading rate L.

The upper bound of 22.6 $\mathrm{mg/m^3}$ is considerably less than the 27 $\mathrm{mg/m^3}$ that would be obtained if both L and q had their most unfavorable values. In a probabilistic analysis with independent errors, such a combination is highly unlikely.

4.2.4.2 Warning on accuracy.

First-order uncertainty analysis is indeed an approximate method based upon a linearization of the response function represented by the full simulation model. It may provide inaccurate estimates of the variance of the response variable for nonlinear systems with large uncertainty in the parameters. In such cases Monte Carlo simulation (discussed below and in Chapter VII) or the use of higher-order approximation may be required. Beck (1987, p. 1426) cites studies that found that Monte Carlo and first-order variances were not appreciably different, and a few studies that found specific differences. Differences are likely to arise when the distributions used for the parameters are bimodal (or otherwise unusual), or some rejection algorithm is used in the Monte Carlo analysis to exclude some parameter combinations. Such errors can result in a distortion in the ranking of predominant sources of uncertainty. However, in most cases very similar results were obtained.

4.2.5 Fractional factorial design method

An extension of first-order sensitivity analysis would be a more complete exploration of the response surface using a careful statistical design. First consider a complete factorial design. Input data are divided into discrete "levels'. The simplest case is two levels. These two levels can be defined as a nominal value, and a high (low) value. Simulation runs are made for all combinations of parameter levels. For n different inputs, this would require 2^n simulation runs. Hence for a three-input variable or parameter problem, 8 runs would be required. If 4 discrete levels of each input variable or parameter were allowed to provide a more reasonable description of a continuous variable, the three-input data problem would require 4^3 or 64 simulation runs. Clearly this is not a useful tool for large regional water resources simulation models.

A fractional factorial design involves simulating only a fraction of what is required from a full factorial design method. The loss of information prevents a complete analysis of the impacts of each input variable or parameter on the output.

To illustrate the fractional factorial design method, consider the two-level with three-input variable or parameter problem. Table 5 below shows the 8 simulations required for a full factorial design method. The '+' and the '–' show the upper and lower levels of each input variable or parameter P_i where $i = 1, 2, 3$. If all 8 simulations were performed, seven possible effects could be estimated. These are the individual effects of the three inputs P_1, P_2, and P_3, the three two-input variable or parameter interactions, $(P_1)(P_2)$, $(P_1)(P_3)$, and $(P_2)(P_3)$, and the one three-input variable or parameter interaction $(P_1)(P_2)(P_3)$.

Table 5. A three-input factorial design.

simulation run	value of input	P_1	P_2	P_3	value of output - variable Y
1		–	–	–	Y_1
2		+	–	–	Y_2
3		–	+	–	Y_3
4		+	+	–	Y_4
5		–	–	+	Y_5
6		+	–	+	Y_6
7		–	+	+	Y_7
8		+	+	+	Y_8

Consider an output variable Y, where Y_j is the value of Y in the jth simulation run. Then an estimate of the effect, denoted $\delta(Y|P_i)$, that input variable or parameter P_i has on the output variable Y, is the average of the four separate effects of varying P_i:

For i = 1:

$$\delta(Y \mid P_1) = 0.25\ [\ (Y_2-Y_1)+(Y_4-Y_3)+(Y_6-Y_5)+(Y_8-Y_7)\ ] \qquad (14)$$

Each difference in parentheses is the difference between a run in which P_1 is at its upper level and a run in which P_1 is at its lower level, but the other two parameter values, P_2 and P_3, are unchanged. If the effect is equal to 0, then, in this case, P_1 has no impact on the output variable Y.

Similarly the effects of P_2 and P_3, on variable Y can be estimated as:

$$\delta(Y \mid P_2) = 0.25\ \{\ (Y_3-Y_1)+(Y_4-Y_2)+(Y_7-Y_5)+(Y_8-Y_6)\ \} \qquad (15)$$

and

$$\delta(Y \mid P_3) = 0.25\ \{\ (Y_5-Y_1)+(Y_6-Y_2)+(Y_7-Y_3)+(Y_8-Y_4)\ \} \qquad (16)$$

Consider next the interaction effects between P_1 and P_2. This is estimated as the average of the difference between the average P_1 effect at the upper level of P_2, and the average P_1 effect at the lower level of P_2. This is the same as the difference between the average P_2 effect at the upper level of P_1 and the average P_2 effect at the lower level of P_1:

$$\delta(Y \mid P_1, P_2) = (1/2)\ \{\ [\ (Y_8-Y_7) + (Y_4-Y_3)]/2 - [\ (Y_2-Y_1) + (Y_6-Y_5)]/2\ \}$$

$$= (1/4)\ \{\ [\ (Y_8-Y_6)+(Y_4-Y_2)] - [\ (Y_3-Y_1) + (Y_7-Y_5)]\ \} \qquad (17)$$

Similar equations can be derived for looking at the interaction effects between P_1 and P_3, and between P_2 and P_3 and the interaction effects among all three inputs P_1, P_2, and P_3.

Now assume only half of the simulation runs were performed, perhaps runs 2, 3, 5 and 8 in this example. If only outputs Y_2, Y_3, Y_5, and Y_8 are available, for our example:

$$\delta(Y \mid P_3) = \delta(Y \mid P_1, P_2) = 0.5\ \{\ (Y_8 - Y_3) - (Y_2 - Y_5)\ \} \qquad (18)$$

The separate effects of P_3 and of P_1P_2 are not available from the output. This is the loss in information resulting from fractional instead of complete factorial design.

4.2.6 Monte Carlo sampling methods

The Monte Carlo method of performing sensitivity analyses, illustrated in Figure 16, first selects a random set of input data values drawn from their individual probability distributions. These values are then used in the simulation model to obtain some model output variable values. This process is repeated many times, each time making sure the model calibration is

valid for the input data values chosen. The end result is a probability distribution of model output variables and system performance indices that results from variations and possible errors in all of the input values.

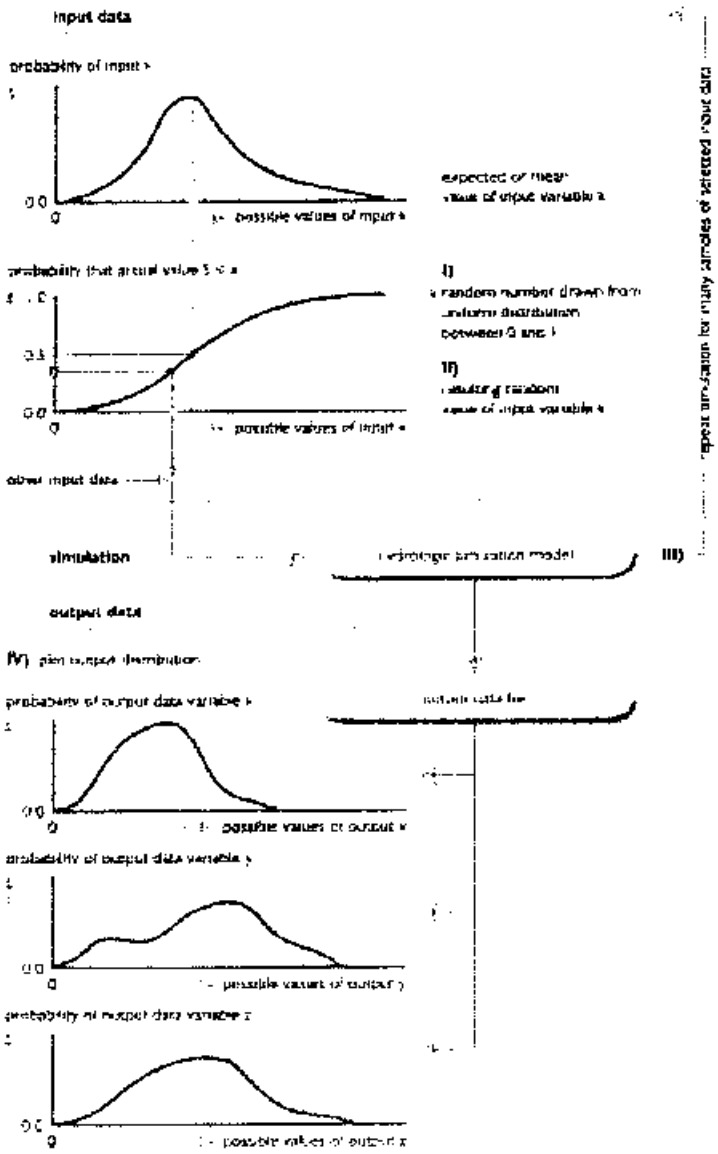

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Figure 16. Monte Carlo sampling and simulation procedure for finding distributions of output variable values based on distributions, for specified reliability levels, of input data values. This technique can be applied to one or more uncertain input variables at a time. The output distributions will reflect the combined effects of this input uncertainty over the specified ranges.

Using a simple Monte Carlo analysis, values of all of the parameter sets are selected randomly from distributions describing the individual and joint uncertainty in each, and then the modeled system is simulated to obtain estimates of the selected performance indices. This must be done many times (often well over 100) to obtain a statistical description of system performance variability. The number of replications needed is generally not dependent on the number of parameters whose errors are to be analyzed. One can include in the simulation the uncertainty in parameters as well as natural variability. This method can evaluate the impact of single or multiple uncertain parameters.

A significant problem that arises in such simulations is that some combinations of parameter values result in unreasonable models. For example, model performance with calibration data sets might be inconsistent with available data sets. The calibration process places interesting constraints on different sets of parameter values. Thus, such Monte Carlo experiments often contain checks that exclude combinations of parameter values that are unreasonable. In these cases the generated results are conditioned on this validity check.

Whenever sampling methods are used, one must consider possible correlations among input data values. Sampling methods can handle spatial and temporal correlations that may exist among input data values, but the existence of correlation requires defining appropriate conditional distributions.

One major limitation of applying Monte Carlo methods to estimate ranges of risk and uncertainty for model output variable values, and system performance indicator values based on these output variable values, is the computing time required. To reduce the computing times needed to perform sensitivity analyses using sampling methods, some tricks and as well as stratified sampling methods are available. The discussion below illustrates the idea of a simple modification (or trick) using a "standardized" Monte Carlo analysis. The more general Latin Hypercube Sampling procedure is also discussed.

4.2.6.1 Simple Monte Carlo sampling

To illustrate the use of Monte Carlo sampling methods consider again Vollenweider's empirical relationship, Equation 5, for the average phosphorus concentration in lakes (Vollenweider, 1976). Two hundred values of each parameter were generated independently from normal distributions with the means and variances as shown in Table 6.

The table contains the specified means and variances for the generated values of L, q and z, and also the actual values of the means and variances of the 200 generated values of L, q, z and also of the 200 corresponding generated output phosphorus concentrations, P. Figure 17 displays the distribution of the generated values of P.

Table 6. Monte Carlo analysis of lake phosphorus levels.

	specified means and standard deviations			
	680.00	10.60	84.00	—
	121.21	1.67	1.82	—
	generated means and standard deviations			
	674.18	10.41	84.04	17.07
	130.25	1.73	1.82	3.61

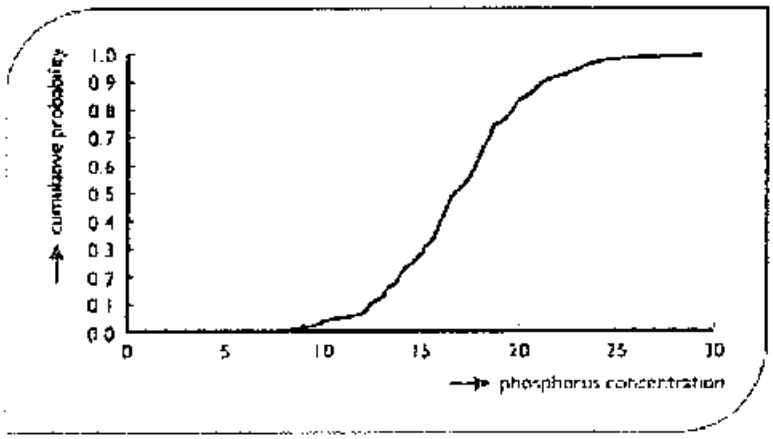

Figure 17. Distribution of lake phosphorus concentrations from Monte Carlo analysis

One can see that given the estimated levels of uncertainty, phosphorus levels could reasonably range from below 10 to above 25. The probability of generating a value greater than 20 mg/m^3 was 12.5%. The 5% to 95 percentile range was 11.1 to 23.4 mg/m^3. In the figure, the cumulative probability curve is rough because only 200 values of the phosphorus concentration were generated, but these are clearly enough to give a good impression of the overall impact of the errors.

4.2.6.2 Sampling uncertainty.

In this example, the mean of the 200 generated values of the phosphorus concentration, P, was 17.07. However a different set of random values would have generated a different set of P values as well. Thus it is appropriate to estimate the standard error, SE, of this average. The standard error equals the standard deviation of the P values divided by the square root of the sample size n:

$$SE = \sigma/(n)^{0.5} = 3.61/(200)^{0.5} = 0.25. \qquad (19)$$

From the central limit theorem of mathematical statistics, the average of a large number of independent values should have very nearly a normal distribution. Thus, 95% of the time, the true mean of P should be in the interval 17.1 ± 1.96 (0.25), or 16.6 to 17.6 mg/m^3. This level of uncertainty reflects the observed variability of P and the fact that only 200 values were generated.

4.2.6.3 Making sense of the results.

A significant challenge with complex models is to determine from the Monte Carlo simulation which parameter errors are important. Calculating the correlation between each generated input parameter value and the output variable value is one way of doing this. As Table 7 below shows, based upon the magnitudes of the correlation coefficients, errors in L were most important, and those in q second in importance.

Table 7. Correlation analysis of Monte Carlo results.

1			
0.079	1		
0.1297	-0.139	1	
0.851	-0.434	0.144	1

One can also use regression to develop a linear model defining variations in the output based on errors in the various parameters. The results are shown in the Table 8. The fit is very good, and R^2 = 98%. If the model for *P* had been linear, a R^2 value of 100% should have resulted. All of the coefficients are significantly different from zero.

Note that the correlation between *P* and *z* was positive in Table 7, but the regression coefficient for *z* is negative. This occurred because there is a modest negative correlation between the generated *z* and *q* values. Use of partial correlation coefficients can also correct for such spurious correlations among input parameters.

Table 8. Results of Regression Analysis on Monte Carlo Results

18.605	1.790	10.39
0.025	0.000	85.36
-1.068	0.022	-48.54
-0.085	0.021	-4.08

Finally we display a plot, Figure 18, based on this regression model illustrating the reduction in the variance of *P* that is due to dropping each variable individually. Clearly *L* has the biggest impact on the uncertainty in *P*, and *z* the least.

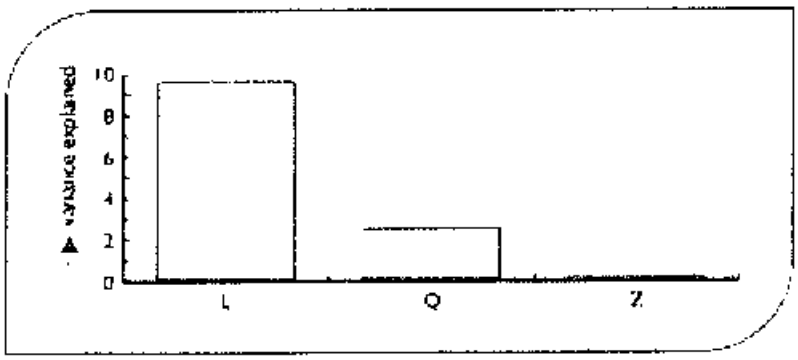

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Figure 18. Reduction in the variance of P that is due to dropping from the regression model each variable individually. Clearly L has the biggest impact on the uncertainty in P, and z the least.

4.2.6.4 Standardized Monte Carlo analysis

Using a "standardized" Monte Carlo analysis, one could adjust the generated values of L, q and z above so that the generated samples actually have the desired mean and variance. While making that correction, one can also shuffle their values so that the correlations among the generated values for the different parameters are near zero, as is desired. This was done for the 200 generated values to obtain the statistics shown in Table 9.

Table 9. Standardized Monte Carlo analysis of lake phosphorus levels

specified means and standard deviations			
480.00	10.60	84.00	—
121.21	1.67	1.82	—
generated means and standard deviations			
480.00	10.60	84.00	17.03
121.21	1.67	1.82	2.44

Repeating the correlation analysis from before (shown in Table 10) now yields much clearer results that are in agreement with the regression analysis. The correlation between P and both q and z are now negative as they should be. Because the generated values of the three parameters have been adjusted to be uncorrelated, the signal from one is not confused with the signal from another.

Table 10. Correlation analysis of standardized Monte Carlo results

1.00			
0.01	1.00		
0.02	0.00	1.00	
0.85	-0.50	-0.02	1.00

The mean phosphorus concentration changed very little. It is now 17.0 instead of 17.1 mg/m^3.

Using control variates with a linear predictive model in conjunction with the standardized Monte Carlo variates, the standard deviation of the errors associated with the 200 observations is only 0.45. Thus the standard error for this estimate of the mean of P is $0.45/(200)^{0.5}$ or just 0.03. Thus this is a highly accurate result. The regressions were also repeated and yielded very similar results. The only real difference was that the parameter estimates had small standard errors and were more significant because of the elimination of correlation between the generated parameters.

4.2.6.5 Generalized likelihood estimation

Beven (1993) and Binley and Beven (1991) suggest a Generalized Likelihood Uncertainty Estimation (GLUE) technique for assessment of parameter error uncertainty using Monte Carlo simulation. It is described as a "formal methodology for some of the subjective elements of model calibration" (Beven, 1989, p. 47). The basic idea is to begin by assigning reasonable ranges for the various parameters and then to draw parameter sets from those ranges using a uniform or some similar (and flat) distribution. These generated parameter sets are then used on a calibration data set so that unreasonable combinations can be rejected, while reasonable values are assigned a posterior probability based upon a likelihood measure which may reflect several dimensions and characteristics of model performance.

Let $L(P_i) > 0$ be the value of the likelihood measure assigned to the ith parameter set's calibration sequence. Then the model predictions generated with parameter set/combination P_i are assigned posterior probability, $p(P_i)$.

$$p(P_i) = L(P_i)/\Sigma_j L(P_j) \qquad (20)$$

These probabilities reflect the form of Bayes theorem, which is well supported by probability theory (Devore, 1991). This procedure should capture reasonably well the dependence or correlation among parameters, because *reasonable* sequences will all be assigned larger probabilities, whereas sequences that are unable to reproduce the system response over the calibration period will be rejected or assigned small probabilities.

However, in a rigorous probabilistic framework, the L would be the likelihood function for the calibration series for particular error distributions. (This could be checked with available goodness-of-fit procedures; for example, Kuczera, 1988.) When relatively ad hoc measures are adopted for the likelihood measure with little statistical validity, the $p(P_i)$ probabilities are best described as pseudo probabilities or "likelihood" weights.

Another concern with this method is the potential efficiency. If the parameter ranges are too wide, a large number of unreasonable or very unlikely parameter combinations will be generated. These will either be rejected or else will have small probabilities and thus little effect on the analysis. In this case the associated processing would be a waste of effort. A compromise is to use some data to calibrate the model and to generate a prior or initial distribution for the parameters that is at least centered in the best range (Beven 1993, p. 48). Then use of a different calibration period to generate the $p(P_i)$ allows an updating of those initial probabilities to reflect the information provided by the additional calibration period with the adopted likelihood measures.

After the accepted sequences are used to generate sets of predictions, the likelihood weights would be used in the calculation of means, variances and quantiles, rather than the customary procedure of giving all the generated realizations equal weight. The resulting conditional distribution of system output reflects the initial probability distributions assigned to parameters, the rejection criteria, and the likelihood measure adopted to assign "likelihood" weights.

4.2.7 Latin hypercube sampling

For the simple Monte Carlo simulations described above, with independent errors, a probability distribution is assumed for each input parameter or variable. In each simulation run, values of all input data are obtained from sampling those individual and independent distributions. The value generated for an input parameter or variable is usually independent of what that value was in any previous run, or what other input parameter or variable values are in the same run. This simple sampling approach can result in a clustering of parameter values and hence both redundancy of information from repeated sampling in the same regions of a distribution and lack of information from no sampling in other regions of the distributions.

A stratified sampling approach ensures more even coverage of the range of input parameter or variable values with the same number of simulation runs. This can be accomplished by dividing the input parameter or variable space into sections and sampling from each section with the appropriate probability.

One such approach, Latin hypercube sampling (LHS), divides each input distribution into sections of equal probability for the specified the probability distribution, and draws one observation randomly from each range. Hence the ranges of input values within each section actually occur with equal frequency in the experiment. These values from each interval for each distribution are randomly assigned to those from other intervals to construct sets of input values for the simulation analysis. Figure 19 shows the steps in constructing a LHS for six simulations involving three inputs P_j (P_1, P_2, and P_3) and six intervals of their respective normal, uniform and triangular probability distributions.

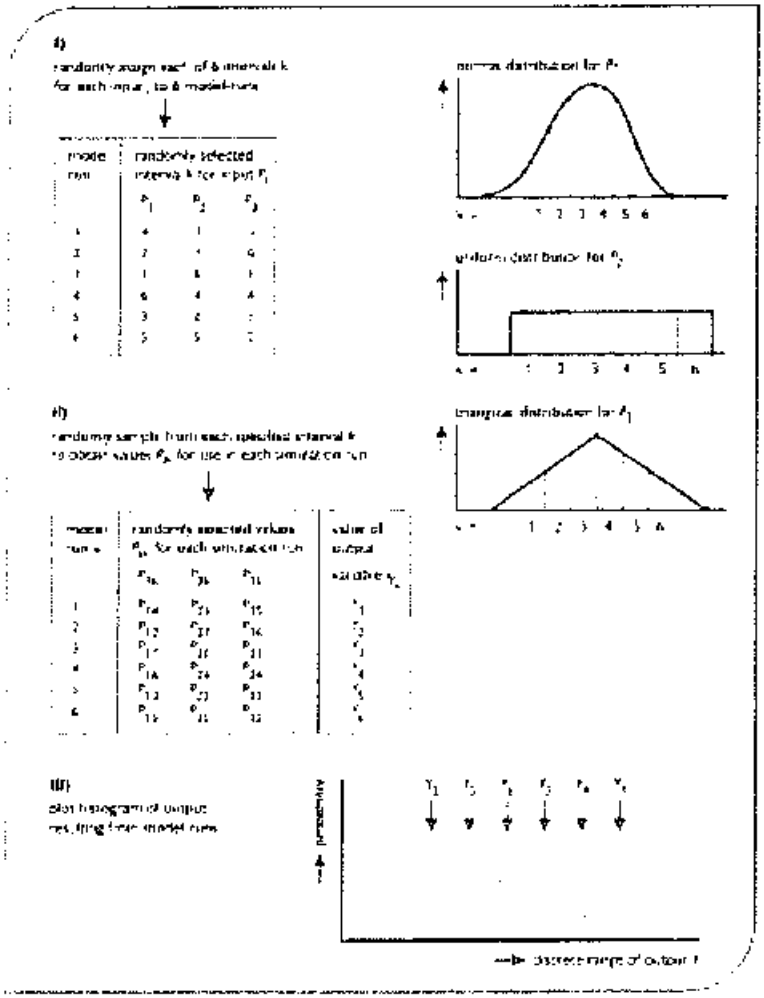

Figure 19. Schematic representation of a Latin hypercube sampling procedure for six simulation runs.

5. Performance indicator uncertainties

5.1 Performance measure target uncertainty

Another possible source of uncertainty is the selection of performance measure target values. For example, consider a target value for a pollutant concentration based on the effect of exceeding it in an ecosystem. Which target value is best or correct? When this is not clear, there are various ways of expressing the uncertainty associated with any target value. One such method is the use of fuzzy sets (Chapter VI). Use of 'grey' numbers or intervals instead of 'white' or fixed target values is another. When some uncertainty or disagreement exists over the selection of the best target value for a particular performance measure it seems to us the most direct and transparent way to do this is to subjectively assume a distribution over a range of possible target values. Then this subjective probability distribution can be factored into the tradeoff analysis, as outlined in Figure 20.

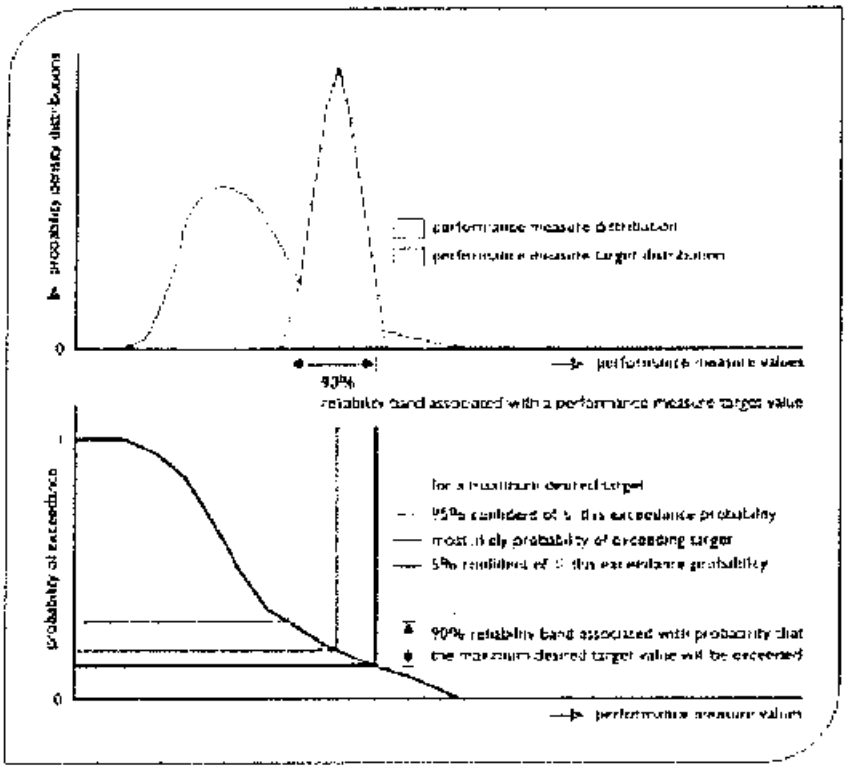

Figure 20. Combining the probability distribution of performance measure values with the probability distribution of performance measure target values to estimate the confidence one has in the probability of exceeding a maximum desired target value.

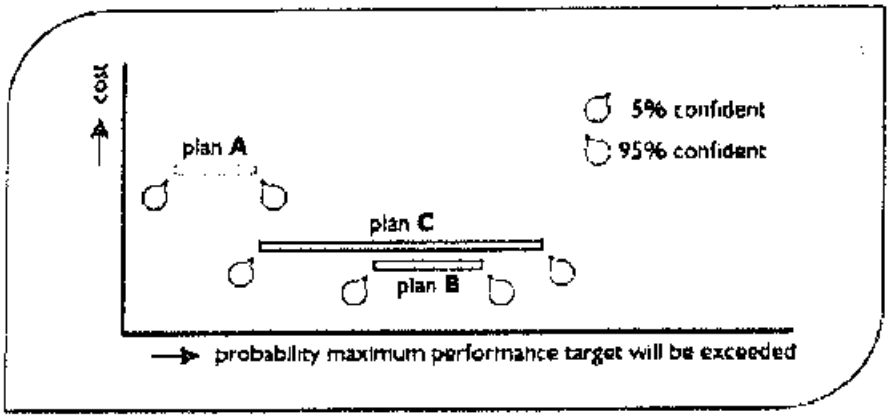

Figure 23. Tradeoffs among cost, reliabilities, and the confidence level of those reliabilities. The relative ranking of plans with respect to the probability of exceeding the desired (maximum limit) target may depend on the confidence given to that probability.

In Figure 23, in terms of cost the plans are ranked, from best to worst, B, C, and A. In terms of reliability at the 90 percent confidence level, they are ranked A, B, and C but at the 50 percent confidence level the ranking is A, C and B.

If the plan evaluation process has difficulty handling all this it may indicate the need to focus the uncertainty analysis effort on just what is deemed important, achievable, and beneficial. Then when the number of alternatives has been narrowed down to only a few that appear to be the better ones, a more complete uncertainty analysis can be performed. There is no need nor benefit in performing sensitivity and uncertainty analyses on all possible management alternatives. Rather one can focus on those alternatives that look the most promising, and then carry out additional uncertainty and sensitivity analyses only when important uncertain performance indicator values demands more scrutiny. Otherwise the work is not likely to affect the decision anyway.

5.2 Distinguishing differences between performance indicator distributions

Simulations of alternative water management infrastructure designs and operating policies require a comparison of the simulation outputs – the performance measures or indicators – associated with each alternative. A reasonable question to ask is are the observed differences statistically significant. Can one really tell if one alternative is better than another or are the observed differences explainable by random variations attributable to variations in the inputs and how the system responds?

This is a common statistical issue that is addressed by standard hypothesis tests (Devore, 1991; Benjamin and Cornell, 1970). Selection of an appropriate test requires that one first resolve what type of change one expects in the variables. To illustrate, consider the comparison of two

One of the challenges associated with defining and including in an analysis the uncertainty associated with a target or threshold value for a performance measure is that of communicating just what the result of such an analysis means. Referring to Figure 20, suppose the target value represents some maximum limit of a pollutant, say phosphorus, concentration in the flow during a given period of time at a given site or region, and it is not certain just what that maximum limit should be. Subjectively defining the distribution of that maximum limit, and considering that uncertainty along with the uncertainty (probability of exceedance function) of pollutant concentrations – the performance measure – one can attach a confidence to any probability of exceeding the maximum desired concentration value.

The 95% probability of exceedance shown on Figure 20, say $P_{0.95}$, should be interpreted as "we can be 95% confident that the probability of the maximum desired pollutant concentration being exceeded will be no greater than $P_{0.95}$." We can be only 5% confident that the probability of exceeding the desired maximum concentration will be no greater than the lower $P_{0.05}$ value. Depending on whether the middle line through the subjective distribution of target values in Figure 20 represents the most likely or median target value, the associated probability of exceedance is either the most likely, as indicated in Figure 20, or that for which we are only 50% confident.

Figure 21 attempts to show how to interpret the reliabilities when the uncertain performance targets are

- minimum acceptable levels that are to be maximized,
- maximum acceptable levels that are to be minimized or
- optimum levels.

An example of a minimum acceptable target level might be the population of wading birds in an area. An example of a maximum acceptable target level might be, again, the phosphorus concentration of the flow in a specific wetland or lake. An example of an optimum target level might be the depth of water most suitable for selected species of aquatic vegetation during a particular period of the year.

For performance measure targets that are not expressed as minimum or maximum limits but that are the 'best' values, referring to Figure 21, one can state that one is 90% confident that the probability of achieving the desired target is no more than B. The 90% confidence level probability of not achieving the desired target is at least A+C. The probability of the performance measure being too low is at least A and the probability of the performance measure being too high is at least C, again at the 90% confidence levels. As the confidence level decreases the bandwidth decreases, and the probability of not meeting the target increases.

Now, clearly there is uncertainty associated with each of these uncertainty estimations, and this raises the question of how valuable is the quantification of the uncertainty of each additional component of the plan in an evaluation process. Will plan evaluators and decision makers

benefit from this additional information, and just how much additional uncertainty information is useful?

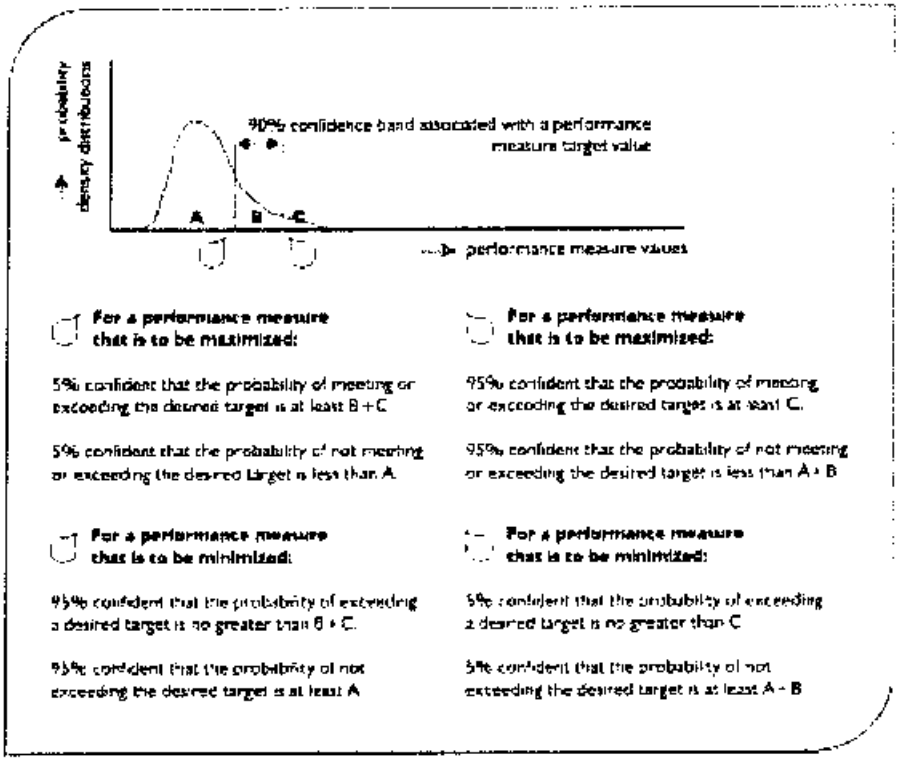

Figure 21. Interpreting the results of combining performance measure probabilities with performance measure target probabilities depends on the type of performance measure. The letters A, B, and C represent proportions of the probability density function of performance measure values. (Hence probabilities A + B + C = 1.)

Now consider again the tradeoffs that need to be made as illustrated in Figure 7. Instead of considering a single target value as shown on Figure 7, assume there is a 90% confidence range associated with that single performance measure target value. Also assume that the target is a maximum desired upper limit (e.g., of some pollutant concentration).

positive (say Y_1 tends to be larger then Y_2), or negative (Y_1 tends to be smaller), or are positive and negative differences are equally likely (there is no difference between Y_1 and Y_2).

Both parametric and non-parametric families of statistical tests are available for paired data. The common parametric test for paired data (a one-sample t test) assumes that the mean of the differences

$$X(i) = Y_1(i) - Y_2(i) \tag{21}$$

are normally distributed. Then the hypothesis of no difference is rejected if the t statistic is sufficiently large, given the sample size n.

Alternatively, one can employ a nonparametric test and avoid the assumption that the differences $X(i)$ are normally distributed. In such a case, one can use the Wilcoxon Signed Rank test. This nonparametric test ranks the absolute values $|X(i)|$ of the differences. If the sum S of the ranks of the positive differences deviates sufficiently from its expected value, $n(n+1)/4$ (were there no difference between the two distributions), one can conclude that there is a statistically significant difference between the $Y_1(i)$ and $Y_2(i)$ series. Standard statistical texts have tables of the distribution of the sum S as a function of the sample size n, and provide a good analytical approximation for $n > 20$ (for example, Devore, 1991). Both the parametric t test and the nonparametric Wilcoxon Signed Rank test require that the differences between the simulated values for each year be computed.

6. Communicating model output uncertainty

Spending money on reducing uncertainty would seem preferable to spending it on ways of calculating and describing it better. Yet attention to uncertainty communication is critically important if uncertainty analyses and characterizations are to be of value in a decision making process. In spite considerable efforts by those involved in risk assessment and management, we know very little about how to ensure effective risk communication to gain the confidence of stakeholders, incorporate their views and knowledge, and influence favorably the acceptability of risk assessments and risk-management decisions.

The best way to communicate concepts of uncertainty may well depend on what the audiences already know about risk and the various types of probability distributions (e.g., density, cumulative, exceedance) based on objective and subjective data, and the distinction between mean or average values and the most likely values. Undoubtedly graphical representations of these ways of describing uncertainty considerably facilitate communication.

The National Research Council (NRC 1994) addressed the extensive uncertainty and variability associated with estimating risk and concluded that risk characterizations should not be reduced to a single number or even to a range of numbers intended to portray uncertainty. Instead, the report recommended managers and the interested public should be given risk characterizations that are both qualitative and quantitative and both verbal and mathematical.

different operating policies. Let Y_1 denote the set of output performance variable values with the first policy, and Y_2 the set of output performance variable values of the second policy. In many cases, one would expect one policy to be better than the other. One measure might be the difference in the mean of the variables; for example is $E[Y_1] < E[Y_2]$?. Alternatively one could check the difference in the median (50 percentile) of the two distributions.

In addition, one could look for a change in the variability or variance, or a shift in both the mean and the variance. Changes described by a difference in the mean or median often make the most sense and many statistical tests are available that are sensitive to such changes. For such investigations parametric and non-parametric tests for paired and unpaired data can be employed.

Consider the differences between "paired" and "unpaired" data. Suppose that the meteorological data for 1941-1990 is used to drive a simulation model generating data as described in Table 11:

Table 11. Possible flow data from a 50-year simulation

Y_1 (1)	Y_2 (1)
Y_1 (2)	Y_2 (2)
Y_1 (3)	Y_2 (3)
Y_1 (4)	Y_2 (4)
Y_1 (49)	Y_2 (49)
Y_1 (50)	Y_2 (50)

Here there is one sample, $Y_1(1)$ through $Y_1(50)$, for policy 1, and another sample, $Y_2(1)$ through $Y_2(50)$, for policy 2. However, the two sets of observations are not independent. For example, if 1943 was a very dry year, then we would expect both $Y_1(3)$ for policy 1 in that year and $Y_2(3)$ for policy 2 to be unusually small. With such paired data, one can use a paired hypothesis test to check for differences. Paired tests are usually easier than the corresponding unpaired tests that are appropriate in other cases. (For example, if one were checking for a difference in average rainfall depth between 1941-1960, and 1961-1990, they would have two sets of independent measurements for the two periods. With such data, one should use a two-sample unpaired test.)

Paired tests are generally based on the differences between the two sets of output, $Y_1(i) - Y_2(i)$. These are viewed as a single independent sample. The question is then are the differences

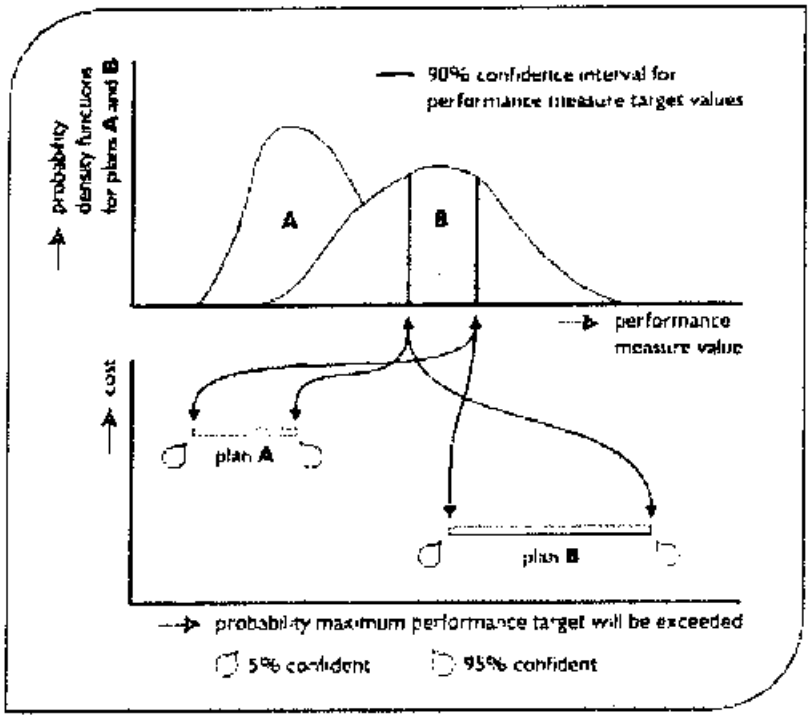

Figure 22. Two plans showing ranges of probabilities, depending on one's confidence, that an uncertain desired maximum (upper limit) performance target value will be exceeded. The 95% confidence levels are associated with the higher probabilities of exceeding the desired maximum target. The 5% confident levels are associated with the more desirable lower probabilities of exceeding the desired maximum target. Plan A with reduced probabilities of exceeding the upper limit costs more than Plan B.

In the case shown in Figure 22, the tradeoff is clearly between cost and reliability. In this example, no matter what confidence one chooses, Plan A is preferred to Plan B with respect to reliability, but Plan B is preferred to Plan A with respect to cost. The tradeoff is only between these two performance indicators or measures.

Consider however a third plan, as shown in Figure 23. This situation adds to the complexity of making appropriate tradeoffs. Now there are three criteria: cost, probability of exceedance (reliability) and the confidence in those reliabilities or probabilities. Add to this the fact that there will be multiple performance measure targets, each expressed in terms of their maximum probabilities of exceedance and the confidence in those probabilities.

In some cases communicating qualitative information about uncertainty to stakeholders and the public in general may be more effective than quantitative information. There are, of course, situations in which quantitative uncertainty analyses are likely to provide information that is useful in a decision-making process. How else can tradeoffs such as illustrated in Figures 10 and 27 be identified? Quantitative uncertainty analysis often can be used as the basis of qualitative information about uncertainty, even if the quantitative information is not what is communicated to the public.

One should acknowledge to the public the widespread confusion regarding the differences between variability and uncertainty. Variability does not change through further measurement or study, although better sampling can improve our knowledge about variability. Uncertainty reflects gaps in information about scientifically observable phenomena.

While it is important to communicate uncertainties and confidence in predictions, it is equally important to clarify who or what is at risk, possible consequences, and the severity and irreversibility of an adverse effect should a target value, for example, not be met. This qualitative information is often critical to informed decision-making. Risk and uncertainty communication is always complicated by the reliability and amounts of available relevant information as well as how that information is presented. Effective communication between people receiving information about who or what is at risk, or what might happen and just how severe and irreversible an adverse effect might be should a target value not be met, is just as important as the level of uncertainty and the confidence associated with such predictions. A two-way dialog between those receiving such information and those giving it can help identify just what seems best for a particular audience.

Risk and uncertainty communication is a two-way street, It involves learning and teaching. Communicators dealing with uncertainty should learn about the concerns and values of their audience, their relevant knowledge, and their experience with uncertainty issues. Stakeholders' knowledge of the sources and reasons for uncertainty needs to be incorporated into assessment and management and communication decisions. By listening, communicators can craft risk messages that better reflect the perspectives, technical knowledge, and concerns of the audience.

Effective communication should begin before important decisions have been made. It can be facilitated in communities by citizen advisory panels. Citizen advisory panels can give planners and decision makers a better understanding of the questions and concerns of the community and an opportunity to test its effectiveness in communicating concepts and specific issues regarding uncertainty.

One approach to make uncertainty more meaningful is to make risk comparisons. For example, a ten parts per billion target for a particular pollutant concentration is equivalent to 10 seconds in over 31 years. If this is an average daily concentration target that is to be satisfied "99 percent," of the time, this is equivalent to an expected violation of less than one day every three months.

Many perceive the reduction of risk by an order of magnitude as though it were a linear reduction. A better way to illustrate orders of magnitude of risk reduction is shown in Figure 24, in which a bar graph depicts better than words that a reduction in risk from one in a 1,000 (10^{-3}) to one in 10,000 (10^{-4}) is a reduction of 90% and that a further reduction to one in 100,000 (10^{-5}) is a reduction 10-fold less than the first reduction of 90%. The percent of the risk that is reduced by whatever measures is a much easier concept to communicate than reductions expressed in terms of estimated absolute risk levels, such as 10^{-5}.

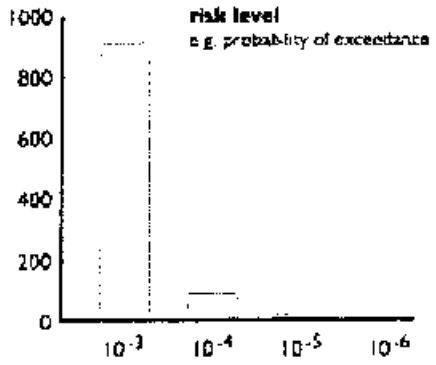

Figure 24. Reducing risk by orders of magnitude is not equivalent to linear reductions.

Risk comparisons can be helpful, but they should be used cautiously and tested if possible. There are dangers in comparing risks of diverse character, especially when the intent of the comparison is seen as minimizing a risk (NRC 1989). One difficulty in using risk comparisons is that it is not always easy to find risks that are sufficiently similar to make a comparison meaningful. How is someone able to compare two alternatives having two different costs and two different risk levels, for example, as is shown in Figure 7? One way is to perform an indifference analysis (Chapter X), but that can lead to different results depending who performs it. Another way is to develop utility functions using weights, where, for example reduced phosphorus load by half is equivalent to a 25 percent shorter hydroperiod in that area, but again each person's utility or tradeoff may differ.

At a minimum, graphical displays of uncertainty can be helpful. Consider the common system performance indicators that include:

- Time-series plots for continuous time-dependent indicators (Figure 25 upper left)
- Probability exceedance distributions for continuous indicators (Figure 25 upper right),
- Histograms for discrete event indicators (Figure 25 lower left), and
- Overlays on maps for space-dependent discrete events (Figure 25 lower right).

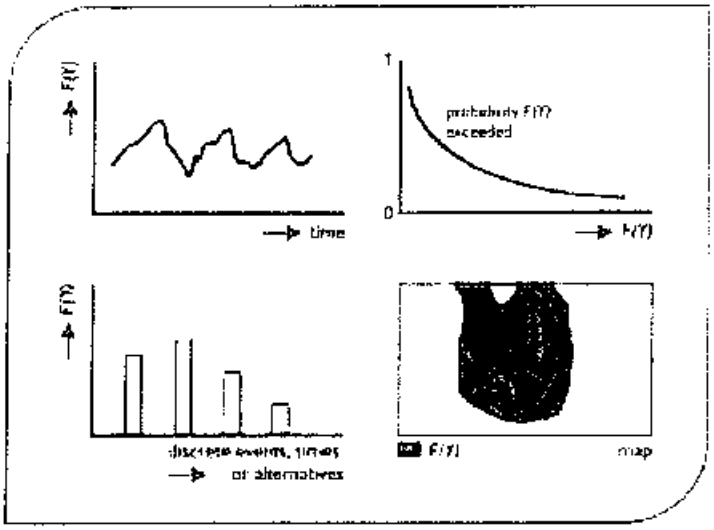

Figure 25. Different types of displays used to show model output Y or system performance indicator values $F(Y)$.

The first three graphs in Figure 25 could show, in addition to the single curve or bar that represents the most likely output, a range of outcomes associated with a given confidence interval. For overlays of information on maps, different colors could represent the spatial extents of events associated with different ranges of risk or uncertainty. Figure 26, corresponding to Figure 25, illustrates these approaches for displaying these ranges.

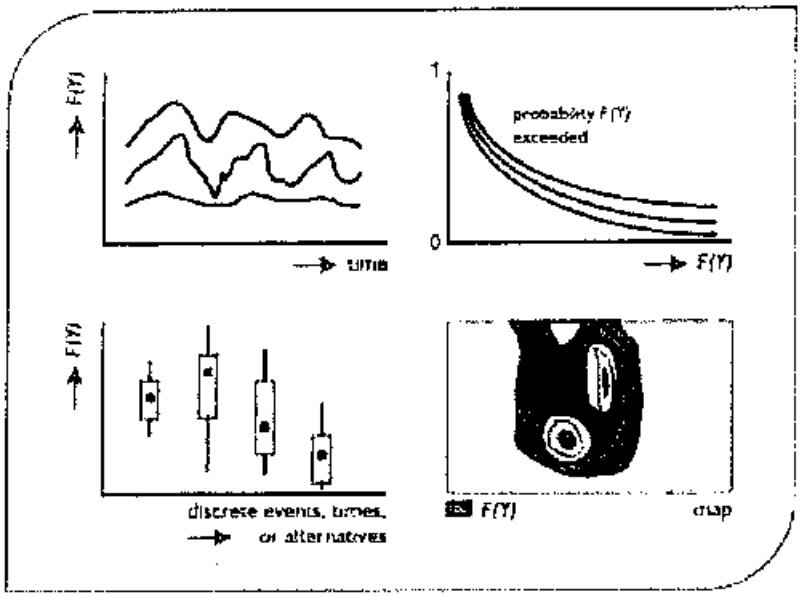

Figure 26. Plots of ranges of possible model output Y or system indicator values $F(Y)$ for different types of displays.

7. Conclusions

This chapter provides an overview of uncertainty and sensitivity analyses in the context of hydrologic or water resources systems simulation modeling. A broad range of tools are available to explore, display, and quantify the sensitivity and uncertainty in predictions of key output variables and system performance indices with respect to imprecise and random model inputs and to assumptions concerning model structure. They range from relatively simple deterministic sensitivity analysis methods to more involved first-order analyses and Monte Carlo sampling methods.

Because of the complexity of many watersheds or river basins, Monte Carlo methods for uncertainty analyses may be a very major and unattractive undertaking. Therefore it is often prudent begin with the relatively simple deterministic procedures. This coupled with a probabilistically based first-order uncertainty analysis method can help quantify the uncertainty in key output variables and system performance indices, and the relative contributions of uncertainty in different input variables to the uncertainty in different output variables and system performance indices. These relative contributions may differ depending upon which output variables and indices are of interest.

A sensitivity analysis can provide a systematic assessment of the impact of parameter value imprecision on output variable values and performance indices, and of the relative contribution of errors in different parameter values to that output uncertainty. Once the key variables are identified, it should be possible to determine the extent to which parameter value uncertainty can be reduced through field investigations, development of better models, and other efforts.

Model calibration procedures can be applied to individual catchments and subsystems, as well as to composite systems. Automated calibration procedures have several advantages including the explicit use of an appropriate statistical objective function, identification of those parameters that best reproduce the calibration data set with the given objective function, and the estimations of the statistical precision of the estimated parameters.

All of these tasks together can represent a formidable effort. However, knowledge of the uncertainty associated with model predictions can be as important to management decision and policy formulation as are the predictions themselves.

No matter how much attention is given to quantifying and reducing uncertainties in model outputs, uncertainties will remain. Professionals who analyze risk, managers and decision makers who must manage risk, and the public who must live with risk and uncertainty, have different information needs and attitudes regarding risk and uncertainty. It is clear that information needs differ among those who model or use models, those who make substantial investment or social decisions, and those who are likely to be impacted by those decisions. Meeting those needs should result in more informed decision making. But it comes at a cost that should be considered along with the benefits of having this sensitivity and uncertainty information.

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Appendix I: Model Calibration Examples

- *Calibration of models in the Murray-Darling Basin*

In the Murray-Darling Basin, in order to preserve water quality, water reliability and the environment, a decision was made in 1995 to restrict water use to the 1993/94 level of development. Computer models of the major tributary streams are now used at the end of each year to determine the annual use target for the previous season based on that level of development. Rules are in place to ensure that long term usage is maintained at the agreed level. Because the models now define the overall water rights of each valley, there are legal requirements to calibrate models and each model is independently audited and certified as being unbiased before being approved as fit for purpose. The key model output of interest is water use but emphasis is also placed on the modeling of downstream flow which impacts the rights of downstream regions. Each model must be calibrated over at least ten years and this often means that changes in infrastructure, operating rules and growth in demand have to be incorporated into the calibration run. Calibration reports contain plots of modeled and observed water use, storage behavior and flow and statistics such as mean error, correlation coefficients and standard errors. The aim of calibration is to ensure that the model is unbiased and to give confidence to stakeholders.

An issue that is sometimes raised with model development is the role of calibration, where the model is fine-tuned to match the observed data, and validation where the model is tested against data that was not used in the calibration process to get an independent assessment of the model's accuracy. For the Murray River, because of the variability of our climate, we like to calibrate our model against a long period of data including the most recent years when the current operating rules were being used and the historical data is generally the most reliable. Validation is considered to be less important and is typically carried out using the two or three years of data available following the completion of model calibration.

- *Use of models for Allocating Water in Texas*

Recent legislation in Texas revised the State Water Planning process and mandated the development of water allocation models for every river basin in the state (http://www.tnrcc.state.tx.us/permitting/waterperm/wrpa/permits.html). Similar to the Murray – Darling situation, these models are used to provide estimates of reliability for all permitted water diversions in the state as well as analysis of the effects of all permit applications. Naturalized, or predevelopment, time series of flows were constructed for the basins, and then the effects of developments were added in to achieve models of the current situation. The process of developing the basin models was an iterative, peer reviewed calibration process subject to stakeholder comment at several critical junctures. The naturalized flows and subsequent development of the basins now form an accepted and legal basis for future water allocations. Currently, similar activities are ongoing to provide calibrated and verified models of the state's groundwater aquifers and usage.

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ENV-28

ADDITIONAL COMMENTS ON CALSIM II
PERTINENT TO THE TEMPORARY RESTRAINING ORDER

February 7, 2006
By: Arve R. Sjovold

On reading the Court's decision on our temporary restraining order, I tossed over in my mind the defendant's assertion about using CALSIM II for its relative accuracy. As I discussed with Dave Owens, the relative accuracy claim only has credence if they have established an accurate baseline upon which to impose the relative findings. This is of course totally lacking in their studies because the present operations cannot explain why the Delta ecosystem is crashing at existing pumping levels. Until this is done the BOR or DWR cannot make any valid claim that additional pumping will not harm the environment significantly.

More importantly, CALSIM II, as it is presently structured, is not capable of assessing relative harm to the environment. That is because the environmental constraints that affect the projects are hardwired into the software and are left unchanged while they study scenarios with more pumping. It is unrealistic to assume that constraints (most of which have little to do with species and more to do with water quality) developed in adversarial proceedings before the SWRCB when the projects were pumping less water are sufficient to protect the environment at any higher pumping levels. CALSIM II merely assumes that the SWRCB standards are some kind of absolute standards that will protect the environment forever after, independent of pumping levels. In fact, any proposal to increase pumping over historic levels when the standards were adopted should return to the SWRCB for review and adjustment.

It is also noteworthy that CALSIM II's treatment of the environment involves perfect foresight due to the way it is implemented. This foresight is evident in the way CALSIM II uses its indices to set environmental flows in the Delta. Once the model has established (with near perfect foresight) what the coming water year will look like, it is free to then seek to maximize the extraction of water from the Delta without regard for environmental damage. In other words, CALSIM II is far from conservative or objective when it comes to simulating hydrology and operations. What is needed is to remove the present scheme of indices as they are presently used in CALSIM II and to try and configure the model to allow environmental variables to be dependent on simulated operations. The present model construction is ill-suited for environmental impact analysis.

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Musings on a Model: CalSim II in California's Water Community

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ABSTRACT

Computer model results are becoming more prominent in water policy deliberations in California. CalSim II is the most prominent water management model in California, and has become central to a variety of water management and policy issues and controversies. This paper reports on the results of an extensive set of loosely-structured interviews with members of California's technical and policy-oriented water management community regarding the use and development of CalSim II in California. The interviewers reflect on the thoughts of interviewees and how such interview activities can further policy-effective modeling and technical activities for water management. CalSim II is a complex model of a complex part of California's changing multi-purpose water system. As such, analytical controversies and misunderstandings are inevitable. Ideally, a model and its associated data would perform an additional service as a forum to resolve technical controversies and continually improve quantitative understanding of the system. While CalSim II is generally seen as a significant improvement over previous models, a wide variety of ideas are suggested for improvements.

KEYWORDS

CalSim II, water resources planning, water management, regional water planning, model development, Sacramento-San Joaquin Bay-Delta

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INTRODUCTION

Computer models have become increasingly important in the management and planning of California's water resources. The California Department of Water Resources (DWR) and U.S. Bureau of Reclamation (USBR) jointly developed CalSim II to model the State Water Project and Central Valley Project (SWP and CVP, respectively), which form much of the state's surface water storage and inter-regional water delivery infrastructure (DWR 2004).

CalSim II is a simulation model of the CVP and SWP storage and distribution systems that utilizes a linear programming solver in each time-step to route water through a network given user-defined constraints and priority weights. Developers of CalSim (the generalized water resources management model software underlying CalSim II) also developed the Water Resources Simulation Language (WRESL), which acts as an interface between the user and the solver, time-series database, and relational database. CalSim II simulation of the operations of the CVP and SWP systems includes physical, institutional, and regulatory constraints and an objective function composed of priority-weighted operational penalties. California's current regulatory environment is very complex; and that complexity is represented in the model by four regulatory layers: State Water Resources Control Board's Decision (SWRCB) 1485 (D-1485) and SWRCB Decision 1641 (D-1641); Central Valley Improvement Act (CVPIA), Section 3406 (b)(2); and the California Bay-Delta Authority's Environmental Water Account (EWA). While (b)(2) requires that the conditions under D-1485 be known, EWA requires that condition under D-1485, D-1641, and (b)(2) be known. Because the regulatory environments are interdependent, CalSim II simulates each regulatory condition sequentially for one entire year, before moving on to the following year. This sequential simulation of environmental conditions is commonly known as regulatory layers of CalSim II.

While USBR and DWR developed CalSim II for project-related purposes, CalSim II's actual uses have been wide-ranging. As the single official model for California's two largest water projects, CalSim II and its results affect statewide and Central Valley water operations and planning, and are often at the center of technical and policy controversies. Resolution of controversies often requires an initial airing of concerns from all parties, as it is usually difficult to address informally stated technical problems. This is especially true when many parties are involved, representing a wide range of interests and expressing a variety of concerns. As computer model results have played increasingly important roles in policy and planning decisions, technical concerns (and their policy manifestations) have impeded the development and use of serious modeling tools for water management in California. The original and central purpose of this research was to gather the uses, thoughts, and concerns of a broad cross-section of the California water community regarding CalSim II with the intent to facilitate discussion and assessment, and perhaps address these issues more productively. This project also provided background information for a peer review panel convened in November 2003. http://science.calwater.ca.gov/pdf/CALSIM_Review.pdf (Loucks et al. 2003).

Feedback was collected during interviews of 89 individuals who are involved in the management, planning, decision-making, analysis, and/or modeling of California water resources. Information gathered during the interview process includes existing and potential uses of and questions for CalSim II, reasons for selecting this model, views on its strengths and weaknesses, views on alternatives to CalSim II, and features that people would like to see in alternative operations and planning models or in an improved CalSim model. The report to the CALFED Science Program and its peer review panel presents the detailed methodology and summary of these interviews (Ferreira et al. 2004). The collected uses, thoughts, and insights regarding CalSim II should be useful for:

- Purposes of external review,
- Identification and prioritization of further model development activities,
- Education and outreach activities that would make the model (and modeling in general) better understood and more useful, and
- Better practical understanding (and perhaps ultimately better scientific understanding) of modeling and its complex role in water management in California.

2.

Technical discussions usually benefit from open airing of technical concerns. We hope this paper and its underlying report provide such benefits.

For the California water community, this paper provides a concise overview and insights regarding the roles, problems, and concerns for water operations planning modeling. For researchers and technical managers, this study presents and illustrates a qualitative field method for gaining a better understanding of complex and controversial technical topics and highlight some challenges for the development and use of CalSim II and other models of the California water system.

METHODOLOGY

Surveys and interviews are commonly undertaken for research purposes. However, unlike most interview research, the intent of this particular project was not quantitative or scientific hypothesis-testing, but qualitative and applied, to extract from a broad selection of California's water management community their impressions, concerns, and uses for the CalSim II model. As such, a loosely structured interview process with emphasis on clear and verified interviewee statements of their ideas was developed (Bailey 1978). No attempt was made to assess the frequency of ideas contributed by interviewees. The frequency of responses or thoughts was not relevant for most intended purposes of this research. These interviewee-validated statements of uses, impressions, and concerns are available in the appendix of a report (Ferreira et al., 2004), with a systematic consolidation of these comments being presented in the report itself for easier reading and use by model developers, reviewers, users, and policy-makers.

Since most members of the interview team are also active in computer modeling of California water management (albeit not using CalSim), special potential problems and opportunities arose. As such, the process had some elements of a classical participant-observer study (Gans 1967; Whyte 1955), especially as reported in the latter part of this paper. The potential problems of having interviewers interpret interviewee responses based on the interviewers' experiences were mitigated by having multiple interviewers (for all but one interview), with all interviewers reviewing draft summaries of each interview for verisimilitude with interviewee statements. These draft summaries of each interview were then returned to interviewees with ample opportunity for correction or expansion. The interviewers' prior acquaintance with modeling water problems in California provided advantages for understanding many of the points made by interviewees, facilitating consolidation of comments in the report, and hopefully communicating these thoughts for later use.

Interview procedure

The research team developed and followed standardized procedures to arrange and conduct the interviews. Ninety-five individuals from California's water community, including staff from both DWR and USBR (the agencies that created, own, and manage CalSim II) and individuals affiliated with consulting firms, water districts, environmental groups, and universities, were contacted, of whom 89 agreed to participate in the interviews. Potential interviewees were selected from the members of the California statewide long-term planning (California Bulletin 160-03) advisory committee, from discussions with individuals known to be active in development and use of CalSim II, and from suggestions provided during the course of the interviews. A summary of interviewee affiliations is presented in Table 1. After being contacted, interviewees received a document describing the purpose of the CalSim II interviews, the questions they would be asked during the interview, procedures for interview write-up and review, and policies for attribution.

Table 1. Affiliation of interviewees

Affiliation	Number of Interviewees
DWR	23
USBR	13
Public Water Purveyors	18
Other Government Agencies	5
Non-Profit	5
Universities	1
Consultants	24

The research team conducted interviews either individually or in groups, with group sizes ranging from two to five. In total the team conducted 65 interviews (16

groups and 49 individual) between April 30 and August 28, 2003. Each interview followed a common questionnaire (available in Appendix A of Ferreira et al. 2004), focusing on how the individual and his/her organization currently use CalSim II, would like to use the model, or plan to use the model in the future, as well as more open-ended questions to solicit the individual's full range of thoughts and suggestions regarding CalSim II. The responses were extensive, varied, and at times contradictory. Typical interviews lasted one hour, but some lasted as little as half an hour or as long as two and a half hours.

In all but one case at least two interviewers were present for each interview. Each member of the interview team took hand-written notes during the interviews, none of which were tape-recorded. After the interview was completed, the team wrote a summary and sent it to the interviewee or "lead interviewee" for group interviews. The interviewee then had two weeks to revise and/or extend the summary of his or her interview. Each interviewee had the option of having some, all, or none of the interview summary included in the remarks "Not For Attribution." All of the summaries of the interviews with DWR and USBR personnel were designated "Not For Attribution." Interviewees also had the option of submitting separate written statements, documents, or materials for inclusion or citation in an appendix of the report.

After finalizing the summaries, the research team aggregated the comments into a single database, combining both comments "For Attribution" and "Not For Attribution," and then categorized the comments by topic and content. The *Current and Prospective Uses of CalSim II* section presents the range of analysis to which users apply CalSim II. The section entitled *Interviewee Thoughts and Suggestions* describes remarks regarding the perceived strengths and weaknesses of CalSim II. The results presented below are based on what was heard during the interviews and, to the extent possible, do not contain the opinions of the research team. In the subsequent section entitled *Discussion of Results* the interview team presents its own thoughts on CalSim II and its future management and development.

CURRENT AND PROSPECTIVE USES OF CALSIM II

Current uses of CalSim II include policy planning studies, system operations, facility planning, regulatory compliance, model development, water management, impact estimation, and policy evaluation. Interviewees often use CalSim II with other models, as its output serves as input to numerous economic, hydrodynamic, water quality, operations, and other water planning models at both state and local levels. Table 2 presents a sample of interviewees' current and prospective uses of CalSim II; a full listing and discussion appears in Ferreira et al. (2004).

Table 2. Summarized examples of current and prospective uses of CalSim II

Use	Current	Prospective
Planning Studies		
California Water Plan Update	x	x
SWP Reliability Study	x	x
Integrated Water Resources Planning (local)	x	x
Proposed Facilities		
Storage and Conveyance Projects	x	x
Dam Removal		x
Operations		
Water Temperature Management	x	x
Seasonal Planning (local)	x	x
Real-time	x	
Position Analysis	x	x
Regulatory Analysis and Compliance		
FERC Re-licensing	x	x
Local Flow Standards	x	
EIR/EIS	x	x
ESA Consultations	x	x
Evaluation of Management Options		
Water Transfers	x	x
Conjunctive Use	x	x
Groundwater Banking	x	x
Other		
Gaming Exercises	x	x
Hydropower Generation	x	x

INTERVIEWEE THOUGHTS AND SUGGESTIONS

Most interviewee comments relate to CalSim II's strengths and weaknesses, suggestions regarding CalSim II technical support and development, and broad conclusions about the model's effectiveness in meeting the diverse goals of the many users of CalSim II results. Interviewee thoughts and suggestions were classified according to five major categories and 36 subcategories (Table 3). Some of the most prominent themes that emerged from the hundreds of individual comments are summarized below according to five major categories presented in Table 3. The comments in the *Mission* section highlight the purposes and uses of the model. *Administration* refers to how DWR and USBR manage, direct, and supervise CalSim II and related activities. *Implementation* refers to how the CalSim software is applied to the SWP/CVP system. *Inputs* refer to the data required by CalSim II for each model run. Finally, *Software* refers to the general water resources simulation software package, CalSim, and is not specific to its application to the SWP/CVP system. Many other comments, not mentioned below due to limitations on space, appear in the larger report (Ferreira et al. 2004).

Mission

Prior to CalSim II, DWR and USBR had independent models of the Central Valley projects (DWRSIM and PROSIM, respectively). The two models had different sets of hydrologic data and treated project operations differently. There is wide agreement that cooperation between DWR and USBR has improved greatly as a result of their joint modeling effort to develop and maintain CalSim II. In addition, the use of a single, standard modeling tool and data set has greatly improved the general modeling environment in the California water community. Work now focuses more on substantive issues, rather than on differences between competing models.

While there is consensus that CalSim II represents a step forward, there is also consensus that it needs further improvement in a variety of areas. Many interviewees assert that CalSim II developers did not think through the questions that CalSim II would be asked prior to building the model, and so it is poorly suited to address many of the questions for which interviewees need answers. However, many see CalSim II as the only tool available for such questions, especially for modeling the CVP and SWP systems. The limited (or seemingly limited) modeling options for California water mangers leads to the perception that CalSim II is often misused, misapplied, or over-stretched. Some feel

Table 3. Categorization of Thoughts and Suggestions

Major Category	Sub-Category
I. Mission	A. General Comments
	B. Uses of the Model
	C. Model Scope
	D. Consensus Model
	E. Comparative vs. Absolute Applications
	F. Geographic Scope and Scale
	G. Other
II. Administration	A. Support
	B. Documentation
	C. Management of Model Development
	D. Credibility
	E. Revisions and Updates
	F. Calibration
	G. Benchmark Study
III. Implementation	A. Mathematical Formulation
	B. Operations Representation
	C. Model Complexity
	D. Time Step
	E. Model Flexibility
	F. Representation of Management Options
	G. Stability/Sensitivity of Model Results
	H. Geographic Representation
	I. Run Time
	J. Other
IV. Inputs	A. General Comments
	B. Demands
	C. Hydrology
V. Software	A. Solver
	B. GUI (Graphical User Interface)
	C. Output/Post-processor
	D. Database/Data Management Software
	E. DSS (Data Storage System)
	F. WRESL (Water Resources Simulation Language)
	G. Transparency
	H. Simulation vs. Optimization
	I. Other

that DWR and USBR have already invested too much time and money in CalSim II to be able to objectively ask if the model can answer the questions asked of it, and if not, then what can and/or should be done.

A primary area of concern among interviewees is CalSim II's ability to perform comparative and/or absolute analyses. Comparative modeling examines differences between multiple model runs to evaluate the effects that varying a condition, facility, or operating policy will have on the system, while absolute (or predictive) modeling directly estimates what is likely to happen to the system given a single set of inputs. There is general agreement among interviewees that CalSim II is an appropriate tool for comparative studies, but there is no such consensus regarding absolute studies. Many interviewees feel that using CalSim II in absolute mode is risky and/or inappropriate, but they have no other option because there are no other agency-supported alternatives. To that end, many interviewees want DWR and USBR to either improve CalSim II's predictive capabilities or create a predictive companion model. If users are to apply CalSim II in an absolute mode, many believe that detailed documentation of known limitations and weaknesses, a better understanding of the uncertainty associated with results, and additional effort towards the calibration and testing of the model are imperative.

The huge range of expectations that the California water community has for CalSim II exacerbates this problem of perception. Model developers promised that CalSim II would be easy to use and accessible; in reality, it is a complex model of a complex system that requires significant expertise to run and understand. As a result, only a few individuals concentrated in DWR, USBR, and several consulting firms understand the details and capabilities of CalSim II. Thus, much of the rest of the water community feels left in the dark regarding what CalSim II can do, how to use it, and where to find further guidance. This widespread confusion and uncertainty has eroded CalSim II's credibility outside the small circle of knowledgeable users, as it is difficult to trust a tool that one is unfamiliar with and does not understand. Many indicate that reducing these uncertainties would improve the model's credibility.

Administration

Interviewees commonly mentioned a need for more people who can run CalSim II. The current need for model runs outstrips the number of people who can produce them. This situation is likely to worsen as the demand for CalSim II runs continues to grow. CalSim II's complexity is daunting to new and potential users, and so very few individuals can conduct an entire model study and produce good quality CalSim II runs. This shortage of expertise means that DWR and USBR may be unable to produce CalSim II runs quickly, reducing the usefulness of the model, as it is effectively inaccessible due to the lack of qualified modelers. In addition, the narrow circle of knowledgeable CalSim II users contributes to the perception that CalSim II is a "closed shop" available only to a few insiders. Finally, a small group of users limits the power of CalSim II as an analytical tool, as some see CalSim II's potential power and utility expanded by having a broad spectrum of groups representing different perspectives on water management debates. There is also concern that CalSim II analyses are considered "good" or "acceptable" only with the approval of a select group of individuals who are very familiar with California's water system. A larger pool of users is likely to broaden this circle and dilute the influence of individuals. In the absence of expanding this group, or until the number of experienced users has increased sufficiently, there may be value in creating a standing review group or some other method to certify studies. In general, interviewees agree that DWR and USBR should actively seek to expand the group of expert users, especially to include non-agency and non-consulting users.

To further this goal, many interviewees recommend that DWR and USBR create a centralized source of support for CalSim II users. They would like a help desk or website to provide information on assumptions made in the model and guidance regarding model code, logic, and structure. Tutorials for running CalSim II and interpreting its results, software utilities with which to download data and perform statistical analyses of results, answers to common questions, and results from a sample CalSim II run would also further this cause. In addition, the agencies should expand the existing CalSim II training course to address both the logistics of running CalSim II and the subtleties

required to understand the meaning of its output and its appropriate application. A well-publicized user group also could provide many of these services, distributing information to model users from many interest groups efficiently, and thereby expanding the skill base and reducing the perception of CalSim II as a "closed shop." Similarly, many interviewees feel that some CalSim II managers are defensive in the face of criticism and that including more stakeholders in the development process or providing a forum for input from model users will enhance CalSim II's acceptance and credibility.

All users agree that CalSim II needs better documentation of the model, data, inputs, and results. CalSim II is data-driven, and so it requires numerous input files, many of which lack documentation. Documentation of assumptions is spotty and very technical when it exists, making it difficult for anyone other than model developers to understand how CalSim II arrives at its results. Poor documentation of the conceptual model means that it takes a long time for users to answer seemingly trivial questions and it is difficult for new users to learn how to use the model at all. Overall, the lack of clear and comprehensible documentation increases the likelihood of misunderstandings regarding how the model functions and it contributes to the common impression of CalSim II as a "black box" whose inner workings are beyond the comprehension of most users. This also makes CalSim II runs difficult to duplicate, eroding the model's credibility.

CalSim II is still relatively new and so many users are unsure of and thus uncomfortable with its limitations. They want more information on the model's limitations, including a clear description of what the model does and does not do well. In addition, information on the uncertainty associated with CalSim II results in the form of error bounds, ranges for individual values, or statistical parameters (e.g., mean, variance, etc.) would inform users about the limitations of specific outputs, which is particularly important when users run CalSim II in absolute mode.

There is considerable debate about the current and desirable state of CalSim II's calibration and verification. Some efforts have been made to calibrate the model, but many interviewees express concern that this effort is insufficient if the model is to be run in absolute mode. In addition, DWR and USBR have released a benchmark study to provide a baseline case from which users create alternative scenarios and to which they compare results of alternative runs. This benchmark study has changed with ongoing modifications to CalSim II. Many model users and potential users look forward to a complete, unchanging benchmark study to provide a stable point of reference for other analyses.

Implementation

CalSim II is at once both too simple and too complex. Its representation of the SWP and CVP includes many simplifications that raise concerns regarding the accuracy of results. At the same time, CalSim II is so complex that it is difficult to understand and requires several hours to run. Interviewees express numerous concerns about specific details of CalSim II's implementation, only a few concerns which seemed more prominent and informative are addressed here.

CalSim II's complexity reflects the complexity of the California water system. However, this makes the model cumbersome and difficult to learn. The difficulty in learning and running the model has been a source of frustration to many users and potential users, and there is a common consensus among respondents that CalSim II should be more user-friendly so that stakeholders can run the model without hiring consultants. Just as CalSim II is complex and difficult to understand, so are its results. Many interviewees indicate that interpreting CalSim II results requires not only experience with the model, but also knowledge of the CVP/SWP system and of linear programming. Model users require significant time to determine if results are reasonable and very little guidance on this topic is available from model developers. Also, some claim that there are no specific criteria to define a "good" model run or post-processing tools to help visualize, interpret, correct errors, and obtain answers to common questions. There is additional concern that CalSim II's formulation should be more robust so that runs are not user-dependent. Starting from the same point, different model users likely will produce different CalSim II outputs because during a CalSim II run, the model user generally views intermediate results and adjusts model parameters until he/she

reaches an acceptable result. This adds to inconsistencies across CalSim II runs, making results more difficult to interpret. Finally, CalSim II's complexity and its many layers have resulted in a model that requires several hours to run, frustrating planners who need to explore many refinements to alternatives.

Many interviewees are concerned that CalSim II's monthly time step cannot capture hydrologic variability adequately and thus does not compute water exports and export capacity accurately, both of which are significant factors in system operations. The model's inability to capture within-month variations sometimes results in overestimates of the volume of water the projects can export from the Sacramento-San Joaquin Bay-Delta and makes it seem easier to meet environmental standards than it is in real operations. Many of the system's operations function on a shorter time scale and so CalSim II cannot represent them well given its current formulation. On the other hand, it is unclear if reducing the time step would be either more accurate or more useful, given the additional data and assumptions that would be needed to characterize the system. Some fear that moving to a daily time step might worsen some problems due to questions regarding the precise timing of short events.

Interviewees cannot always determine the parameters to which CalSim II is highly sensitive or its overall stability and sensitivity. They feel that the linear programming formulation allows multiple solutions, which can differ considerably. Small changes in CalSim II input can result in large changes in model results, causing difficulties in impact analyses and the defensibility of model results. In addition, some users note that the multiple layers of regulations and operational agreements included in CalSim II may obscure the effects of the change to the system being modeled.

Inputs

Many interviewees indicate that CalSim II represents demands simplistically using out-of-date values and calculations. Specifically, they believe that demands should be based on land use and should be sensitive to economic factors such as the unit price of water. Without a better basis for the demands in CalSim II, many question the model's validity and capabilities.

Some interviewees also want to see further improvement in CalSim II's representation of hydrologic processes. They feel that it is weak enough to undermine the entire model, as errors in this input propagate through each layer of the model. Many claim that CalSim II's hydrology uses data and methods that are decades out of date and rely on too coarse a geographic scale. In addition, some feel that development of a hydrology should be based on land use patterns and include thorough documentation. Despite these significant concerns, interviewees agreed that CalSim II's joint hydrology (agreed upon by both DWR and USBR) is an improvement over those used by each agency for its previous model.

Software

Model users express general frustration with CalSim II's commercial linear programming (LP) solver. They contend that it provides little information on the location of infeasibilities, so that even a knowledgeable individual may need many days to debug a run. In addition, the solver sometimes produces non-unique solutions and running identical scenarios on different computers seems to generate different results. Several model users state that the solver does not provide any of the sensitivity analysis that LP solutions usually offer and gives no indication of which parameters are constrained, so that users have to search for this information on their own. However, many interviewees feel that the use of an optimization engine for CalSim II is a step forward from previous models and that it is appropriate given the regulatory structures that it tries to model. Others are unsure of how the optimization engine works within CalSim II, while some feel that an optimization approach does not make sense given the many constraints of the SWP and CVP systems.

Individual users are developing their own post-processing techniques, creating the potential for inconsistencies between analyses. They would like visual tools with which to present and compare multiple CalSim II runs. Interviewees expressed interest in tools, both computational and especially visual, that would make it easier to compare results across runs.

Users would like a more intuitive, geographically referenced interface to facilitate the understanding of both

inputs and outputs. It would be helpful if the interface could show the current CalSim II schematic, allowing a user to click on a node and see relevant information including input data, metadata, water balances, and information on the location of relevant equations.

Interviewees applaud CalSim II's inherent transparency as a data-driven model. However, some find the vast number of input files required by CalSim II daunting, thus reducing the effective transparency. In addition, CalSim II includes no automated quality control mechanisms for its many input files, resulting in a time-consuming, generally manual process for setting up a CalSim II run that leaves substantial room for error. Interviewees largely agree that CalSim II would be easier to use if it had a simpler and more coherent data management system. Particularly desirable functions include the archiving of calculation files and the ability to conduct multiple traces of dependencies.

DISCUSSION OF RESULTS

The section above is a brief distillation of the remarks heard during the interview process, absent, to the extent possible, of the research team's opinions. They include many of the most common and interesting points raised throughout the interviews. During the analysis of the many interviews, the research team developed its own thoughts regarding CalSim II and its future development and management. While these clearly are informed by the interviews, this section represents the opinions of the research team. Some of these conclusions are similar to those in the report of a subsequent external peer review panel (Loucks et al. 2003). Our conclusions below are organized around three areas.

Broader involvement in development and use

CalSim II is a significant improvement over previous models of the CVP and SWP systems. A publicly available model, CalSim II uses a modeling approach that affords a flexible, expandable, data-driven, and more transparent modeling framework than alternative and previous models. These modeling features are a remarkable achievement for the developers of CalSim II. DWR's and USBR's agreement to use a single model and underlying data sets has facilitated this significant accomplishment. This consensus has allowed the two agencies to devote resources to develop a single tool rather than critiquing each other's model, as seemed common in the days of PROSIM and DWRSIM.

Despite the advancements of the CalSim II modeling efforts, the consensus between DWR and USBR needs to extend beyond the two agencies. Although both agencies have made attempts to include outsiders in the model development process, CalSim II might have been a much better model had a broader range of stakeholders been more integrally involved during its development. The knowledge and expertise that stakeholders could have brought to the fore would have allowed model developers to better represent the operations and water demands of many local water agencies, particularly how local operations interact with and affect the CVP and SWP systems. This would allow model developers to implement more realistic water demands, in terms of both land use and alternative management options available at the local and regional levels. More importantly, the inclusion of stakeholders in the early stages of model development would have provided developers with crucial insight regarding current and prospective modeling needs of the water community and helped broaden the model user community.

The disconnect between CalSim II developers and the broader California water community is one of the greatest obstacles to CalSim II's acceptance. In part, this obstacle stems from the limited institutional charge of model developers to model only the CVP and SWP systems, and not California water management more generally. Broader and more serious effort on the part of CalSim II developers is needed to raise CalSim II's credibility among stakeholders. To gain credibility among stakeholders it is imperative that model developers see CalSim II as "outsiders" see it. That is, DWR and USBR should more fully commit to communication with the wider California water community through a well publicized, open, and available channel. This communication channel should be a way for outsiders to provide feedback to DWR and USBR regarding their modeling needs and for model developers to provide information and assistance to

model users. For CalSim II to be effective for policy and planning purposes it must be seen as more widely accepted by stakeholders, something that seems unlikely to happen unless (i) stakeholders are involved in ongoing model development, (ii) CalSim II is seen as a useful model to stakeholders, and (iii) more people around the state are comfortable using the model and interpreting its results.

Continuous improvement for contemporary problems

A significant consequence of not including more stakeholders in the early phases of CalSim II development is that the current versions of CalSim II are ill-suited for many of the current analysis needs of the broader water community, particularly absolute applications. Current California water management differs considerably from a decade or two ago, when models that were designed for comparative applications were adequate for most analysis needs. Compliance with legislative provisions regarding both the environment and water availability for new land development requires much more accurate and non-comparative quantitative results than before. While CalSim II developers like to promote it as a model best used for comparative analysis, there is a clear need for a model for absolute purposes. Many local agencies and other stakeholders (including DWR) are employing CalSim II to develop non-comparative, absolute estimates of short- and long-term water deliveries. Therefore, given the issues facing California's water resources and the analysis needs of the water community, it seems unrealistic to expect that modelers only will use CalSim II for comparative analysis. Under the mantra of "the best available tool" (in this case the only available tool), CalSim II is being used, and will continue to be used, for many other types of analyses for which it may be ill-suited, including in absolute mode. Considering the setting in which CalSim II exists, its developers should work toward a model appropriate for absolute applications.

For use in absolute applications, CalSim II needs adequate calibration and testing against recent historical data. (Some very preliminary exploratory work has begun in this direction (DWR 2003).) As with any other type of study, calibration and testing results must be accompanied by a self-critical analysis indicating where the model performs well and where it does not, as well as how this will affect studies that use CalSim II results, both in comparative and in absolute mode, and why. This type of self-critical information is essential. Only when model limitations are understood better will CalSim II gain broader and deeper credibility and acceptance within the water community, and needed improvements can be better pursued.

In addition to the need for a model that can be used in absolute mode, there is also widespread demand for a model that encompasses more than just the SWP and the CVP elements of California's inter-tied water system. The desired model or modeling framework would include not only more of California geographically, but also represent a wider range of water management opportunities and options. For CalSim II to be a truly statewide model it needs to cover the Bay Area, Tulare Basin (including the Friant-Kern and Madera canals, eastside San Joaquin reservoirs, and Millerton), Yuba River Basin (for potential water transfer opportunities), Colorado River, Colorado River and Los Angeles aqueducts, and local Southern California projects.

Coupled with a need for greater geographic coverage, CalSim II should include management options available in California at the regional and local levels. Inter- and intra-agency water transfers are now commonplace, as are other management options such as groundwater banking, conjunctive use, desalination, and water conservation. Consequently, to effectively simulate the array of water operations available within the State, CalSim II needs to include a wider range of management options, facilities, and regions. It is vital that those involved in the management of California's water be able to analyze how local, regional, and state facilities and options best go together. California does not currently have a model or modeling framework capable of such integrated analysis, to parallel the kinds of integrated management thinking being pursued at local, regional, and statewide levels.

Accessibility

Along with serving the needs of the water community, acceptance of CalSim II will increase if more people are able to use and understand the model. Consequently, DWR and USBR need to widen the pool

of model users (a problem DWR and USBR managers often note). Unfortunately, the current narrow circle of knowledgeable CalSim II users contributes to the perception that CalSim II is a "closed shop," available only to a few insiders. This perception also raises concerns about conflicts of interest, as skills on which many diverse stakeholders rely are concentrated in the hands of a few consulting firms, DWR, and USBR.

To widen the group of CalSim II users, DWR and USBR should provide a much greater level of user support than presently available. More frequent training workshops, a comprehensive manual/user's guide, a help desk, and online tutorials could supply much needed assistance to current and prospective CalSim II users. Better pre- and post-processing tools should be available to make the input process more automated and less prone to user error and to facilitate comparison, retrieval, viewing, and result interpretation.

Such attempts, however, should not replace thorough model and data documentation and version control, something that CalSim II currently lacks. CalSim II is unavoidably a very complex model and thus requires comprehensive documentation to enable users to understand the model framework and, more importantly, the sources and methodology used in the derivation of input data, including their limitations. It is difficult to attain credibility when the model and data are seen as impenetrable, particularly when model results run counter to many people's understanding of the system. Counterintuitive results are not necessarily infrequent or bad outcomes for a complex model of a complex system serving diverse stakeholders.

Model documentation should include information regarding appropriate uses of the model, data and model limitations, and error bounds on output values specific to the various purposes for which the model can be used. An often-mentioned frustration of many would-be model users is the lack of guidance on (i) how to appropriately interpret model results for various applications and (ii) what constitutes an acceptable model run.

As with any model, it is much easier to perform a good run if the user thoroughly understands what is being modeled. Understanding California's water system allows the model user to determine whether or not a particular run is "good" and to interpret its results. However, this should not be an excuse not to provide guidance on determining what constitutes a good model run and what must be done to attain a good run. If there are people who can evaluate a set of model results and determine if they are appropriate (and if not, how to modify model inputs to achieve adequate results) then that knowledge should be made available in the public domain, perhaps in the form of a post-processor. Such a post-processor should include guidelines for the appropriate interpretations of model results for various types of applications, including the use of monthly model results to assess impacts that depend on operations and processes that occur at a sub-monthly time-scale. Such a post-processor might not be a final certification of a model run, but would provide an initial screening.

A major problem facing CalSim II developers is that the system they try to model is extremely complex, particularly in light of numerous environmental requirements that must be modeled sequentially. While some people criticize CalSim II for doing too much and therefore being too complex, others believe that CalSim II is not comprehensive enough. Consequently, CalSim II is simultaneously seen as both too complex and too simple. This apparent dichotomy can only be resolved if CalSim II is made truly modular. Modularity would allow model users to turn features, regions, or layers of disaggregation on or off depending on their modeling needs. Modularity could also reduce model run time for many purposes and allow model users to apply CalSim II more efficiently in the early stages of screening alternatives.

THEORETICAL CONTEXT

The theme of opening CalSim II to a broader set of users is consistent with a growing body of literature on the value of combining policy and technical processes, rather than letting one lead the other (Sabatier 1999). While much of this literature focuses on how decision makers plan large infrastructure projects or manipulate natural resource systems, their lessons apply to the development and use of CalSim II, a complex model with significant policy implications.

The importance of including affected parties is now broadly accepted in project planning (WCD 2000; Delli Priscoli 2004). Beginning with research in ecosystem dynamics in the 1970s (Holling 1978), the concept of adaptive management and the integral use of computer models in environmental management and policy-making has grown to influence a variety of disciplines. Traditional methods of centralized planning for projects that affect a broad array of stakeholders based on technical expertise have largely given way to more holistic approaches that solicit input from a wider variety of sources and perspectives (NRC 2004). Within water resources management, this approach has been applied to projects as varied as restoration of the Everglades in Florida and the planning and construction of high dams in developing countries (NRC 2003; WCD 2000). The vast majority of the stakeholders interviewed about CalSim II expressed some interest in a more inclusive process for the ongoing development and improvement of the model. This broader literature supports many interviewees' assertion that CalSim II would benefit from their input, as the inclusion of multiple stakeholders in this process is likely to improve both the performance and acceptance of a complex project such as CalSim II (Lee 1993).

DISCONTENT AND MODEL DEVELOPMENT

Based on the concerns voiced by the interviewees during the interview process and on the impressions of the research team there exists significant concern regarding the abilities and applicability of CalSim II to California's large inter-tied water system. A simple reading of the summaries from the interviews could leave one with the impression that discontent with CalSim II in the water community is a serious impediment to the model's success. However, discontent with an analytical tool is not necessarily unhealthy or avoidable. Voiced concerns are a sign that the model is being used, produces useful insights, and encourages more systematic discussions of system details. Concerns also often provide a positive basis for model improvement.

Investments, both in terms of money and time, in analytical tools for decision-making usually arise from discontent with unaided decision-making. Technical development often follows six stages:

1. Informal statements of concerns;
2. Formal statement of concerns;
3. Assessment of concerns;
4. Plans to address concerns;
5. Actions to address concerns;
6. More (and hopefully different) concerns (repeat step 1).

The development process is by no means linear (BDMF, 2000). Stages can overlap and there is still the likelihood that new concerns will arise even after the effort is made to address the original concerns. Thus the development process is circular, reflecting evolution of the model, greater understanding of the system, and changing thoughts regarding management and policy problems.

If the technical end product was useless, its audience would ignore it entirely and the cycle would end without having successfully addressed the concerns. Many concerns will appear internally within the technical development team working on the products; such comments usually require less communication effort since they are already internal to the development team. New concerns also arise as the field problems to which the model is applied change. Such concerns are a sign of success, as the model is considered worthy of being stretched or adapted to address new problems. Finally, some concerns indicate great success from a model when they arise because model users demand further refinements as they ask more probing questions of the system.

In the case of CalSim II both the user community and the development team have raised concerns. Some of these concerns are quite positive in that the model is being asked to address new and expanded problems in more precise ways, going beyond the model's original narrow SWP/CVP scope. Ultimately, the broader the range of individuals involved with the on-going development of the model, the better the product likely will be. The fact that so many individuals have concerns regarding the uses and applicability of CalSim II is a sign that the model is being used and is worthy of on-going applications, discussions, and development.

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An Environmental Review of CalSim-II:

Defining "Full Environmental Compliance" and "Environmentally Preferred" Formulations of the CalSim-II Model

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one of the main problems w/ CalSim II, as I understand it, is that the model treats groundwater as an infinite supply

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Preface

The "Environmental Review of CalSim-II" was undertaken at the request and under the sponsorship of Water For California, a non-profit organization dedicated to sound stewardship of the State's waters. The original work statement given to the Natural Heritage Institute requested that they examine the CalSim-II code to establish the requirements to meet two specific standards: one, to determine what changes in the data inputs and the code would be necessary to capture "full compliance" with the legal mandates under which the State Water Project (SWP) and the Central Valley Project (CVP) operate; and the second, to establish in a similar fashion the changes in data and code which would be required to perform an "an environmentally preferred" analysis.

This report is prompted by the use of CalSim-II by agencies as the preferred tool for environmental impact analysis, even though the model is constructed as an optimization model for maximizing exports given certain hydrology and constraints. This report raises a number of important questions and issues with regard to the way CalSim-II is being used.

The "full compliance" option was deemed necessary because present operations of the projects are not fully implementing measures sufficient to meet legal and regulatory requirements promulgated to protect and restore important fisheries and habitats. These deficiencies include directives of the State Water Resources Control Board, the CVPIA's Anadromous Fishery Restoration Programs (AFRP), and more. Each affects operational requirements on dam and pumping operations to protect fisheries and Delta water quality standards. It is important for the investigation to determine just how the code treats these legal directives on the operations of projects and to determine how the CalSim-II model could be used to investigate the impact on project operations if these directives were followed.

The "restoration planning" option was held to be necessary because it was plainly apparent that existing operations, even with expected stricter adherence to the spirit of the environmental limitations, were not effective in redressing the damage that has been incurred to the environment over the lives of these projects. Simply put, the projects, including the present format of CALFED, do not appear adequate to restore health to the Delta and the fisheries as was intended by these programs and as directed by the Endangered Species Act. Again the investigation was required to determine what additional requirements and changes might be added to CalSim-II to move us in the direction of environmental restoration.

We anticipate that implementation of the proposed changes to CalSim-II will elevate environmental objectives to the same level afforded consumptive water uses in water resource decision-making.

This report is prompted by the use of CalSim-II by agencies as the preferred tool for environmental impact analysis, even though the model is constructed as an optimization model for maximizing exports given certain hydrology and constraints. It raises a number of important questions and issues with regard to the way CalSim-II is being used. We anticipate that implementation of the proposed changes to CalSim-II will elevate environmental objectives to the same level afforded consumptive water uses in water resource decision-making.

Water for California
November, 2005

Executive Summary

CalSim-II is being used in almost every significant water planning process underway in California. When the outcome of a planning process hinges on modeling results, even partially, the assumptions and assertions that lead to these results should be accurate and transparent. Unfortunately, the 2003 peer review of CalSim-II raised a number of concerns about the applicability of the model to these important planning processes. The report published here, *An Environmental Review of CalSim-II*, was prepared in order to improve the transparency of CalSim-II and to measure the current version of the model against two important standards. This report is purposely focused on and limited to two specific questions.

1. **Does the representation of environmental regulations and objectives in CalSim-II represent full compliance with current legal requirements?**
2. **Can CalSim-II be used to plan for water management alternatives associated with improve environmental outcomes and habitat restoration?**

This report does not deal with any of the other CalSim-II issues identified in the CalSim-II Peer Review. The Natural Heritage Institute (NHI) was engage to carry our technical analysis needed to answer these questions.

Full Compliance

The first question is posed in order to assure that the current formulation of CalSim-II is consistent with all current environmental regulations on California's water resources. CalSim-II attempts to characterize all components of the regulatory structure. This report reviewed a significant but limited subset of these regulations. Those reviewed were selected based on the experience of a panel of environmental experts. This selection does not imply that characterizations of other regulation in CalSim-II meet the full compliance standard. In fact, it would be very valuable to complete a similar analysis on the model characterization of all environmental regulations.

Results With regards to the Full Compliance standard, NHI identified three areas where the assumptions and assertions in the current version of CalSim-II were at odds with the expert panel's interpretations of existing environmental regulations:

- **CalSim-II uses information not available to real time operators of the California water system.** This allows CalSim-II to relax environmental standards earlier than is the case in actual operations. As a result, the model under-allocates water needed to satisfy existing environmental regulations; in turn, the model makes that water available for export to south of Delta contractors or other uses.
- **CalSim-II is not faithful to Federal law that allocates water to meet ecosystem restoration objectives.** The 1992 Central Valley Project Improvement Act calls for 800 TAF of water to be allocated for environmental regulation and the logic of CalSim-II does not fully honor this requirement.
- **CalSim-II currently includes no requirement to maintain a minimum flow in the San Joaquin River below Friant Dam**, contrary to a court ruling requiring such flows. This allows for allocation of water to urban and agricultural uses in the Friant Service area rather than allocating that water to maintain water in the San Joaquin River.

For each of these deficiencies, this report proposes a series of actions that can be taken in order to improve the performance of the model. These should be considered the minimum steps required to meet the Full Compliance standard for the regulations reviewed as part of this effort.

Restoration Planning

The second question is motivated the failure to protect and restore the Sacramento-San Joaquin watershed as legally required. Long-term monitoring of the system suggests that threatened and endangered fish populations are in serious jeopardy. A prudent approach to water management planning would use modeling tools that evaluate the impact of various environmental regulations on water deliveries. CalSim-II has not been crafted to include this flexibility.

Results As examples of the kinds of new regulations that may need to be considered in CalSim-II, the expert panel identified the following regulatory changes that the model should be able to accommodate:

- CalSim-II should have the flexibility to shift salinity compliance points to allow more targeted tributary restoration action. For example, changing the location of the Vernalis salinity standard may reduce the burden on the Stanislaus River.
- CalSim-II should have the capacity to shift required salinity profiles in the Delta (X2) to benefit Delta-dependent species.
- CalSim-II should allow for the prioritization of tributary environmental objectives, such as targeted operation of the Nimbus/Folsom system for the American River.
- CalSim-II should allow for the modification of Delta export restrictions to target improvements in the Delta ecosystem.
- CalSim-II should not count, towards the satisfaction of environmental regulations, water that otherwise would have been releases as part of unavoidable reservoir spills.
- CalSim-II should allow for the definition of flow requirements that result in periods of spring high-flow and summer low-flow conditions in Central Valley rivers.

These changes are consistent with the need to comply with existing environmental laws (CEQA, NEPA, ESA) through the evaluation of alternatives, including those that are the most environmental beneficial. Given the historic difficulty associated with return the Central Valley water system to a viable ecosystem, these changes would allow policy makers to engage in more thoughtful restoration planning. This report includes a workplan to implement these changes. The responses to the proposed actions should be considered markers of the long-term utility of CalSim-II for restoration planning.

Conclusion

Having completed this environmental review of the CalSim-II model, we are left with the profound impression that it is not a tool that can – under its current formulation – fully address the legally required water management objectives. CalSim-II is, after all, a tool that has been designed to determine how best to operate the state's hydraulic infrastructure in ways that maximize the satisfaction of contractual demands. This reality is a result of both the history of water model development in California and a general analytical approach that has held sway for decades in the field of water resources planning and analysis. This approach holds that the environment is a constraint on system operations, not one of the objectives for which the system should be managed. In order to create a tool that can investigate water management innovations designed to comply with the law and restore the environment, it is not simply a matter of adjusting a few input parameters. Instead, a reformulation of the model along the lines described in this document is needed.

CalSim-II holds that the environment is a constraint on system operations, not one of the objectives for which the system should be managed. In order to create a tool that can investigate water management innovations designed to comply with the law and restore the environment, it is not simply a matter of adjusting a few input parameters.

This philosophy of including the environment as an objective in water resources management is gaining credence around the world. Unfortunately, in California we cannot get to this point if we limit ourselves to the current version of CalSim-II. On the positive side, it is clear that no one views the current version of CalSim-II as the final and definitive water planning tool. An effort is underway to develop CalSim-III, which will respond to many of the critiques that have been offered about the model in recent months and years.

The conclusions of this report are offered to constructively contribute to this evolution. We feel that they will elevate, when implemented, aquatic ecosystem restoration to a place alongside of the other water management objectives in the system as is consistent with the imperatives of law and policy. A failure to respond to these critiques would demonstrate, on the other hand, that the water management community has little interest in viewing ecosystem restoration as more that a nettlesome constraint that has to be dealt with, preferably in the most minimal fashion. This would represent a division more profound than some varying professional opinions about the best way to model a complex water resource system.

Approximating Natural Systems in Models

When modeling a natural system, especially a complex one like the Delta and the water systems that support life in it, it is important to consider the context for the modeling effort. This section of the report briefly describes some of the systems and processes impacted by water management decisions. The overall goal of this section is to highlight the need for modelers to understand the natural systems they attempt to represent and for stakeholders to understand the rationale behind assumptions used to represent environmental regulations within water management model logic.

The plants, fish, birds, and other animals that are native to California streams, rivers and wetlands evolved to flourish under the particular climatic and hydrologic patterns of their native watersheds. Prior to development, streams routinely flooded outside of their embankments during strong winter storms and heavy periods of spring snowmelt runoff. By late summer streams ran low and in drought years many sections of smaller rivers and streams dried up completely. In the fall, the first rains would refresh streams and rivers and attract anadromous fish like the fall run Chinook salmon to migrate back up into the watershed to spawning grounds in mid-elevation reaches. Dried-up floodplains and wetlands would begin to fill again in time for the migrating waterfowls to find refreshed habitat.

The riparian forest along California's streams also adapted to these conditions and contributed to the character of the ecosystems in California's rivers and streams. Being inundated throughout much of the winter and spring does not harm the willow, alder, cottonwood and other riparian plants, and the shallow waters around their trunks are important habitat for juvenile fish escaping the faster moving waters in the main currents. In addition, the riparian forest provided much of the food for the aquatic life around them as terrestrial bugs dropped into the waters below.

The seasonal pulses of flow down California's rivers and streams into the Delta interacted with the daily and seasonal tidal fluctuations in the San Francisco Bay to create a shifting pattern of freshwater, brackish water and salt water that was shaped by the complex and shifting flow patterns in the Delta itself to form a mosaic of aquatic habitats. This mosaic supported a complex assemblage of Delta resident plants and animals.

Californians value their native aquatic ecosystems. A system of environmental laws and regulations, including minimum flow requirements and restrictions on water diversions, has been developed in reaction to serious damage to ecosystems including declines and even loss of species and degradation and loss of habitat.

It goes without saying that conditions changed with the onset of water development in California. The building of levees isolated rivers from their floodplains and fragmented the mosaic of ecosystems in the Delta. The construction and operation of dams and diversion works for water extraction changed the natural flow regimes in ways which reduced the amount of flooding and increased the level of flows in managed rivers and streams during the low

flow period. In the Delta, the combined influence of channelization and changes in the flow regime vastly reduced the amount of certain habitat types used by Delta resident species. These changes were counter to the evolutionary tendencies of native plants and animals throughout the system and were often favorable to invasive species.

This synopsis of pre-development California aquatic ecology and the changes that accompanied water development is not intended to serve as a utopian alternative to the highly developed water system that has been constructed in California over the past century. Indeed, the vast majority of Californians, to one degree or another, rely upon the hydraulic manipulations that water development has accomplished. By the same token, Californians value their native aquatic ecosystems. A system of environmental laws and regulations, including minimum flow requirements and restrictions on water diversions, has been developed in reaction to serious damage to ecosystems including declines and even loss of species and the degradation and loss of habitat. This is the environmental regulatory structure that the developers of CalSim-II have attempted to capture in a simulation model of the California water system.

So just what is CalSim-II and how did it come to play such a central role in California water planning? In order to answer these questions a little bit of historical context is required. For several decades, the managers of the Central Valley Project and the State Water Project have used computer models to simulate the operations of their particular projects. The original models, which went by the names of ProSim for the CVP facilities north of the Delta, SanJaSim for the CVP facilities in the San Joaquin Valley, and DWRSim for the SWP facilities, where used to simulate the extent to which facilities could be operated to meet contractual water demands given a set of assumptions regarding legal requirement and the operating environment. They assumed that historic hydrologic conditions were a decent representation of the likely future. The models were not integrated and therefore it was difficult to evaluate the constraints and opportunities imposed by simultaneous operations of the projects. In addition, the models themselves were developed over many years in a somewhat ad hoc manner with new model logic being added over time as new operating and regulatory approaches were articulated. The end result was a set of codes that were complex, relatively unstable, and nearly impossible to navigate and support as many of the original developers had retired or moved on.

By the 1990s this was clearly an untenable situation on several counts. First, the Delta was in crisis. Ecosystem functions were negatively impacted, and salmon and other species were listed under the ESA. Delta water diversions and extraction over a period of decades was understood to be at least a part of the reason for the problems. The Coordinated Operating Agreement between the CVP and the SWP, and the CALFED Bay-Delta Program, called for closer coordination of CVP and SWP operations to respond to the problem and to legal mandates to restore the populations of listed species. Second, the stakeholder community was demanding a more flexible and transparent set of analytical tools at the very time when the pool of competent ProSim, SanJaSim, and DWRSim analysts was dwindling. Finally, advances in the field of water resources analysis and planning were providing more flexible approaches to water resource simulation modeling based on the application of user-defined priorities and preferences rather than the rigid, If-Then rules used in developing the original models. The time was

right to construct a new simulation model of the California water system, and the managers of both the CVP and the SWP committed resources in an effort to accomplish this task.

At this point, a few observations are warranted. While CalSim-II represents an improvement over the original simulation models in terms of its integration of the State's hydraulic infrastructure, it is clearly derivative from those earlier models. Much of the data and logic used in the original models was introduced to CalSim-II. As a result, CalSim-II still seeks to simulate the extent to which facilities could be operated to meet contractual water demands given a set of assumptions regarding the operating and regulatory environment, and assuming that the range of historic hydrologic conditions is representative of future conditions. As in the early codes, the logic of CalSim-II is designed to maximize the degree to which infrastructure can be operated to satisfy contractual demands. In addition, while CalSim-II is more flexible and stable than the earlier codes, it is not transparent to those outside of the relatively small CalSim-II modeling community.

As a result of this situation, significant questions regarding the model's suitability for multi-objective water resource planning have been raised at the very same time that CalSim-II analyses are being used to inform numerous planning and decision-making processes. There exists a nagging suspicion that the model is not amenable to a full consideration of environmental restoration objectives, and there is a real frustration that it is nearly impossible to address this doubt by examining the logic and assumptions contained in CalSim-II.

This report seeks to evaluate the degree to which CalSim-II captures the critical characteristics of the existing regulatory structure and explore how the model could be used to evaluate the implications of environmental management strategies that more closely mimic the natural hydrologic conditions under which native aquatic plants and animals in California evolved.

This report reviews a subset of CalSim-II logic dealing with environmental regulation and seeks to evaluate the degree to which this subset of the model captures the critical characteristics of the existing regulatory structure. A similar analysis should be completed on the entire model by the official CalSim-II development team. This report also explores how the model could be used to evaluate the implications of environmental management strategies that more closely mimic the natural hydrologic conditions under which native aquatic plants and animals in California evolved. The first goal is to assure that CalSim-II correctly models existing environmental regulations. A second goal is to create a model that can be used to explore objectives that go beyond maximizing deliveries to meet contractual demands and which instead seek to balance the restoration of California's aquatic environment with the demands for urban and agricultural water use.

Background on CalSim II

CalSim-II was developed collaboratively by the California Department of Water Resources and the United States Bureau of Reclamation. It is the primary water supply planning tool employed by the managers that extract water from the Central Valley water system. CalSim-II is being used to support numerous studies (e.g. the Integrated Storage Investigation) and environmental processes (e.g. the Monterey EIR), requiring that the model's logic, structure and limitations and their influence on the conclusions drawn from model output be both understood and accepted as valid by stakeholders involved in these efforts.

Developing a model that can be accepted as credible, relevant, and useful by those with an interest in the model results is a central challenge in the use of all water resource planning models. For the CalSim-II model, this challenge is magnified by the overall complexity of the Central Valley water system, and the scale at which operations need to be represented. An important response to this challenge occurred in 2003 when a panel of nationally recognized experts conducted a peer review of the CalSim-II model and published a strategic review of how the model could appropriately support water planning, management, and operations in California[1]. The peer review, which was managed by the CALFED Bay-Delta Program and published by the Association of Bay Area Governments, produced many important critiques of the overall CalSim-II approach. These included, among others:

> **The peer review did not specifically address the manner in which CalSim-II represents the environmental regulations and objectives established for the Central Valley water system.**

- Its extreme reliance on the output of other models as CalSim-II model input without adequate consideration of the assumptions implicit in these other models;
- Its rudimentary representation of important groundwater resources in the system; and,
- Its failure to undergo a classic calibration and validation analysis prior to its deployment in numerous water resources decision-making processes.

The peer review did not specifically address, however, the manner in which CalSim-II represents the environmental regulations and objectives established for the Central Valley water system.

This report describes an effort specifically designed to consider the issue of environmental performance and compliance with environmental requirements. In implementing this review, which involved detailed examination of CalSim-II code and model output, two questions were posed:

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[1] Close, A., W.M. Hanemann, J.W. Labadie. D.P. Loucks (chair), J.R. Lund, D.C. McKinney, and J.R. Stedinger. 2003. **A Strategic Review of CALSIM II and its Use for Water Planning, Management, and Operations in Central California.** Association of Bay Area Governments. Oakland, California.

1. Does the representation of environmental regulations and objectives in CalSim-II represent full compliance with current legal requirements?
2. Can CalSim-II be used to plan for water management alternatives associated with improve environmental outcomes and habitat restoration?

In formulating a response to these questions, the effort specifically sought to define a series of actions that could be taken to make CalSim-II responsive to these "full environmental compliance" and "environmentally preferred" standards. For this assessment, compliance was defined as representing all current and pertinent environmental laws and regulations in a manner consistent with how they are actually implemented. Environmentally preferred includes environmental restoration measures that might emerge from on-going regulatory processes, different interpretations of existing regulations, or measures that go beyond current regulatory requirements but are appropriate for long-term planning studies. In particular, we are interested in how CalSim-II could be used to evaluate management strategies that contribute to the restoration of aquatic ecosystems and not the perpetuation of the declining situation under the status quo.

This environmental review was funded by Water for California and managed by the Natural Heritage Institute. Owing to its in-house technical capacity using CalSim-II, NHI was responsible for identifying and describing environmentally pertinent details of the CalSim-II model, including details of both the CalSim-II model logic and results from the Common Assumptions Baseline model runs. Through a series of meetings and one-on-one interactions, NHI collaborated with analysts from Wolf and Associates, the Bay Institute, and Environmental Defense to evaluate and measure these details against the full environmental compliance and environmentally preferred standards. NHI then used the results of this collaboration to formulate two distinct work plans that would (i) assure full environmental compliance and (ii) reflect desired and/or anticipated regulatory changes with regard to environmental services in the Central Valley system. The motivation for this effort is that the implementation of these work plans will increase the level of acceptance afforded the CalSim-II model by the environmental stakeholder community. Absent this acceptance, the usefulness of CalSim-II in multi-stakeholder planning and environmental review processes may be unnecessarily compromised.

Scope of the Review Process

In defining the scope of the CalSim-II environmental review, several general observations about the model proved instructive:

- The CalSim-II model treats environmental considerations as constraints on system operations rather than as objectives to be included in the water allocation optimization routine.
- While some environmental constraints are defined for a particular river/reservoir system, others, in particular the accounting logic associated with implementation of section 3406(b)(2) of the Central Valley Project Improvement Act, have system-wide implications.
- There are numerous local and system-wide sets of environmental constraints in CalSim-II, including regulations for 12 Central Valley rivers and creeks, in the Sacramento-San Joaquin Delta and associated with (b)(2) accounting.

The first observation is important because while treating environmental objectives as "constraints" assures that they will be satisfied, it also requires that certain *a priori* assumptions be made in defining the constraints. Some of these assumptions currently apply perfect foresight through the use of water year indices. This foresight influences the manner in which risk tolerance is captured in the CalSim-II water allocation logic that does not correspond with actual operational decisions made in pursuit of environmental objectives.

The second observation has implications because the approach taken in integrating different local regulations into a governing system-wide constraint set can be as important as the definition of the local constraints themselves. For example, the model logic that applies local environmental operations against (b)(2) obligations can be as important as the logic governing the definition of a minimum flow for a particular river reach.

The third observation this report reviewed a significant but limited subset of these regulations. Those reviewed were selected based on the experience of a panel of environmental experts. This selection does not imply that characterizations of other regulation in CalSim-II meet the full compliance standard.

The flow of this document turns first towards the role that water year indices play in the characterization of environmental constraints and objectives, with specific reference to the definition of risk tolerance in CalSim-II. The report then examines a set of specific environmental regulations in greater detail, examining the model logic that governs the establishment of environmental constraints on the CalSim-II water allocation logic. The report closes with detailed workplans designed to move CalSim-II towards full environmental compliance and environmentally preferred standards that were applied during this model review. While much technical detail has been included in the discussion of water year indices and specific environmental regulations, an honest attempt was made to limit the technical detail to those items that have a direct bearing on the proposed work plans. We ask for our reader's patience in working through the technical details and promise that the effort will be rewarded through a fuller capacity to evaluate the proposed workplans found in the final section of the report.

Water Year Indices and the Role of Foresight in CalSim-II Risk Tolerance

CalSim-II considers environmental objectives to be constraints on the water allocation optimization routine. While the current treatment of environmental regulations assures that environmental "constraints" are satisfied before any water is allocated to other purposes, *the model decides whether or not environmental flows are to be met in full in advance of all other allocations*. This reduces the many environmental unknowns and creates more manageable resource allocation problems but it also serves to optimize water exports rather than environmental outcomes.

This approach is inconsistent with the manner in which water resource allocations actually evolve between the months of February and May, when inflows are highly uncertain. Further, the formulation of environmental objectives as constraints removes the possibility that the environmental objectives for the system will benefit from the same level of optimization as other beneficial uses and hides the need to consider the real environmental impacts of water management activity, namely the condition of the ecosystem.

The formulation of environmental objectives as constraints removes the possibility that the environmental objectives for the system will benefit from the same level of optimization as other beneficial uses and hides the need to consider the real environmental impacts of water management activity, namely the condition of the ecosystem.

This approach to modeling environmental compliance is problematic in terms of responding to the two questions posed in this model review. These criteria focus on the actions necessary to restore California's aquatic ecosystems in order to comply with environmental law rather than simply meeting delivery targets. It also calls into question the use of CalSim-II as a tool for environmental impact assessment, since it is changes in the environment associated with specific projects and not the satisfaction of arbitrary constraints which is the critical focus of environmental review.

Discerning the contours of this problem involves understanding the source and environmental application of all the water year indices used in CalSim-II. Before examining specific indices, it is worth pointing out that water year indices are read into CalSim-II from look-up tables, and they are invariant for a 12-month period subsequent to the month in which they are updated. The index values themselves are pre-calculated from the historic 1921-1994 data used as input to the model. In other words, water year types are defined with *perfect foresight*. Text Box 1 presents a summary of indices that govern environmental standards in CalSim-II.

The following text describes these indices in greater detail and highlights the ways in which they are used to establish environmental constraints. This text is followed by a description of how these indices influence environmental constraints in the CalSim-II water allocation routine and, thereby, how this impacts the final service throughout the system vis-à-vis the risk tolerance logic applied to non-environmental deliveries. Prior to continuing, however, it is important to point out that this document's focus indices use, rather than on the scientific justification of the indices themselves, is not to be interpreted

as an acceptance of the actual indices. The use of data from the previous year has an inappropriate impact on the values of the individual indices.

D1485 Indices

Five water year indices defined by D1485 standards are used to determine Delta Outflow requirements, as they would have been executed under Decision 1485. In addition, they are used for accounting purposes in assigning 'costs' to the (b)(2) account. Each of the indices is updated during the February time step and remains invariant for the subsequent 12 months.

Text Box 1: Water Year Indices Used to Define Environmental Constraints

- D1485
  - D1485 Index
  - D1485 Subnormal Snowmelt Index
  - D1485 2-year Index
  - D1485 Fish and Wildlife Standards Index
  - D1485 Project Deficiency Index
- DWR Indices
  - 40-30-30 Sacramento Basin Index
  - 60-20-20 San Joaquin Basin Index
  - Feather River Basin Index
- CVP Indices
  - Shasta Index
  - American River D893 Index
- Miscellaneous
  - Trinity River Index
  - 8-River Index

D1485 WATER YEAR TYPE INDEX:

The D1485 index[2] has 5 levels: 1 = Wet, 2 = Above Normal, 3 = Below Normal, 4 = Dry, 5 = Critically Dry. The index is used in the calculation of the 1485 Fish and Wildlife Index.

D1485 SNOWMELT INDEX:

The D1485 Snowmelt index[3] has 2 levels: 1 = Above Normal, 2 = Sub-Normal. The index is used in defining Minimum Required Delta Outflow (MRDO) requirements under the D1485 regulatory simulation.

D1485 2-YEAR INDEX

The D1485 2-year index[4] has 2 levels: 0 = normal D1485 conditions, 1 = post-Critical Water Year conditions. Analysis of the input data reveals that the post-Critical Water Year conditions do not always follow years with a D1485 index value of 5, or Critically Dry. The index is used in the calculation of the D1485 Fish and Wildlife Index.

D1485 FISH & WILDLIFE STANDARDS INDEX

The D1485 Fish & Wildlife Standards Index is based on the current values of the D1485 Index and the D1485 2-year Index. Essentially, when the D1485 2-year Index is 1, post-Critical Water Year conditions, the value of the D1485 Index is increased by one increment corresponding to the next drier condition. The D1485 Fish and Wildlife Index

[2] ...\D1485\Run\Lookup\wytypeD1485.table (this notation refers to the specific CalSim-II files that contain the information discussed in the text)
[3] ...\D1485\Run\Lookup\wytypeSnow.table
[4] ...\D1485\Run\Lookup\wytype2yr.table

is then used to define the Rio Vista minimum flow requirement[5]. Additionally, this index is used to define Minimum Required Delta Outflow (MRDO) requirements under the D1485 regulatory simulation.

D1485 Project Deficiency Index

The D1485 Project Deficiency Index[6] has 2 levels: 0 = no deficiencies, 1 = deficiencies. This index is used in defining Minimum Required Delta Outflow (MRDO) requirements under D1485 flow requirements.

DWR Indices

Two DWR indices, which are defined in February and remain invariant for the subsequent 12 months, are used for setting minimum flow standards for certain rivers as well as Delta outflow standards.

40-30-30 Sacramento Basin Index

The 40-30-30 Sacramento Basin Index[7] has 5 levels: 1 = Wet, 2 = Above Normal, 3 = Below Normal, 4 = Dry, 5 = Critically Dry. The index is used in i.) defining the volume of water in the (b)(2) account, ii.) determining reservations of (b)(2) water to assure that (b)(2) is not entirely depleted in the fall, iii.) changing the salinity standards in the Delta, iv.) changing the Minimum Required Delta Outflow[8], and v.) defining the Rio Vista minimum flow requirement[9].

60-20-20 San Joaquin Basin Index

The 60-20-20 San Joaquin Basin Index[10] has 5 levels: 1 = Wet, 2 = Above Normal, 3 = Below Normal, 4 = Dry, 5 = Critically Dry. The index is used to define minimum flow requirements in certain river reaches. Flow requirements affected by the index include the minimum flows on the Calaveras and Mokelumne River, the San Joaquin ERPP (Ecosystem Restoration Program Plan) flows (May 1-10), as well as the VAMP (April 15 – May 15) and Vernalis (October) requirements, which can be relaxed when conditions are dry.

CVP Indices

The Shasta and American River CVP indices included in CalSim-II are used to determine minimum flow requirements in the Sacramento basin. Values of the CVP indices are updated in March and remain invariant over the subsequent 12 months.

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[6] ...\D1485\Run\Lookup\wytypeDefic.table
[7] ...\Run\Lookup\wytypes.table
[8] ...\common\Delta\Mrdo\Delta-outflow\delta-outflow.wresl
[9] ...\common\Delta\Riovista\riovista.wresl
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SHASTA INDEX (CVP)

The Shasta Index[11] has 4 levels, where a value of 4 is considered Critically Dry. The Shasta index is used to determine minimum flows in Clear Creek and at Red Bluff. When the index equals 4, reductions are made to Refuge Contracts North of the Delta[12].

AMERICAN RIVER D893 INDEX

The American River D893 Index[13] has 2 levels and is used to determine the H Street minimum flow requirements, specified in Decision 893. Requirements at H Street vary by month and are specified in a lookup table[14].

Miscellaneous Indices

Several stand-alone indices that are applied at various places in the system are also used to set environmental constraints.

THE TRINITY RIVER INDEX

The Trinity River Index[15] has 5 levels: 1 = Wet, 2 = Above Normal, 3 = Below Normal, 4 = Dry, 5 = Critically Dry. The Trinity Index is set in April and held constant throughout the year. The Trinity River Index is used to determine minimum flow requirements in the Trinity River. Requirements for the Trinity River vary by both month and are specified in a lookup table[16].

EIGHT RIVER INDEX

The Eight River Index[17] is a table of pre-calculated, invariant numbers derived from analysis of historic data. The Eight River Index is used to define Minimum Required Delta Outflow requirements in January.

The most fundamental observation that can be made based on the information presented in the preceding section is that some environmental standards are set based on perfect foresight about the values assigned to water year indices. This assumption can influence the operational logic of the model. Understanding how this operational logic ignores the risk of operating for dynamic environmental objectives is critical to the application of the full environmental compliance and environmentally preferred standards to the performance of CalSim-II.

The Influence of Water Year Indices on the Definition of Risk Tolerance

The most fundamental observation that can be made based on the information presented in the preceding section is that some environmental standards are set based on perfect

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[15] ...\Run\Lookup\wytypes.table
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[17] ...\Run\Lookup\eightriver.table

foresight about the values assigned to water year indices. This assumption can influence the operational logic of the model. Understanding how this operational logic ignores the risk of operating for dynamic environmental objectives is critical to the application of the full environmental compliance and environmentally preferred standards to the performance of CalSim-II. The easiest way to explain how risk management for the environment could be improved is to illustrate how CalSim-II approaches risk management in promising water deliveries.

CalSim-II relies upon a series of curves to manage uncertainty in promising water to users throughout California: generally these curves define risk tolerance. Specifically, these curves illustrate the ability to promise water deliveries given a specific water year outlook (not to be confused with the water year indices). While the treatment of risk tolerance varies somewhat between the CVP and SWP systems, the procedure used in the CVP portion of the model is illustrative. CVP water allocations (i.e. monthly varying delivery promises) are set by the Water Supply Index-Demand Index (WSI-DI) curve, Figure 1. Here the promised CVP delivery (embedded in the Demand Index) is determined by the specific water year outlook (determined by the Water Supply Index). Unlike the water year indices, the water supply index (WSI) is calculated every month as the sum of storages *plus* an imperfect forecast of inflows.

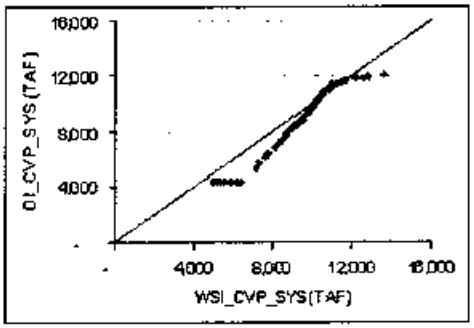

Figure 1 – WSI-DI Curve for CVP water allocations

Three interesting observations emerge from Figure 1. First, at very high levels of water supply the corresponding demand flattens out. This is associated with the fact that the system demand is not unlimited and that above a certain water supply threshold, all water demand can be satisfied. Second, at very low water supply values, the demand index is also flat. This corresponds to the hard water demand that will exist even in the driest conditions. Finally, intermediate to these two tails, an increase in water supply translates into an increase in the water demand that can be satisfied. At high water supply levels all of the available supply is allocated to meet demand. As the water supply decreases, however, the WSI-DI curve falls below the 1:1 line suggesting that a smaller percentage of the available supply is made available to meet demand. This is the first part of the CalSim-II's risk tolerance definition: when conditions are dry, caution is taken in promising water to meet demand.

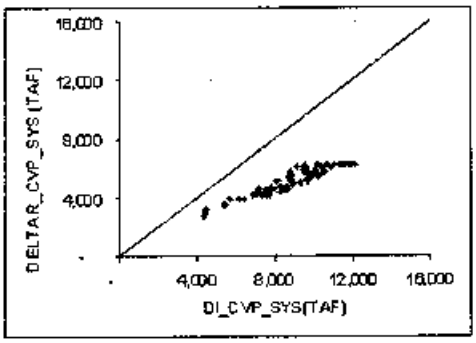

Figure 2 – Del-Car Curve for CVP water allocations

The Demand Index, however, is the sum of both delivery and carry-over storage demands. A second step in determining the CVP water allocations in CalSim-II involves partitioning of the available water between CVP contractors and storage in CVP reservoirs. The Delivery-Carry Over (DelCar) Curve, Figure 2, accomplishes this. Note that the curve has a high-end tail similar to the WSI-DI curve, which occurs during full contract deliveries to CVP contractors. As the Demand Index decreases in value, a smaller percentage of the available supply is committed to carry over storage relative to the amount that is delivered to meet current water demand. This is the second component of the risk tolerance included in CalSim-II: as conditions get dry, a larger percentage of available supply is used to meet current demands in the hope that future inflows will restore reservoir storage levels. Notice that at a DI value of roughly 4000 TAF, the nearly all of the water available to meet demand, is being delivered to satisfy current needs.

At this point the reader is probably wondering how the shape of these two curves are established. In other words, how is the acceptable level of risk tolerance defined? The answer is that some trial and error takes place to train the WSI-DI and DelCar curves. Before describing this process, however, a short digression is made to respond to the other question likely on the mind of the reader, namely how are forecasts of reservoir inflows used to define WSI?

CalSim-II makes a series of annual water allocation decisions starting in February of each water year. At that moment, based on an analysis of historic conditions that has been conducted outside of CalSim-II, knowledge of the snow pack above the major reservoirs in a given water year is added to the level of precipitation that, over the ensuing 5 months, has been exceeded 99% of the time in the historic record. A simple regression model developed by the Department of Water Resources is then used to translate the existing snow pack and anticipated rainfall into a predicted level of reservoir inflow that is added to the water already in reservoir storage to yield the Water Supply Index shown on the x-axis of Figure 1. Unless there is an unusually large snow pack in place in February, by anticipating such a low level of precipitation, CalSim-II likely forces the value of WSI to fall relatively low on the x-axis of Figure 1. This translates to a relatively modest commitment to satisfy demand that may results in delivery cuts being set by the allocation logic relative to full contract amounts.

The forecasted reservoir inflow is updated during the March, April and May time-steps using the process described above and historic information on the available snow pack and future precipitation at the levels exceeded 90, 75 and 50% of the time, respectively. These updated reservoir inflow forecasts are combined with the simulated level of reservoir storage to define a new value of WSI that is translated to a commitment to deliver water to satisfy current needs. If this leads to a higher level of delivery, then the cut logic invoked during an earlier time step is relaxed. By June, the value of WSI is considered fixed for the current water year.

One final comment is warranted. If the situation worsens as the process is implemented, for example if warm late winter temperatures deplete the snow-pack, forcing releases from reservoirs to comply with flood control obligations, and the actual precipitation is less than that which was forecast, the allocation logic will not reduce the quantity of deliveries defined during a previous time step, and end-of-year carry-over storage will be reduced as a consequence.

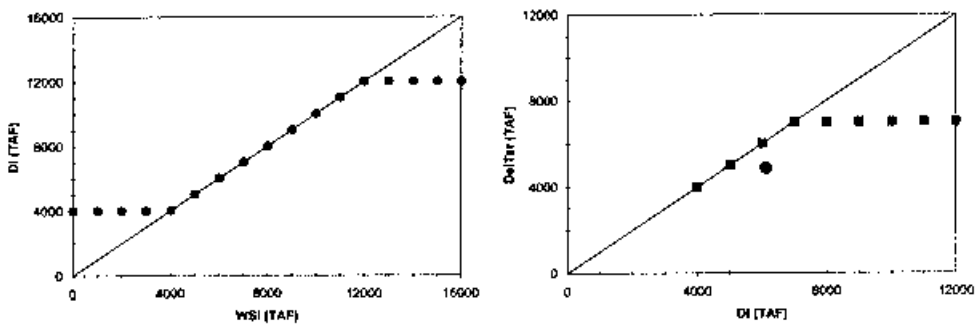

Figure 3 – Stylized Representation of Maximum Risk Tolerance

As alluded to above, the WSI values arrived at by implementing this iterative process drive the use of the WSI-DI and DelCar Curves shown in Figures 1 and 2. This brings us back to the question of how the shape of the curves is established. The most aggressive possible operational strategy for providing water to users would be to use all of the available supply to meet current needs. This posture is stylized in Figure 3. As in Figures 1 and 2, the tails at the upper and lower values of WSI and DI have been preserved. At intermediate values, however, all available water is used to satisfy the current need for water deliveries as both the WSI-DI and DelCar Curves follow the 1:1 line. This posture, however, presumes that the system is completely unconstrained in its ability to deliver all available water to demands throughout the Central Valley. Four primary constraints act to prevent this aggressive delivery policy.

1. There is uncertainly associated with the forecast value of WSI;
2. The actual physical capacity of installed infrastructure can limit water deliveries;
3. Carry-over storage is critical to meeting water management objectives in future years; and most importantly from the perspective of this review
4. Constraints related to environmental regulations may limit the delivery of water.

These factors could, therefore, conspire to create a situation whereby the actual deliveries to demands throughout the system would be somewhat less than promised (e.g. the circle on the right-hand graph in Figure 3). This failure to deliver promised water is in essence a "broken promise" to contractors, and was deemed unacceptable to the CalSim-II development team. To avoid this situation, the WSI-DI and DelCar Curves were developed to add prudence to the interpretation of how much water is available, and what fraction thereof is deliverable. Obviously, this is a departure from the most aggressive posture (Figure 3) toward the aversion to promise deliveries that ultimately cannot be made as expressed in Figure 1 and Figure 2.

The most fundamental observation from the review of CalSim-II is that the environmental constraints used to train the WSI-DI and DelCar Curves were based on a number of *a priori* assumptions, including perfect foresight associated with the use of water year indices. Our thoughts on the implications of the assumptions are found in the section discussing proposed work plans to meet the Full Compliance and Environmentally Preferred standards. The overall implications of perfect foresight should also be kept in mind as the reader reviews the details of specific environmental standards found in the following section.

Detailed Analysis of Specific Environmental Regulations

As mentioned earlier, CalSim-II includes representations of numerous environmental standards, more in fact than could be examined given the time and resources available to this review process. Starting from the input matrix that is typically used to describe a CalSim-II model formulation, the following table identifies the portions of CalSim-II Common Assumptions Baseline code that we evaluated as part of this study.

Regulatory Standards
Trinity River
Upper Sacramento River
Feather River
American River
Stanislaus River
Sacramento-San Joaquin Delta
Operations Criteria
Subsystem
• Stanislaus River
System Wide
• CVP Water Allocation
• CVPIA 3406(b)(2)

Before launching into the specific details of particular environmental regulations, it is probably worthwhile to present the logic of model cycles and model steps used in CalSim-II. CalSim-II is, in fact, run iteratively (recall the discussion of cycles) with different assumptions being applied to the model during each iteration. The pattern of iteration is shown in Figure 4.

Beginning in October, the first month of a water year, CalSim-II executes a series of model cycles that iteratively add objectives to the system. The first cycle involves meeting delivery requirements on the east side of the San Joaquin Valley. During the second cycle, base operations are checked against certain water quality standards for the San Joaquin River, and additional releases are made if required and possible. In the third cycle, it attempts to satisfy pulse flow requirements for the San Joaquin River and its tributaries. The fourth cycle checks that the San Joaquin River water quality standards are still being met after the addition of the pulse flows, and it makes adjustments if needed and feasible. The fifth and final cycle for the San Joaquin River applies specific objectives such as the Vernalis Adaptive Management Plan and the Stanislaus River dissolved oxygen standards.

At the end of the fifth cycle, the CalSim-II representation of San Joaquin River inflows to the Delta is established for the month. The next two cycles add in all of the model logic related to the water management in the Sacramento River, the Delta and the Export zone. Once releases under all seven cycles are calculated, CalSim-II moves on to the next month of the water year. The set of seven calculation cycles continues until calculations for the final month of the water year, September, are completed.

At this point, it is important to introduce and define a new term: "steps." Steps represent the final, monthly set of releases for a 12 month water year. CalSim-II utilizes several

steps before finalizing monthly releases made throughout each water year. Each step in CalSim-II corresponds with a particular water resource policy benchmark. CalSim-II is required to calculate releases under multiple policy regimes because policies (such as the (b)(2)) manage and account for water deliveries relative to releases that *might* have been made under prior regulatory environments.

The first CalSim-II step, referred to as D-1485, calculates releases that would have been made under the regulatory environment pre-dating the enactment of the Water Quality Control Plan. Older regulatory environments can present opportunities to deliver water that are greater than they would be under present conditions. These 'false' opportunities are not reported as the actual availability of water, but are instead used to measure changes in delivery as a result of changes in regulatory policy.

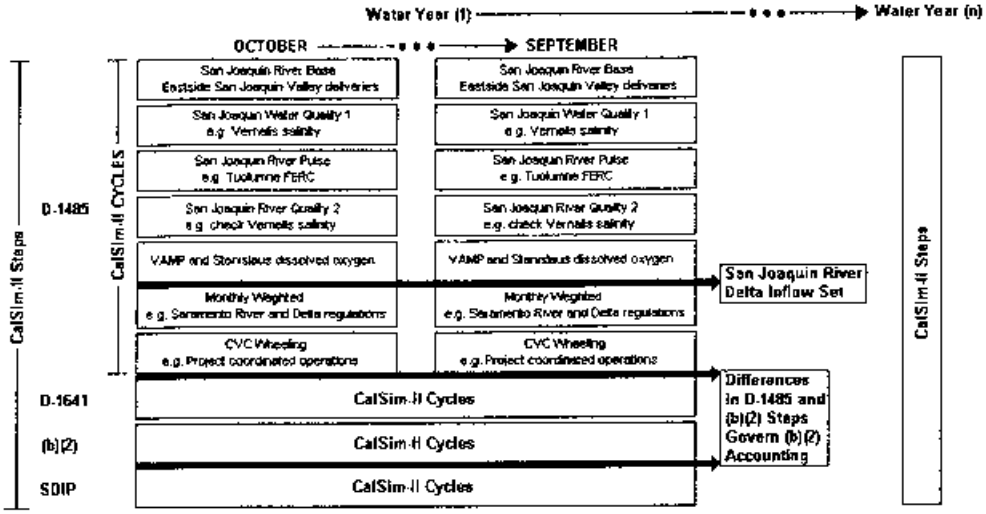

Figure 4 – CalSim-II model cycles and steps

The second CalSim-II model step assumes that the Water Quality Control Plan is in place, which increasingly constrains the ability to deliver water. Any reduction is accounted for as the cost of implementing the Water Quality Control Plan. The next model step assumes that the (b)(2) provisions of the CVPIA require between 600 and 800 TAF of CVP water to be rededicated to environmental objectives. During this step, in completing the seven cycles for the 12 months of a water year, CalSim-II invokes a series of actions that can provide the extra water relative to that which was used for environmental purposes in the D-1485 step. This implies that additional environmental water uses associated with implementation of the Water Quality Control Plan are counted against the (b)(2) obligation. Once all of the environmental considerations are addressed, CalSim-II completes a final step to resolve management considerations related to the adoption of the South Delta Improvement Plan. Only after all cycles and steps are completed for a given 12 month water year does CalSim-II move on to calculations for the following water year, beginning with October.

The implications of this pattern of iteration employed by CalSim-II should be kept in mind as the reader reviews details of specific environmental regulations presented below.

CVPIA 3406(b)(2) Accounting

Section 3406(b)(2) of the Central Valley Project Improvement Act states that the Central Valley Project will:

> "dedicate and manage annually 800,000 acre-feet of Central Valley Project yield for the primary purpose of implementing the fish, wildlife, and habitat restoration purposes and measures authorized by this title; to assist the State of California in its efforts to protect the waters of the San Francisco Bay/Sacramento-San Joaquin Delta Estuary; and to help to meet such obligations as may be legally imposed upon the Central Valley Project under State or Federal law following the date of enactment of this title, including but not limited to additional obligations under the Federal Endangered Species Act."

This prescription has, since the passage of CVPIA, been the focus of protracted legal and administrative wrangling. The key questions relate to whether or not the 800 TAF dedication to restoration efforts applies in all years and what actions taken in the operation of the CVP system can be considered as acceptable contributions to the (b)(2) account. In May 2003 the Department of the Interior issued what are considered to be the current rules for interpreting Congressional intent. These are summarized below.

A. Accounting Period
The accounting period for determining the use of the annual (b)(2) allocation will be October 1 through September 30.

B. Accounting Methodology
The appropriate accounting methodology for the dedication and management of (b)(2) water is based upon how and where the water is used. Interior's new methodology for accounting for (b)(2) will involve only two measurement methods, or metrics, to account for how the water is managed under (b)(2). The two metrics used will be upstream releases and Delta exports.

1. Upstream Actions – October 1 through September 30

   a. Accounting Methodology
   Upstream fishery actions from October 1 through September 30 will be accounted as the increase in releases from upstream reservoirs with the fishery actions, compared to releases from the reservoirs[18] that would have resulted from baseline CVP operations[19] during the same period without the fishery actions. The calculation of the increase in release with the fishery measures will be based on daily changes in releases resulting from the (b)(2) measures prescribed by the Fish & Wildlife Service (Service), accumulated over the period.

   b. Upstream Releases may Flow through Delta
   If specified by Interior, based on a written assessment of biological benefits to the fishery from the Service, steps will be pursued under California law to allow upstream releases to flow through the Delta. Upstream releases specified to flow through the Delta would be accounted for solely under this provision, and not as Delta actions.

2. Delta Actions that affect Exports – October 1 through September 30

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[18] Releases from Trinity Reservoir for Trinity River flows pursuant to 3406(b)(23) of the CVPIA are excluded from the accounting under this provision. Releases to the river from Whiskeytown Dam, Keswick Dam, Nimbus Dam and Goodwin Dam comprise the basis for this metric.

[19] Interior is currently using the pre-1992 base CVP operations with D-1485 water quality obligations as the baseline CVP operation. The pre-1992 baseline includes the 1992 Winter Run Chinook Salmon Biological Opinion and other licenses and permits as construed at that time.

a. Accounting Methodology

Delta actions that affect exports will be accounted throughout the water year as the reduction in exports from the Delta resulting from the prescribed fishery actions. Any export reductions prescribed by the Service below the baseline operation will be accounted as (b)(2) actions. The calculation of decrease in Delta exports with the fishery measures will be based on daily changes in Delta exports with the fishery measures will be based on daily changes in Delta exports resulting from the (b)(2) measures prescribed by the Service, accumulated over the period.

b. Limitation on Delta Actions – February 1 through August 31

During the period February 1 through August 31 (the "low point" for CVP storage in San Luis Reservoir), (b)(2) prescriptions for export reductions will be limited to a maximum of 640,000 acre-feet (80 percent of 800,000 acre-feet of (b)(2) water). This maximum amount will be reduced up-to 80 percent when the overall water available to (b)(2) is reduced in Dry and Critical water years.

The Department of the Interior decision continues to state, "… for the purposes of classifying the water year type and developing operation plans, the 90-percent exceedence hydrology will be used."

Translating these legislative and administrative guidelines into CalSim-II model logic is a complicated endeavor. Two observations regarding the manner in which this was accomplished are particularly relevant to this environmental review. First, in spite of the suggestion that some notion of uncertainty be applied to the determination of water year type, CalSim-II employs perfect foresight in determining the amount of water that must be dedicated to (b)(2) actions. Based on the 40-30-30 Sacramento River Index which is read into CalSim-II during the February time step, CalSim-II sets the size of the (b)(2) account for the entire water year at the levels shown in Table 1.

> CalSim-II employs perfect foresight in determining the amount of water that must be dedicated to (b)(2) actions.

Table 1 – Annual (b)(2) requirements based on Sacramento River water year type

Sacramento River Water Year Type	(b)(2) Requirement (TAF)
Wet	800
Above Normal	800
Normal	800
Below Normal	700
Critically Dry	600

The second pertinent observation is that CalSim-II employs the simulated operation of the system following the D-1485 step (see Figure 4, above) as a baseline against which additional ecosystem restoration actions called for under (b)(2) are measured. This implies that all CVP actions related to implementation of the D-1641 Water Quality Control Plan are considered to be acceptable charges against the (b)(2) account. This belies the fact that water quality actions can have little direct ecosystem benefit. These

observations will be taken up again the discussion of the full environmental compliance and environmentally preferred work plans. For the moment, the remainder of this sections deals with actions taken during the CalSim-II (b)(2) step in order to satisfy (b)(2) obligations.

> This implies that all CVP actions related to implementation of the D-1641 Water Quality Control Plan are considered to be acceptable charges against the (b)(2) account. This belies the fact that water quality actions can have little direct ecosystem benefit.

As stated in the Department of the Interior guideline, either increases in releases from CVP regulating reservoirs (Whiskeytown, Keswick, Nimbus, and Goodwin), or decreases in CVP Delta exports relative to a pre-1992 baseline, can be considered to constitute contributions against the (b)(2) obligations. These are described in the standing interpretations, and in CalSim-II, as the Release Metric and the Export Metric. In operation, both are calculated daily. In CalSim-II, the release metric is calculated as the **increase** in total end-of-month releases from CVP reservoirs finalized in the (b)(2) step, relative to the simulated end-of-month releases from CVP reservoirs in the D-1485 step. In the event that the (b)(2) step reduces outflows from CVP reservoirs (relative to D-1485), the (b)(2) account is not credited.

Similarly, the Release Metric is defined as the reduction in end-of-month CVP Delta exports for the (b)(2) step, relative to the D-1485 step. Increased exports (relative to D-1485) are not credited to the (b)(2) account, and the total possible charge to the Release Metric is limited to a fraction of the (b)(2) account. Generally, one of three actions results in a charge to the Release Metric. 1) Changes to the Delta salinity standards between the (b)(2) and D-1485 steps could result in a reduction to exports, 2) exports could be curtailed in the months in April and May as part of the Vernalis Adaptive Management Plan (VAMP), or 3) exports could be curtailed in June in order to bring the (b)(2) account into compliance with the target ecosystem budget.

Table 2 - April and May VAMP export cuts for (b)(2)

Flow at Vernalis (cfs)	CVP Delta Export Restrictions		
	April 1 – 14	April 15 – May 15	May 16 – 31
< 5700	17.5% Inflow	750 CFS	3000 CFS
5700 – 8600	17.5% Inflow	Alternate 750 CFS and 1500 CFS	3000 CFS
> 8600	17.5% Inflow	25% Flow at Vernalis	3000 CFS

VAMP export restrictions from April 1 to May 31 are always activated for (b)(2) accounting purposes (Table 2). The (b)(2) export restrictions apply to CVP Delta exports from Tracy and Banks. During the first non-pulse period, April 1-14, total Delta exports from Tracy and Banks are limited to 35% of Delta inflow[20], with the CVP and the SWP

[20] The sum of Sacramento River flows at Hood, Yolo Bypass return flows, San Joaquin River flows at Vernalis, Mokelumne River, Calaveras River, and Marsh Creek inflows to the Delta.

each being apportioned 50% of the water. During the April 15 – May 15 pulse period, CVP Delta exports are restricted to 750 cfs if the VAMP requirement is less than 5700 cfs. If the VAMP requirement is greater than 5700 cfs then CVP delta exports are restricted to either 750 or 1500 cfs, depending upon the previous year's VAMP restriction. This export restriction alternates between years. Maximum CVP exports are increased to 25% of flows at Vernalis if they are greater than 8600 cfs. In the second non-pulse period, May 16-30, CVP Delta exports are restricted to 3000 cfs. If extending the pulse period restrictions through the end of May is more than what is needed to satisfy (b)(2) requirements then the pumping restrictions for May 16-31 will be adjusted to a level that brings the CVP into compliance with its (b)(2) obligations.

CVP delta exports in June are always restricted to a maximum of 3000 cfs. If there are remaining (b)(2) costs that are not met by projected WQCP actions then CVP pumping at Tracy and Banks will be curtailed. June CVP delta pumping can be reduced from the 3000 cfs standard, but cannot be reduced below the level of export pumping simulated during May. In addition, pulse period pumping restrictions can be applied for the first 7 days in June and increased to 3000 cfs for the remaining 23 days of the month. If extending the pulse period restriction through the first week of June exceeds the amount needed to satisfy (b)(2) requirements then June pumping restrictions will be adjusted to a level that brings the CVP into compliance with its (b)(2) obligations.

Keep in mind as you read the following sections and work plans that modeling (b)(2) correctly requires both correct representation and correct comparison. Representation is more or less an issue of capturing the regulated policy, e.g. there are 800 TAF for disbursement. Comparison is an issue of appropriately capturing the accounting baseline, and charging specific accounts at the appropriate point within the myriad of cycles and steps being performed to calculate operations.

A comment: CalSim-II contains an impressive bulk of code devoted specifically to the accounting of (b)(2) water. Literally, over half of the current model could be eliminated if the (b)(2) account were not being tracked. This demonstrates the power and flexibility of CalSim-II's environment for adopting incremental accounting regulations such as (b)(2). Conversely, this makes an enormous statement about the magnitude of effort required to track "packets" of water running through the Central Valley, as if water releases were so many parcels being ferried through a factory on conveyor belts. While tracking incremental quantities may be appropriate for contracted deliveries, it is an ill-conceived starting point for protecting environmental services because they depend more upon the 'state' of the system than upon raw quantities. There is a need to move away from incremental policies such as the (b)(2) toward dynamic water management decision making that is driven by targeted responses to current environmental conditions. This suggestion also speaks directly to a primary issue that stakeholders have with models: transparency. Quite simply, less complex accounting procedures require less code. Less code makes water resource

There is a need to move away from incremental policies such as the (b)(2) toward dynamic water management decision making that is driven by targeted responses to current environmental conditions.

models simpler to explain, to track and to understand: thereby making the dialogue over alternatives more accessible to stakeholders. While the authors harbor no great illusions about California's water resource system and regulatory environment getting simplified, we suggest it as a practical rule of thumb for future policy directions.

Trinity Operations

CalSim-II models releases of water from storage in the Trinity System along two arcs, marked in Figure 5 as C100 (Trinity River) and D100 (Clear Creek Tunnel). The logic dividing flows between the Trinity River releases and diversion towards the Sacramento River are relatively straightforward.

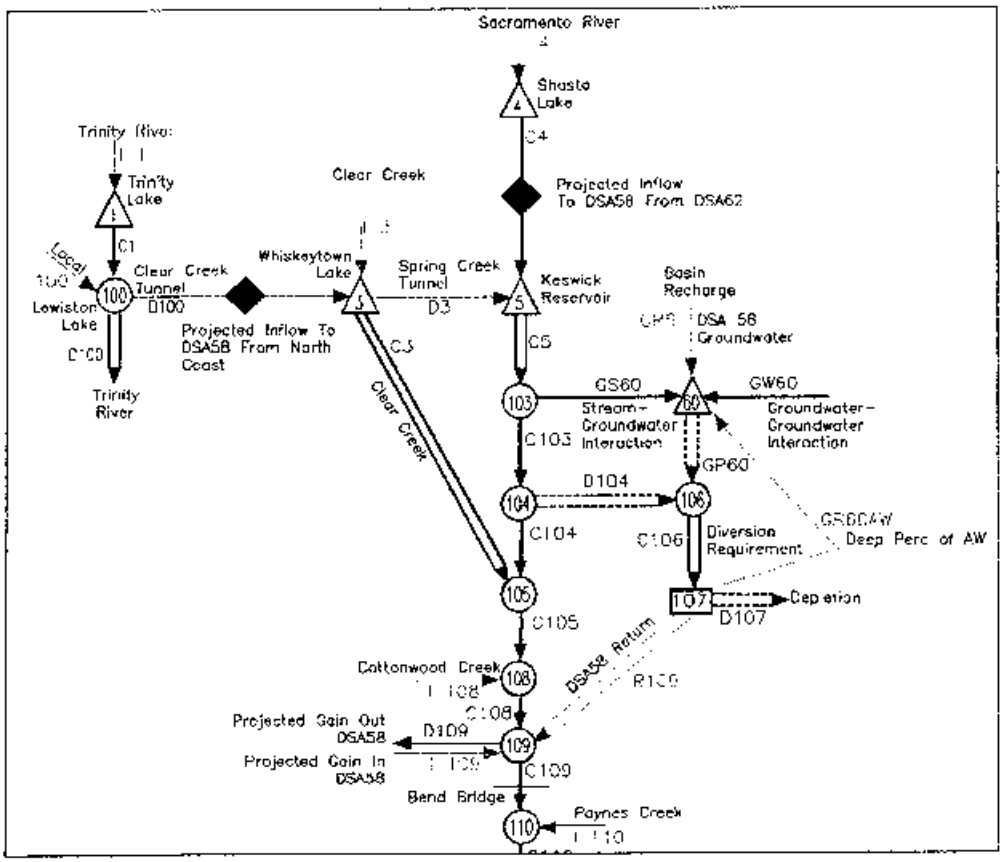

Figure 5 – Trinity Storage and Releases, represented on the CalSim-II schematic as reservoir 1 and arcs C100 (Trinity River) and D100 (Clear Creek Tunnel)

The Trinity River water year index determines the release schedule for the Trinity River[21]. The release schedule is referenced from a lookup table (Table 3), and is the same for each CalSim-II step.[22] Notice that there are significant differences between required releases to the Lower Trinity depending on the water year index, particularly during the late spring and early summer months. This is the kind of difference that has implications for the manner in which risk tolerance is established in CalSim-II, as discussed in the previous section.

[21] …\common\NorthOfDelta\Trinity\Trinitymin.wresl
[22] …\Run\Lookup\Trinitymin.table

Table 3 – Trinity River minimum flow requirements (cfs), set by the Trinity water year index

Month	Trinity River Water Year Index				
	Wet (1)	Above Normal (2)	Below Normal (3)	Dry (4)	Critical (5)
October	373	373	373	373	373
November	300	300	300	300	300
December	300	300	300	300	300
January	300	300	300	300	300
February	300	300	300	300	300
March	300	300	300	300	300
April	427	460	493	540	600
May	4570	4709	4189	2924	1498
June	4626	2526	2120	783	783
July	1102	1102	1102	450	450
August	450	450	450	450	450
September	450	450	450	450	450

Trinity river transfers to the Sacramento River basin are made through the 3300 cfs Spring Creek tunnel into Whiskeytown Reservoir. The transfer goal is set relative to the storage levels in Lake Shasta and in reservoirs on the Trinity River. In both cases, Storage Level 1 corresponds to the lowest storage zone, in which case a reservoir is extremely drawn down. At the highest reservoir storage levels, Level 5 for the Trinity reservoirs and Level 6 at Lake Shasta, reservoirs are so full that they are spilling water. Table 2 shows the assigned relationship between the Trinity to Sacramento transfer targets and the storage levels in the two reservoirs.[23] These transfer values can be exceeded when, for instance, Trinity is spilling and the "excess flows" in the Trinity River are used to augment CVP storages or to meet Delta outflow objectives. This is important because when the Trinity River transfers are increased between the D1485 step and the (b)(2) step, the transfer of this "excess flow" is accounted for as a charge against the (b)(2) obligations. As a result the model may be able to avoid clearly beneficial environmental actions called for under (b)(2) during the spring months.

This is important because when the Trinity River transfers are increased between the D1485 step and the (b)(2) step, the transfer of this "excess flow" is accounted for as a charge against the (b)(2) obligations. As a result the model may be able to avoid clearly beneficial environmental actions called for under (b)(2) during the spring months.

[23] ...\Run\Lookup\trinity_import.table

Table 4 – Trinity River Diversions through Clear Creek Tunnel (cfs)

Trinity Level	Shasta Level	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	1	0	0	0	0	0	0	0	0	250	250	250	250
1	2	0	0	0	0	0	0	0	0	250	250	250	250
1	3	0	0	0	0	0	0	0	0	250	250	250	250
1	4	0	0	0	0	0	0	0	0	250	250	250	250
1	5	0	0	0	0	0	0	0	0	250	250	250	250
1	6	0	0	0	0	0	0	0	0	0	0	0	0
2	1	250	100	100	100	100	100	100	100	250	1500	1500	1000
2	2	250	100	100	100	100	100	100	100	250	1500	1500	1000
2	3	250	100	100	100	100	100	100	100	250	1250	1250	1000
2	4	250	100	100	100	100	100	100	100	250	1000	1000	750
2	5	250	0	0	0	0	0	0	0	250	750	750	500
2	6	0	0	0	0	0	0	0	0	0	0	0	0
3	1	1250	750	250	250	250	250	250	250	1250	2500	2500	1750
3	2	1250	750	250	250	250	250	250	250	1250	2500	2500	1750
3	3	1000	500	250	250	250	250	250	250	1000	2250	2250	1500
3	4	750	500	250	250	250	250	250	250	750	1750	1750	1500
3	5	750	250	100	100	100	100	100	100	750	1500	1500	1000
3	6	0	0	0	0	0	0	0	0	0	0	0	0
4	1	1750	1000	250	250	250	250	250	250	1750	3250	3250	3250
4	2	1750	1000	250	250	250	250	250	250	1750	3250	3250	3250
4	3	1500	750	250	250	250	250	250	250	1500	2500	2500	2500
4	4	1250	500	250	250	250	250	250	250	1250	2000	2000	2000
4	5	750	500	100	100	100	100	100	100	750	1500	1500	1500
4	6	0	0	0	0	0	0	0	0	0	0	0	0
5	1	3250	3000	1000	250	250	250	250	250	3000	3250	3250	3250
5	2	3250	3000	1000	250	250	250	250	250	3000	3250	3250	3250
5	3	2750	2500	750	250	250	250	250	250	2500	3000	3000	3000
5	4	2500	1750	500	250	250	250	250	250	1750	2750	2750	2750
5	5	1500	1500	500	100	100	100	100	100	1500	1500	1500	1500
5	6	0	0	0	0	0	0	0	0	0	0	0	0

Shasta/Keswick Downstream Releases

CalSim-II models releases of water from storage in the Shasta/Keswick along two arcs, marked in the Figure 6 as C4 (Shasta releases) and C5 (Keswick releases). Model logic associated with these arcs account for minimum flow requirements in the Sacramento River.

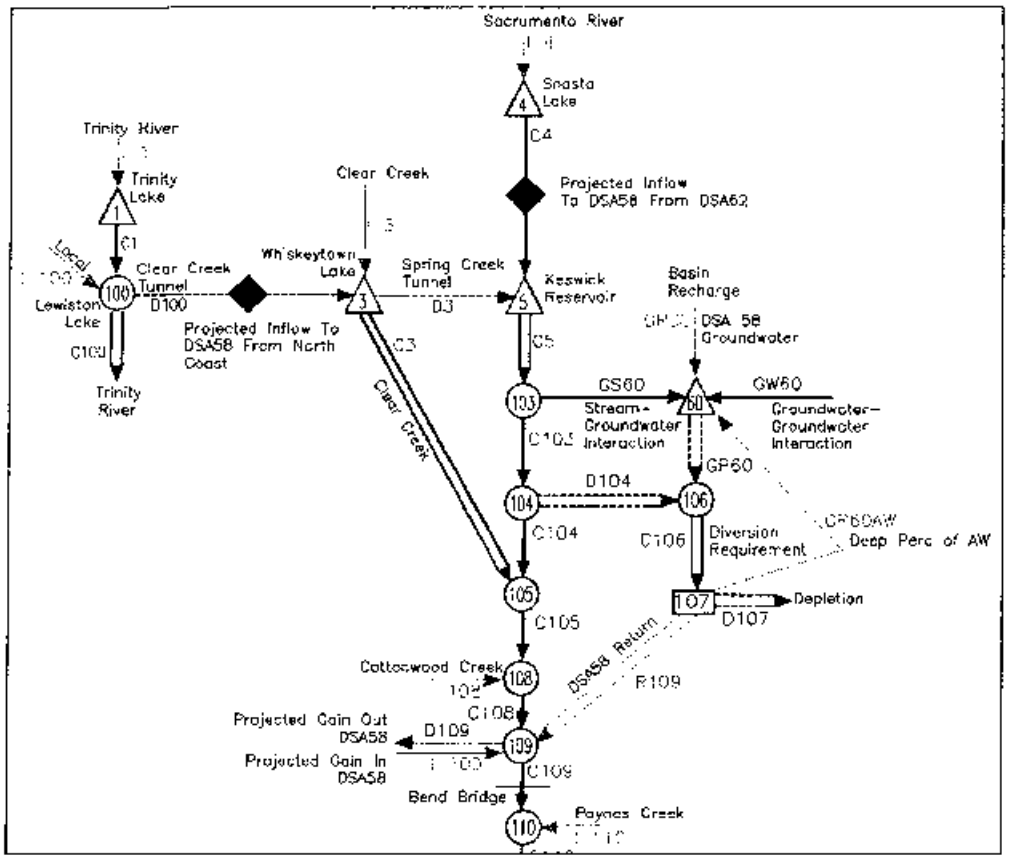

Figure 6 - Shasta/Keswick Storage and Releases, represented on the CalSim-II schematic through reservoirs 4 and 5 and arcs C4 and C5

The minimum flow requirement has three parts: (1) the Keswick Temperature Requirement, (2) the Stability Flow Requirement, and (3) the AFRP requirement. The Keswick Temperature Requirement is based upon the storage in Lake Shasta at the end of September. These values are taken from a look-up table[24] and applied continuously throughout the year (Table 5). Temperature requirements are applied in all CalSim-II model steps (D1485 through SDIP).

[24] … \Run\Lookup\keswick_tempcntrl.table

The Stability Flow requirement exists to maintain the stability of the downstream levee systems against sloughing that could occur as a result of rapid, dramatic declines in river levels. If outflows from Shasta fall below a threshold, the current month's reservoir release must be maintained at a certain fraction of the previous month's reservoir release to sustain the structural integrity of the earthen riverbanks. The thresholds and fractions associated with this regulation are given in Table 6[25], and the Stability Requirement is only invoked when the previous month's flows are below the stability threshold. Stability requirements are applied only in the (b)(2) step and can result in charges to the (b)(2) account.

Table 5 – Temperature Releases from Shasta Dam (in cfs) corresponding storages

Storage in Shasta (TAF)	Oct	Nov	through	Mar	Apr	May	Jun	Jul	Aug	Sep
0	3,250				3,250	3,250	3,250	3,250	3,250	3,250
2,000	3,250				3,250	3,250	3,250	3,250	3,250	3,250
2,500	3,250				4,000	5,500	5,500	6,000	6,000	4,500
3,250	4,000		3,250		4,250	6,350	7,000	8,500	8,000	5,500
3,750	4,500				4,500	7,000	8,000	9,500	9,000	6,000
4,500	5,000				5,000	8,000	9,000	11,000	10,000	6,500
>4,500	5,000				5,000	8,000	9,000	11,000	10,000	6,500

Table 6 – Stability of Flow requirements for Shasta Dam, coded to represent FWS management of b2 under the May 2003 Department of Interior (b)(2) Decision

	Previous month's release from Shasta-Keswick (cfs)	Required Fraction of previous month's flow to maintain in current month
November	<6,000	65%
December	<4,500	90%
January	<4,500	80%
February	<4,500	80%
March	<4,500	80%

The Anadromous Fish Restoration Plan (AFRP) flow requirements for the Sacramento River below Shasta and Keswick are based on the previous month's Shasta storage or, between March and September, upon storage plus a forecast of inflows[26] (Table 7). These forecasts are based on 99%, 90%, 75%, and 50% exceedence probabilities for February, March, April, and May through September, respectively. AFRP requirements are applied in the (b)(2) step and can result in charges to the (b)(2) account.

Between the temperature, stability, and AFRP requirements the maximum requirement is not always applied. In conditions when large (b)(2) allocations have been made by the end of January, the AFRP requirement will be relaxed, and the next highest of the temperature and stability flow requirements will be applied[27]. Table 8 explains this

[25] ...\(b)(2)\Run\Lookup\SacStability.table
[26] ...\(b)(2)\Run\Lookup\sacramento_runoff_forecast.table
[27] ...\(b)(2)\Run\(b)(2)Actions\(b)(2)Action1.wresl

decision logic. The bottom two rows in Table 8 refer to "Expected AFRP Costs in January." This value is calculated as the sum of previous costs plus full AFRP flow requirements in January from Whiskeytown, Shasta/Keswick and Folsom/Nimbus. As indicated in the table, requirements that result in (b)(2) costs in excess of 200 TAF by the end of January will be relaxed. This relaxation is performed to conserve (b)(2) water through the spring.

Table 7 – AFRP flow requirements are specified (in cfs) by the storage in Shasta (TAF). Values marked "" were not tabulated, and are determined through linear interpolation**

Shasta Storage (TAF)	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
0	3250	3250	3250	3250	3250	3250	3250	3250	3250	3250	3250	4500
1500	**	**	**	3500	**	**	**	3250	3250	3250	3250	**
1750	**	**	**	**	3500	**	**	3250	3250	3250	3250	**
2000	**	**	**	3750	**	3500	3500	3250	3250	3250	3250	6000
2200	3500	3500	3500	**	3750	**	**	3250	3250	3250	3250	6000
2300	3750	3750	3750	**	**	**	**	3250	3250	3250	3250	6000
2400	4000	4000	4000	**	**	3750	3750	3250	3250	3250	3250	6000
2500	4250	4250	4250	**	**	**	**	3250	3250	3250	3250	6000
2600	4500	4500	4500	4000	**	**	**	3250	3250	3250	3250	6000
2700	4750	4750	4750	4250	4000	**	**	3250	3250	3250	3250	6000
2800	5000	5000	5000	4500	4250	**	**	3250	3250	3250	3250	6000
2900	5250	5250	5250	4750	4500	**	**	3250	3250	3250	3250	6000
3000	5500	5500	5500	5000	4750	4000	**	3250	3250	3250	3250	6000
3050	5500	5500	5500	**	**	4250	**	3250	3250	3250	3250	6000
3100	5500	5500	5500	5250	5000	4500	**	3250	3250	3250	3250	6000
3150	5500	5500	5500	**	**	4750	**	3250	3250	3250	3250	6000
3200	5500	5500	5500	5500	5250	5000	4000	3250	3250	3250	3250	6000
3300	5500	5500	5500	5500	5500	5250	4250	3250	3250	3250	3250	6000
3400	5500	5500	5500	5500	5500	5500	4500	3250	3250	3250	3250	6000
3500	5500	5500	5500	5500	5500	5500	4750	3250	3250	3250	3250	6000
3600	5500	5500	5500	5500	5500	5500	5000	3250	3250	3250	3250	6000
3700	5500	5500	5500	5500	5500	5500	5250	3250	3250	3250	3250	6000
3800	5500	5500	5500	5500	5500	5500	5500	3250	3250	3250	3250	6000
4552	5500	5500	5500	5500	5500	5500	5500	3250	3250	3250	3250	6000

Table 8 – Minimum flow selection matrix, assuming that the Stability Requirement is evoked

Month	(b)(2) Account Condition	Shasta Minimum Flow Requirement
Dec	(b)(2) costs through Nov. >50 TAF	Max between (Temp, Stability), but not above the AFRP requirement
Dec	(b)(2) costs through Nov. <50 TAF	Max (Temp, Stability, AFRP)
Jan	(b)(2) costs through Dec. >150 TAF	Max between (Temp, Stability), but not above the AFRP requirement
Jan	(b)(2) costs through Dec. <150 TAF	Max (Temp, Stability, AFRP)
Jan	(b)(2) costs through Dec. + Expected AFRP Cost in Jan >200 TAF	Max between (Temp, Stability), but not above the AFRP requirement
Jan	(b)(2) costs through Dec. + Expected AFRP Cost in Jan <200 TAF	Max (Temp, Stability, AFRP)

Shasta's storage is treated as part of the larger, integrated Central Valley Project. As such, releases can be made from Shasta in order to fulfill obligations (e.g. delta outflow, instream requirements, export, wheeling, or COA) that are shared among CVP reservoirs. Generally, CalSim-II attempts to keep Shasta, Folsom, and Trinity reservoirs in the same storage zones, thereby balancing the obligations for water with both the capacity of the three dams, and probably the likelihood of being refilled. This balancing, however, is relevant to the 1993 Winter Run Biological Opinion that includes a provision for minimum carryover storage in Lake Shasta of 1.9 MAF at the minimum end-of-September. In CalSim-II, this storage goal is not made explicitly and the fulfillment of the requirement must be judged through an analysis of the output generated at the end of a particular simulation. For the common assumptions baseline, the time-series of simulated September End-of-Month storage is shown in Figure 7.

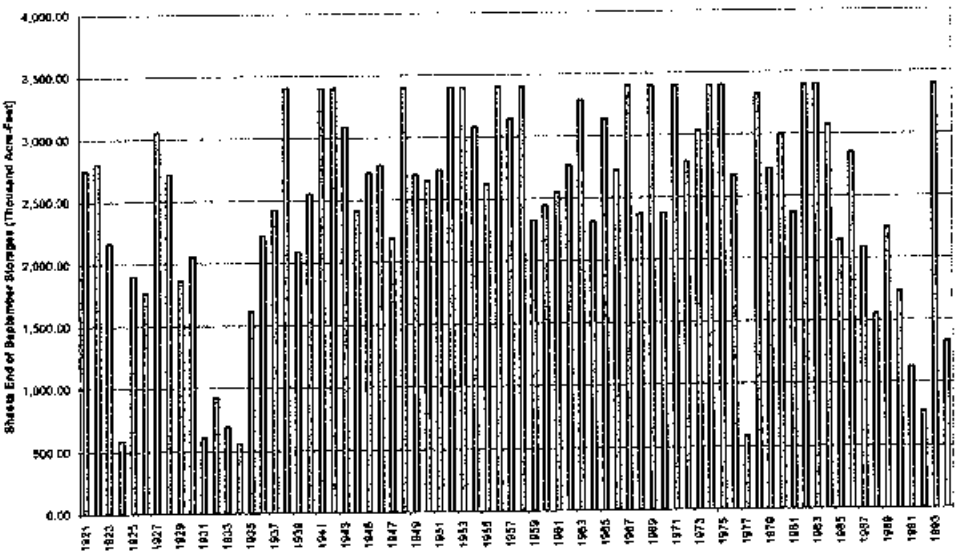

Figure 7 – End of September storages resulting from Baseline (CA_2020D09D_FutureSDIP_2_1) CalSim-II operations

Oroville/Thermalito Downstream Releases

CalSim-II models the combined releases from Oroville and Thermalito along one arc, marked in the Figure 8 as C203. There are three minimum flow requirements imposed on Feather River releases, all of which are expressed in one sub-arc, C203_MIF[28].

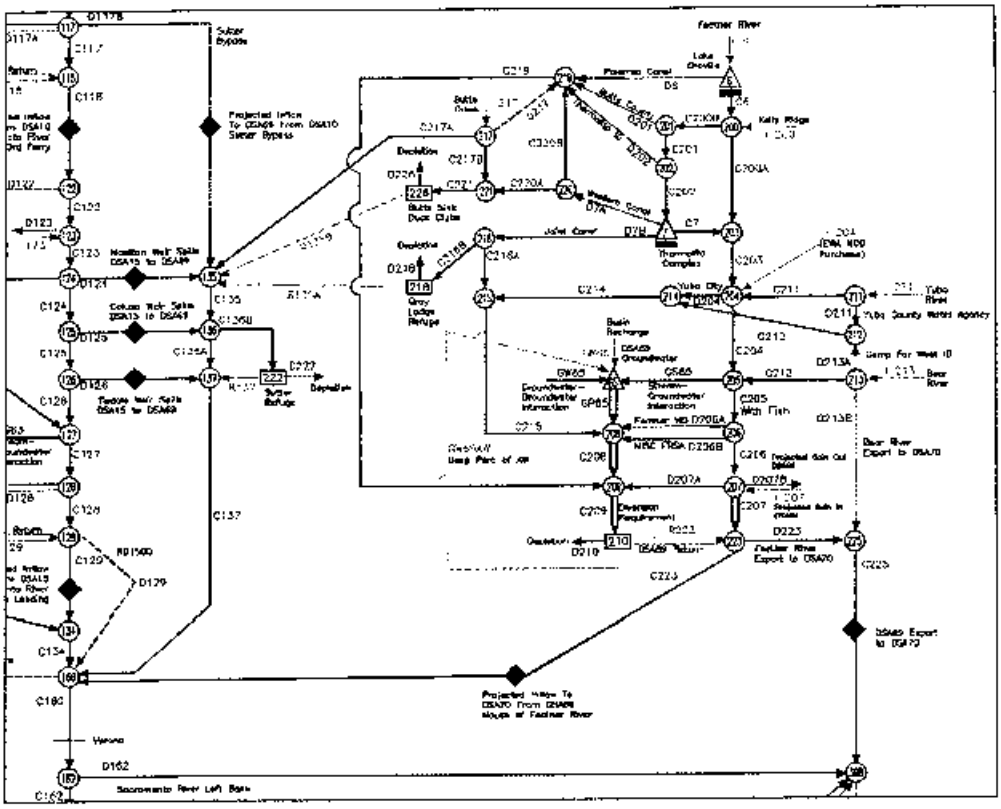

Figure 8 - Oroville/Thermalito Storage and Releases, represented on the CalSim-II schematic through reservoirs 6 and 7 and arc C6, C7 and (as a combined flow) C203

If flows on the Feather River exceed an average of 4,000 cfs in October, or 2,500 cfs in November, then the following months (through March) must maintain at least the previous months flow, minus 500 cfs. The only exception to this requirement is in the event of an October or November flood (expressed as Lake Oroville storage in zone 6), in which case no flow requirements are triggered for the following months. CalSim-II attempts to avoid this minimum flow requirement by placing a heavy penalty on flows above 4,000 cfs in October and 2,500 cfs in November.

There is also a minimum instream flow requirement set for the reach of the Feather River between Thermalito and Verona that varies between 750-1,850 cfs depending on the month and the water year.

[28] ...\common\NorthOfDelta\Feather\feather_special.wresl

Finally, between April and September, Lake Oroville is called upon to provide 2,800 cfs in addition to diversions along the Feather River, shown in the CalSim-II schematic as D7A, D7B, D206A, and D206B. Yuba River inflows count toward this requirement. Additionally, the instream flow requirement here is constrained such that the sum of the diversions and instream flow requirement will not exceed the monthly inflow to Oroville Dam. The implication is that maintaining reservoir levels is a higher priority than the satisfaction of downstream environmental flows.

Folsom/Nimbus Downstream Releases

CalSim-II models releases from Folsom and Nimbus along two arcs, marked in Figure 9 as C8 and C9. The Nimbus release arc is divided into three sub-arcs, to assist in accounting for release requirements.

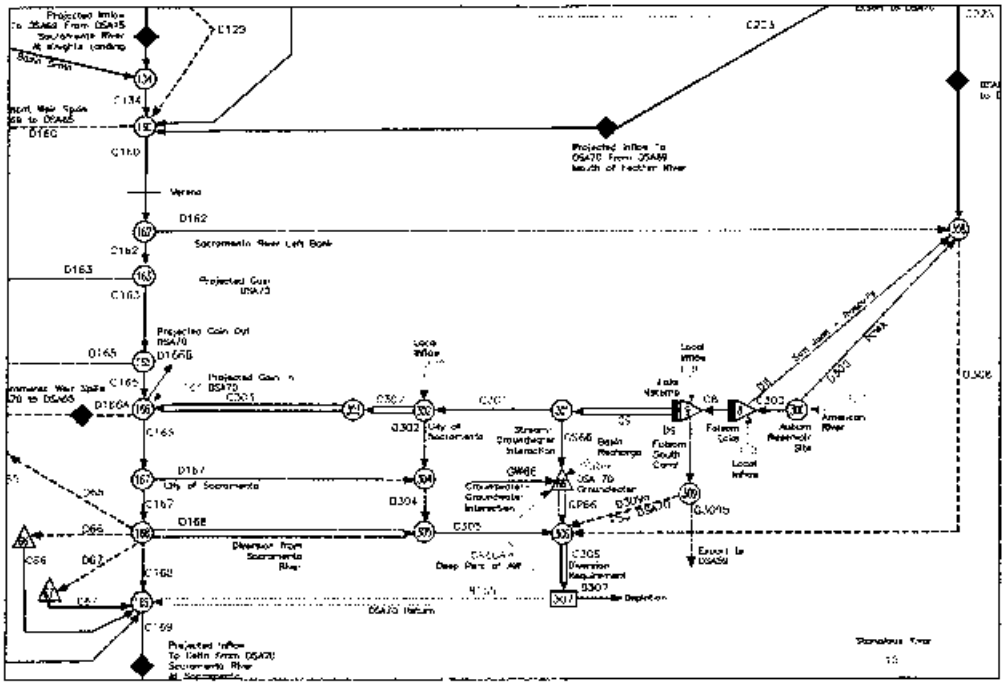

Figure 9 - Folsom/Nimbus Storage and Releases, represented on the CalSim-II schematic through reservoirs 8 and 9 and arc C8 and C9

The historic flow requirement at Folsom is based upon "modified D-1400" requirements, as they were modeled within the PROSIM environment[29]. This flow requirement calls for distinct downstream release actions depending on whether the Folsom storage is above or below 200 TAF. If storage is above 200 TAF, CalSim-II bases minimum flow requirements on either storage in Folsom (October – February) or storage plus a forecast of inflows until the end of the water yeas in September (March – September)[30]. Forecasts are based on 99%, 90%, 75% and 50% exceedence probabilities for February, March, April and May through September, respectively. Minimum flows resulting from the application of this logic are given in Table 9.

[29] …\common\NorthOfDelta\American\NimbusHistMinQ.wresl
[30] …\D1485\Run\Lookup\american_runoff_forecast.table

Table 9 - Historic flow requirements through Nimbus Dam, given storages (Oct. – Apr.) or storages plus forecasted inflows (Mar. – Sep.). Values marked "" were not tabulated, and are determined through linear interpolation.**

Folsom Storage (TAF)	Flow Requirement from Nimbus (cfs)											
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
0	0	0	0	0	0	0	0	0	0	0	0	0
80	**	**	**	**	**	188	188	188	188	188	188	281
100	500	500	500	500	500	250	250	250	250	250	250	375
200	600	500	500	500	500	**	**	**	**	**	500	375
300	**	500	500	500	500	500	500	500	500	500	500	**
400	750	500	500	500	500	500	500	500	500	500	500	**
500	**	**	**	**	**	500	500	500	500	500	500	**
550	**	**	**	**	**	**	**	500	500	500	500	**
575	**	1375	**	**	**	**	**	**	**	500	500	**
600	1250	**	**	**	**	**	**	**	**	500	500	**
635	**	**	1000	1000	**	**	**	**	**	**	**	**
650	**	**	**	**	**	**	**	**	**	**	**	500
685	**	**	**	**	1000	**	**	**	**	**	**	**
700	**	3000	**	**	**	**	**	**	**	**	**	**
760	**	3000	3000	3000	**	**	**	**	**	**	**	**
770	**	**	**	**	**	**	**	**	**	**	**	1000
772	**	3000	3000	3000	3000	**	**	**	**	**	**	**
800	2650	3000	3000	3000	3000	**	**	**	**	**	**	**
840	**	3000	3000	3000	3000	**	**	**	**		2000	**
960	**	3000	3000	3000	3000	**	**	**	**	2000	**	**
975	3000	3000	3000	3000	3000	**	**	**	**	**	**	**
1000	3000	3000	3000	3000	3000	750	750	**	**	**	2500	2500
1080	3000	3000	3000	3000	3000	**	**	**	2000	**	**	2500
1150	3000	3000	3000	3000	3000	**	**	**	**	2500	**	2500
1200	3000	3000	3000	3000	3000	**	**	2000	**	**	**	2500
1300	3000	3000	3000	3000	3000	**	**	**	2500	**	3000	2500
1450	3000	3000	3000	3000	3000	**	**	2500	**	**	3000	2500
1500	3000	3000	3000	3000	3000	**	1750	**	**	**	3000	2500
1600	3000	3000	3000	3000	3000	**	**	**	**	3000	3000	2500
1750	3000	3000	3000	3000	3000	1500	**	**	**	3000	3000	2500
1900	3000	3000	3000	3000	3000	**	**	**	3000	3000	3000	2500
2250	3000	3000	3000	3000	3000	**	3000	**	3000	3000	3000	2500
2300	3000	3000	3000	3000	3000	**	3000	3000	3000	3000	3000	2500
2500	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	2500
>2500	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	2500

Alternatively, when Folsom storages are below 200 TAF, CalSim-II defaults to the pre-CVPIA "18 MAR 1953 D-893 American River at H Street" baseflow requirement. This requirement varies by month, and is defined based on the value of the American River D893 Index. The resulting H-Street requirement is given in Table 10.

Table 10 - H-Street flow requirements for American River under the D1485 Step

Month	"H" Street Flow Requirement (cfs)	
	D-893 Water Year Type 1	*D-893 Water Year Type 2*
Oct	500	375
Nov	500	375
Dec	500	500
Jan	250	250
Feb	250	250
Mar	250	250
Apr	250	188
May	250	188
Jun	250	188
Jul	250	188
Aug	250	188
Sep	375	281

In addition to these historic flow schedules, Stability and AFRP flow requirements are set during the (b)(2) step of CalSim-II's runs. The Stability Flow requirement exists to maintain stable levee systems in the case of low-flow months. If outflows from Folsom fall below a threshold, defined in Table 11[31], then the current month's outflow must maintain a certain fraction of the previous month's outflow to sustain the structural integrity of the earthen riverbanks. Invocation of the stability requirements result in charges against the (b)(2) account.

Table 11 - Stability Flow requirements for Folsom Dam, coded to represent FWS management of b2 under the May 2003 Department of Interior (b)(2) Decision

	Previous month's release from Folsom-Nimbus (cfs)	Required Fraction to maintain in current month
November	<3,000	80%
December	<3,000	90%
January	<3,000	75%
February	<3,000	75%
March	<3,000	75%

The AFRP flow requirements, shown above in Table 12[32], are chosen based on storages in Folsom reservoir (October -- April) or Folsom storage plus an inflow forecast (March – September). Forecasts for the American River change between February and May based on 99%, 90%, 75%, 50% exceedence probabilities for February, March, April and May through September, respectively.[33]

[31] ...\(b)(2)\Run\Lookup\AmerStability.table
[32] ...\(b)(2)\Run\Lookup\AFRP_AMER.table
[33] ...\(b)(2)\Run\Lookup\american_runoff_forecast.table

Table 12 – AFRP Flow Requirements for the American River as a function of Folsom storage or, between March and September, storage plus inflow forecasts through September. Values marked "" were not tabulated, and are determined through linear interpolation.**

Folsom Storages (TAF)	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
0	0	0	0	0	0	0	0	0	0	0	0	0
105	**	**	**	250	250	250	250	250	250	250	250	375
125	500	500	500	**	**	**	**	**	**	**	**	**
200	**	**	**	750	750	**	**	**	**	**	**	**
250	1000	1000	1000	**	**	**	**	**	**	**	**	**
300	1500	1500	1500	**	**	**	**	**	**	**	**	500
350	1750	1750		1500	1500	**	**	**	**	**	**	1000
400	**	**	1750	**	**	**	**	**	**	**	**	1250
450	**	**	**	1750	1750	**	**	**	**	**	**	**
500	**	**	**	**	**	**	**	**	**	**	500	**
575	**	2000	2000	2000	2000	**	**	**	**	**	**	**
600	**	2000	2000	2000	2000	**	**	500	500	500	1000	1750
650	1750	2000	2000	2000	2000	**	**	**	**	**	**	1750
700	2000	2000	2000	2000	2000	500	500	**	**	**	**	1750
725	2000	2000	2000	2000	2000	**	**	**	**	750	**	1750
750	2000	2000	2000	2000	2000	**	**	750	750	**	**	1750
775	2000	2000	2000	2000	2000	**	**	**	1000	1250	**	1750
800	2000	2000	2000	2000	2000	**	**	1250	1250	1500	**	1750
900	2000	2000	2000	2000	2000	750	750	1750	1500	**	1750	1750
950	2000	2000	2000	2000	2000	**	**	**	1750	**	1750	1750
967	2000	2000	2000	2000	2000	**	1000	**	1750	**	1750	1750
1000	2000	2000	2000	2000	2000	**	1250	**	1750	1750	1750	1750
1075	2000	2000	2000	2000	2000	**	1500	**	1750	1750	1750	1750
1150	2000	2000	2000	2000	2000	**	1750	**	1750	1750	1750	1750
1250	2000	2000	2000	2000	2000	1000	**	2000	1750	1750	1750	1750
1400	2000	2000	2000	2000	2000	**	**	**	2750	1750	1750	1750
1450	2000	2000	2000	2000	2000	**	**	3000	**	1750	1750	1750
1500	2000	2000	2000	2000	2000	**	**	3000	3000	1750	1750	1750
1750	2000	2000	2000	2000	2000	1500	**	3000	3000	1750	1750	1750
1800	2000	2000	2000	2000	2000	**	1750	3000	3000	1750	1750	1750
2050	2000	2000	2000	2000	2000	**	2750	3000	3000	1750	1750	1750
2100	2000	2000	2000	2000	2000	**	3000	3000	3000	1750	1750	1750
2500	2000	2000	2000	2000	2000	3000	3000	3000	3000	1750	1750	1750
>2500	2000	2000	2000	2000	2000	3000	3000	3000	3000	1750	1750	1750

Between the Historic, Stability, and AFRP requirements, the maximum requirement is not always applied. This results from the desire to conserve (b)(2) water for spring releases. In conditions when large (b)(2) allocations have been (or might be) made by the end of January, the AFRP requirement will be relaxed, and the next highest flow

requirement (between Historic and Stability) will be applied.[34] Table 13 explains this decision process.

Table 13 - Minimum Flow selection matrix, given that the stability requirement is invoked

Month	(b)(2) Account Condition	Folsom Minimum Flow Requirement
Dec	(b)(2) costs through Nov. >50 TAF	Max between (H St., Stability), but not above the AFRP requirement
Dec	(b)(2) costs through Nov. <50 TAF	Max (H St., Stability, AFRP)
Jan	(b)(2) costs through Dec. >150 TAF	Max between (H St., Stability), but not above the AFRP requirement
Jan	(b)(2) costs through Dec. <150 TAF	Max (H St., Stability, AFRP)
Jan	(b)(2) costs through Dec. + Expected AFRP Cost in Jan >200 TAF	Max between (H St., Stability), but not above the AFRP requirement
Jan	(b)(2) costs through Dec. + Expected AFRP Cost in Jan <200 TAF	Max (H St., Stability, AFRP)

The bottom two rows in Table 13 refer to "Expected AFRP Costs in January." This value is calculated as the sum of previous costs plus full AFRP flow requirements in January from Whiskeytown, Shasta/Keswick and Folsom/Nimbus. As indicated in the table, requirements that result in (b)(2) costs in excess of 200 TAF by the end of January will be relaxed. This relaxation is performed to conserve (b)(2) water through the spring.

[34] ...\(b)(2)\Run\(b)(2)Actions\(b)(2)Action1.wresl

New Melones/Goodwin Downstream Releases

CalSim-II models regulatory requirements for the Stanislaus River along three arcs, marked in Figure 10 as C10 (outflow from New Melones Reservoir), C16 (releases from Goodwin Dam), and C527 (a regulatory point upstream of Ripon). All releases from New Melones made for water quality and environmental purposes are routed through Goodwin Dam, and are unavailable for irrigation withdrawals.

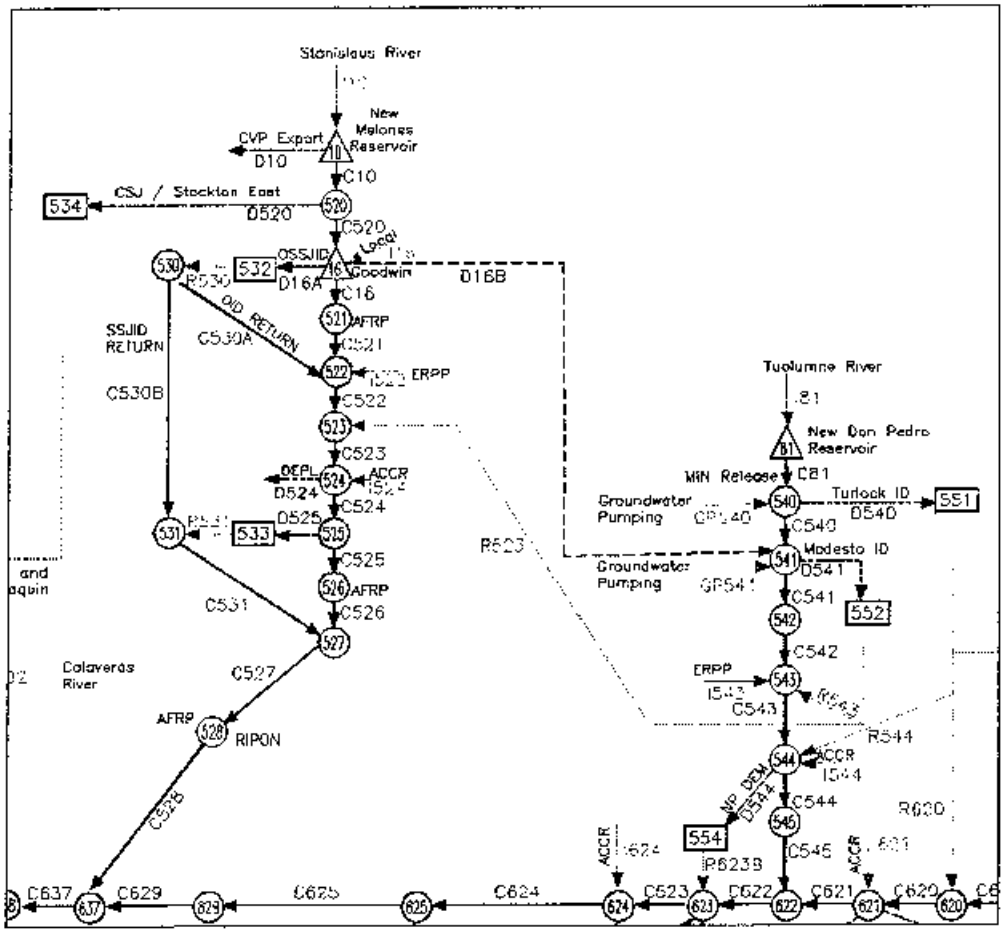

Figure 10 - CalSim-II schematic for the Stanislaus and Tuolumne Rivers

There are four general requirements governing minimum flows in the Stanislaus River below Goodwin Dam: dissolved oxygen standards, salinity standards, minimum flows and pulse flows for fish and wildlife in the Stanislaus River, and the Vernalis Adaptive Management Plan (VAMP) pulses.

Dissolved oxygen requirements for the Stanislaus River are defined below both New Melones and Goodwin[35]. As CalSim-II in its present form is incapable of simulating changes in dissolved oxygen concentrations, a surrogate flow prescription is given to represent the D.O. requirements. The flow prescription, shown in Table 14, is applied as part of all CalSim-II cycles.

Table 14 – Flow based dissolved oxygen criteria for the Stanislaus River[36]

Month	Requirement (TAF)
June	13.2
July	16.2
August	16.4
December	14.3

The Vernalis salinity requirements for the Stanislaus River are set below Goodwin.[37] If releases from Goodwin are sufficient to meet the standard, storage at New Melones will not be utilized for this purpose; otherwise the requirement will be meet through releases from New Melones. The requirement is based on limiting electrical conductivity (EC) values to not more than 700 and 1000 micromhos/cm for irrigation (April – August) and non-irrigation (September – March) seasons, respectively. CalSim-II approximates the required Stanislaus release by assuming a known salt concentration from several sources of flow in the Lower San Joaquin River system, specifically accretions and returns in the Stanislaus River, main-stem flows of the San Joaquin River before confluence with the Stanislaus River, and the west-side San Joaquin River return flows below the Stanislaus/San Joaquin confluence but upstream of Vernalis. Releases from Goodwin are made such that the aggregate concentration at Vernalis meets water quality standards.

All available water in the Stanislaus may be allocated to satisfy consumptive demands when in fact some portion should have been reserved to meet ecosystem objectives.

Pulse flow requirements for the Stanislaus River are defined as outflow from Goodwin and a point upstream from Ripon (node 525 in Figure 10)[38]. The flow requirement is determined through a three-step calculation. First the six-month New Melones forecast (NMF) is defined as the storage in February plus the sum of inflows through September based on a perfect forecast. Second, following the D1485 CalSim-II cycle, the NMF is used to determine an annual fishery allocation.[39] This allocation is given in Table 15. Finally, the fishery allocation is apportioned between pulse flow and minimum flow schedules, shown in Table 16 and Table 17.

[35] ...\Run\SanJoaquin\Stanislaus\DO.wresl
[36] ...\Run\Lookup\DO.table
[37] ...\common\SanJoaquin\WaterQuality\vernalis_wqmin.wresl
[38] ...\SanJoaquin\Stanislaus\stan_FW_pulse.wresl
[39] ...\Run\Lookup\stan_yr.table

Table 15 – Allocation to fisheries, based on New Melones Forecasts[39]

New Melones Forecast: NMF (TAF)	Fishery Allocation (TAF)
0	98
1,400	98
2,000	125
2,500	345
>3,000	467

Table 16 – Pulse flow requirement for the Stanislaus River, April 15 – May 15 [40]

Fishery Allocation (TAF)	Pulse Requirement (cfs)
0	0
98.9	500
>245.7	1,500

Table 17 – Minimum flow schedule for the Stanislaus River, in relation to Fishery Allocations [41]

	New Melones Forecast (x1,000 acre-feet)							
	0	98.9	155	200.6	256.2	311.5	410.2	466.4
January	-	125	150	250	275	300	350	400
February	-	125	150	250	275	300	350	400
March	-	125	150	250	275	300	350	400
April	-	250	300	300	300	900	1,500	1,500
May	-	250	300	300	1,500	900	1,500	1,500
June	-	-	125	200	200	250	800	825
July	-	-	125	200	200	250	300	625
August	-	-	125	200	200	250	300	525
September	-	-	125	200	200	250	300	400
October	-	110	110	200	250	250	350	350
November	-	200	225	250	275	300	350	400
December	-	200	225	250	275	300	350	400

The 1995 WQCP Vernalis minimum flow requirement is defined as soft constraints on releases from New Melones.[42] Releases from New Melones for Vernalis minimum flows are released through Goodwin, and cannot be diverted for other purposes. The standard is determined by (a) the San Joaquin water year type, (b) the day weighted average X2 requirement at Roe Island, Chipps Island and the Sacramento – San Joaquin River confluence (Table 18), (c) a restriction on flows at Goodwin and Ripon (1500 cfs) and (d) a cap set on the sum of New Melones releases between February and June. The New Melones outflow restriction is based on the New Melones forecast as shown in Table 19. Releases from New Melones are designed to make up any deficit in the Vernalis minimum flow requirement, up to release restrictions at New Melones, Goodwin, and Ripon.

[40] ...\Run\Lookup\stan_pulse.table
[41] ...\Run\Lookup\stan_monfish.table
[42] ...\SanJoaquin\Vernalis\vernalis_min.wresl

Table 18 – Vernalis Requirement, by Water Year and X2 Position

San Joaquin Water Year Type	IF X2 is East of Chipps Island, Vernalis Requirement (cfs)	IF X2 is West of Chipps Island, Vernalis Requirement (cfs)
1	2130	3420
2	2130	3420
3	1420	2280
4	1420	2280
5	710	1140

Table 19 – Annual Release Restriction at New Melones[43]

New Melones Forecast (TAF)	Release Restriction at New Melones (TAF)
0	0
1,400	0
2,000	0
NMF ≥ 2,500	1,000

VAMP are target flows in the San Joaquin River at Vernalis during April and May, the obligation for which is shared by water users on all of the eastside San Joaquin River tributaries and the beneficiaries of the exchange pool at Mendota. In the event that other CalSim-II operations leave a deficit in the VAMP account, a portion of the deficit must be offset by release to the lower Stanislaus below Goodwin Dam. Table 20 identifies the VAMP obligation of the Stanislaus River water users and other VAMP regulated rivers, as a function of the VAMP deficit.

Table 20 – New Melones release requirements (TAF), relative to VAMP deficits

VAMP Deficit (TAF)	**Merced ID: Merced River**	OID: Stanislaus River	**Exchange: Mendota Pool**	**MID/TID: Tuolumne River**
0	0	0	0	0
25	25	0	0	0
35	25	10	0	0
40	25	10	5	0
50	25	10	5	10
61.5	36.5	10	5	10
66.1	36.5	14.6	5	10
68.4	36.5	14.6	7.3	10
73	36.5	14.6	7.3	14.6
81.5	45	14.6	7.3	14.6
84.9	45	18	7.3	14.6
86.6	45	18	9	14.6
90	45	18	9	18
100	55	18	9	18
104	55	22	9	18
106	55	22	11	18
Deficit ≥ 110	55	22	11	22

[43] ...\Run\Lookup\stan_yr.table

CalSim-II sequences the access to storage in New Melones Reservoir to meet these various water quality and environmental flow requirements. The general sequence of access is as follows:

1) In the first CalSim-II model cycle, irrigators access storage and inflows to New Melones and Goodwin, up to their current monthly demand.
2) Throughout the remaining model cycles, inflows to and storage in New Melones and Goodwin are made available for water quality and environmental flow requirements in the Lower Stanislaus River and in the Delta.

This sequencing suggests that water delivery objectives are paramount relative to environmental flow requirements. The implication is that all available water may be allocated to satisfy consumptive demands when in fact some portion of available storage should have been reserved to meet ecosystem objectives.

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Delta Outflow Requirements

CalSim-II represents the basic outflow requirements from the Sacramento-San Joaquin Delta through a demand arc marked as D407 in

Figure 11. Generally, the D407 flow requirement is a composite of the X2 requirement and other Delta outflow standards. This standard is set by evaluating (1) the Minimum Required Delta Outflow (MRDO) in concert with either (2a) the ANN Delta Outflow Requirement or (2b) the G-Model. In the CalSim-II model evaluated for this review, the final Delta outflow requirement is the maximum between MRDO and the ANN.

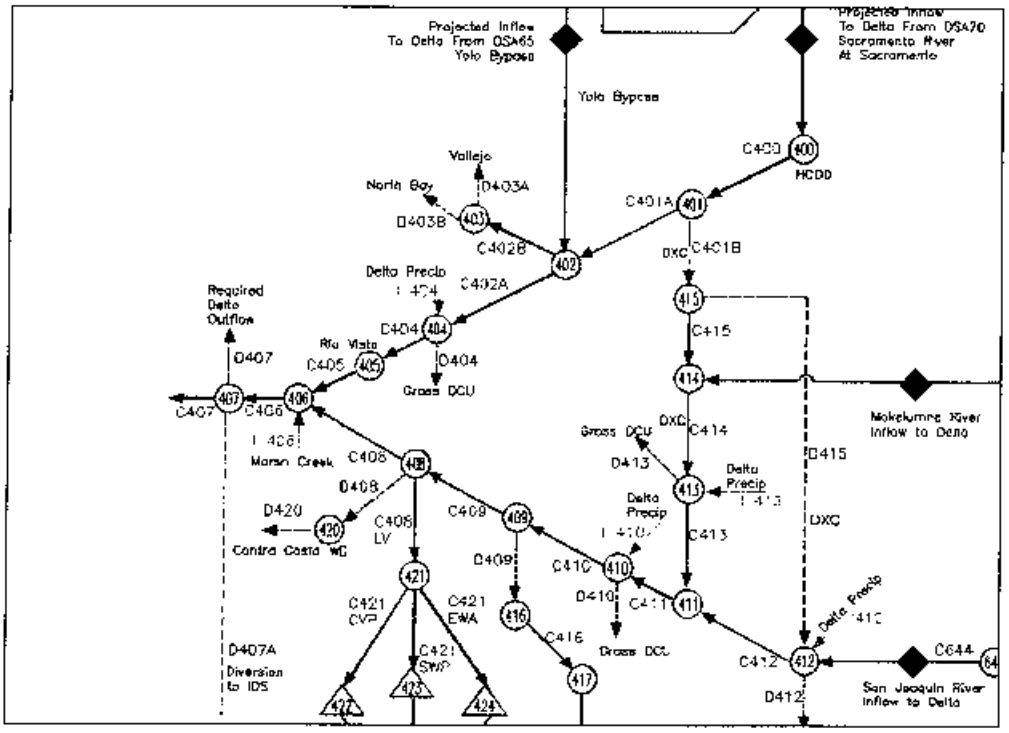

Figure 11 - CalSim-II Representation of the Sacramento-San Joaquin Delta

The Minimum Required Delta Outflow is calculated by evaluating eight separate flow requirements:

i.	Striped Bass Survival/Spawning	(D1485 Flow Requirement, for (b)(2) accounting)
ii.	Suisun Marsh Flow Requirement	(D1485 Flow Requirement, for (b)(2) accounting)
iii.	60-day Suisun Marsh Flow Requirement	(D1485 Flow Requirement, for (b)(2) accounting)
iv.	Flood Envelope Flow Requirement	(D1485 Flow Requirement, for (b)(2) accounting)
v.	X2 at Roe Island/Port Chicago	(D1641, (b)(2), and SDIP Flow Requirement)
vi.	X2 at Chipps Island	(D1641, (b)(2), and SDIP Flow Requirement)
vii.	X2 at the Sacramento-San Joaquin confluence	(D1641, (b)(2), and SDIP Flow Requirement)
viii.	Absolute Minimum Delta Outflow	(D1641, (b)(2), and SDIP Flow Requirement)

These requirements specify (a) the quantity of Delta outflow required to satisfy the requirement, (b) the day the requirement begins, and (c) the day the requirement ends. A composite of these standards is sent by CalSim-II to an external FORTRAN routine that determines the minimum required Delta outflow quantity by arraying the flow requirements across the days in a month, finding the maximum value for each day and averaging these daily maximums to get a monthly value. This procedure is required because CalSim-II runs on a monthly time step. While this is common for water resource planning models, it complicates the simulation of environmental regulation in the Delta which has been designed to manage day to day conditions in the system.

These standards are more related to protecting consumptive uses than creating optimal environmental conditions.

The first four flow requirements are considered by MRDO during the D1485 model cycle (requirements i-iv), but not during subsequent cycles. Increases in reservoir releases or decreases in South of Delta exports that result from changes to these policies during later model cycles are charged to the (b) (2) account.

EWC

Table 21 – Striped Bass survival and spawning Delta outflow schedules

	Delta outflow schedule (cfs) by water year designation						
	W[44] (1)	AN[44] (2)	D[44] (3)	C[44] (4)	Dry-Dry[44]	Wet-Dry[44]	Low Snow[45]
October	4000	4000	4000	4000	3000	2500	2500
November	4500	4500	4500	4500	3500	2500	2500
December	4500	4500	4500	4500	3500	2500	2500
January	2500	2500	2500	2500	2500	2500	2500
February	2500	2500	2500	2500	2500	2500	2500
March	2500	2500	2500	2500	2500	2500	2500
April	6700	6700	6700	6700	6700	6700	6700
May	14000	14000	11400	4300	3300	4300	6500
June	14000	10700	9500	3600	3100	3600	5400
July	10000	7700	6500	3200	2900	3200	3600
August	2500	2500	2500	2500	2500	2500	2500
September	2500	2500	2500	2500	2500	2500	2500

The Striped Bass survival and spawning requirement defines Delta outflows from May 6th – April 14th (excluding April 15th – May 5th). The level of flow required is set by three indices: the D1485 Fish and Wildlife Standards Index [46], the D1485 Subnormal Snowmelt Index [47], and the D1485 Project Deficiency Index[48]. Under normal circumstances, the flow requirement corresponds to the D1485 water year index, shown in the first four columns of Table 21. For sequential dry water years, the requirement

[44] ...\D1485\Run\Lookup\NdoBass.table
[45] ...\D1485\Run\Lookup\NdoBassSnow.table
[46] ...\D1485\Run\Wytypes\wytypes.wresl [NOTE: defined in wresl code as the product of 2 other wytypes]
[47] ...\D1485\Run\Lookup\wytypeSnow.table
[48] ...\D1485\Run\Lookup\wytypeDefic.table

goes to the Dry-Dry schedule. In a dry year following a wet year, the Wet-Dry schedule is invoked. If the water year type is either dry or critical *and* there is a low snowpack forecast (as determined by the D1485 Subnormal Snowmelt Index) the Low Snow schedule in the final column governs the standard.

When the D1485 Project Deficiency Index is triggered (an index value of 1), then the April 1st and 14th schedule can be reduced to 2,500 cfs. Likewise, in a critical D1485 water year the same reduction is allowed.

The Suisun Marsh flow requirement is set based on two water year indices: the D1485 Fish and Wildlife Standards Index [49], the D1485 Subnormal Snowmelt Index [50]. This requirement specifies a default 2,500 cfs Delta outflow flow throughout the year. Criteria for deviating from the default flow requirement are specified in Table 20.

Table 20: Conditional Wet Water Year Suisun Marsh spring flows

D1485 F&W Index	D1485 Subnormal Snowmelt Index	Flow Requirement	Period of Flow Requirement
Wet	Low Snow	10,000 cfs	February - April
Wet	Not Low Snow	10,000 cfs	February - May

The 60-day Suisun Marsh Flow Requirement operates between January and April. This requirement is 2,500 cfs by default. In non-wet (i.e. index $\neq 1$) and non-dry (i.e. index $\neq 4$) water years, the flows are required to be 12,000 cfs for two months between January and April. The months do not have to be sequential, and CalSim-II accounts for the months during this period when the requirement is met.

The three-reservoir Flood Envelope requirement is set by North of Delta storage conditions. In the case that two of the North of Delta projects (Shasta, Folsom, and/or Oroville) have storage in zone 5 (high/spill storage reservoir zone), Delta outflow is required to be 6,600 cfs. Otherwise, the flow requirement defaults to 2,500 cfs.

The Post-D1641 X2 Outflow Requirements (requirements v-viii) are calculated by tracking the 2ppt (X2) bottom isohaline line between the months of February and June. CalSim-II calculates a net monthly flow requirement for three locations (Roe Island/Port Chicago at river mile 39, the Sacramento-San Joaquin Confluence at river mile 50, and Chipps Island at river mile 74).

The first step in setting the X2 requirements is determining where the X2 isohaline line is situated at the beginning of a month or period (BOP). This is determined using the Kimmerer-Monismith equation[51], which references the previous month's North of Delta outflow (NDO) which enters the Delta and the X2 location at the beginning of the previous month (Equation 1). [52]

[49] ...\D1485\Run\Wytypes\wytypes.wresl [NOTE: defined in wresl code as the product of 2 other wytypes]
[50] ...\D1485\Run\Lookup\wytypeSnow.table
[51] It is important to note that this regression equations were develop using data from historic Delta export conditions and that future changes that include dramatic changes in Delta exports may compromise the use of these relationships.
[52] ...\Run\Delta\MRDO\X2\X2req.wresl

Equation 1	$X2_{BOP} = 122.2 + 0.3278 * X2\text{-}Location_{\text{beginning of previous month in kilometers}} - 17.65 * log_{10}(NDO_{\text{previous month in cubic feet per second}})$

If the calculated BOP X2 location is greater than 66.3 km (river mile 41) then the calculation of the Roe Island requirement is invoked. If the BOP X2 position is at, or below the 66.3 km point, then the Roe Island requirement is bypassed. If the Roe Island X2 requirement is triggered, the number of days that the Roe Island X2 constraint is expected to be a controlling Delta outflow requirement is referenced from a lookup table.[53] This number varies by month and by water year. The Delta outflow required to satisfy Roe Island is capped at 29,200 cfs, and is calculated Equation 2.[54]

Equation 2	$Q_{\text{Roe Island Requirement}} = 10 \wedge [(122.2 + 0.3278 * X2\text{-}Location_{\text{beginning of previous month}} - 64) / 17.65]$

If Roe Island is triggered, a further calculation (Equation 3)[55] determines where X2 will be situated at the end of the month as a result of meeting the Roe Island outflow requirement.

Equation 3	$X2\text{-}Location_{\text{Post Roe Island}} = 122.2 + 0.3278 * X2\text{-}Location_{\text{beginning of month}} - 17.65 * Log_{10}(Q_{\text{Roe Island Requirement}})$

In the case that Roe Island standard is invoked, the number of days in which the Chipps Island requirement controls the Delta outflow requirement (same lookup table as the Roe Island standard)[56] is reduced by the number of Roe Island days. The Chipps Island flow requirement is capped at 11,400 cfs, and is calculated using Equation 4[57].

Equation 4	$Q_{\text{Chipps Island Requirement}} = 10 \wedge [(122.2 + 0.3278 * X2\text{-}Location_{\text{Post Roe Island}} - 74) / 17.65]$

Equation 5[58] then determines where X2 will be situated as a result of meeting the Chipps Island outflow requirement.

[53] ...\D1641\Run\Lookup\x2days.table
[54] ...\Run\Delta\MRDO\X2\X2req.wresl
[55] ...\Run\Delta\MRDO\X2\X2req.wresl
[56] ...\D1641\Run\Lookup\x2days.table
[57] ...\Run\Delta\MRDO\X2\X2req.wresl
[58] ...\Run\Delta\MRDO\X2\X2req.wresl

Equation 5	$X2\text{-}Location_{Post\ Chipps\ Island} = 122.2 + 0.3278 * X2\text{-}Location_{beginning\ of\ month} - 17.65 * Log_{10}(Q_{Chipps\ Island\ Requirement})$

The Sacramento-San Joaquin Confluence flow requirement is reduced by the number of days in which either the Roe or Chipps Island requirements are being met (the greater between the two). In the case that Roe Island is not triggered, then the number of days in which the Confluence requirement would be a controlling outflow requirement (same lookup table as the Roe and Chipps Island standards)[59] is reduced by the number of Chipps Island days. The Confluence flow requirement is capped at 7,100 cfs, and is calculated using Equation 6[60].

Equation 6	$Q_{Chipps\ Island\ Requirement} = 10 \wedge [(122.2 + 0.3278 * X2\text{-}Location_{Post\ Roe\ Island} - 74) / 17.65]$

To generate the final X2 requirement, the Roe Island requirement is assumed to begin on day 1 and end after the pre-determined period of time. Any remaining Chipps Island requirements begin on the day after the Roe Island requirement is met. Lastly, any Sacramento-San Joaquin Confluence flow requirements begin on the day after the Chipps Island requirements are met. The Confluence requirement then continues through to the end of the month.

Observation of the results of CalSim-II evaluated during this review reveal that during May and June of the 1924, 1931, 1939, 1976, 1977, 1990, 1991 and 1994 water years, zero X2 days were required, apparently because the projected 40-30-30 Sacramento River Index fell below 8.1 MAF in the month of May. During these situations, a 4,000 cfs minimum flow standard is maintained.

ask Dave

The ANN Delta Outflow Requirement is computed in an external FORTRAN routine (an Artificial Neural Network). Current physically based models, such as the DSM-II, report salinity levels as a function of Delta inflows and exports, and not visa-versa. CalSim-II's ANN was designed to reverse this functional relationship in a procedure that would otherwise be a lengthy iterative process. The ANN bases its decisions on the current month's flow (the only variable), on antecedent flow conditions, and on the current level of salinity at each station. Standards that emerge from the ANN are designed to protect water quality at various points throughout the Delta. These standards are more related to protecting consumptive uses than creating optimal environmental conditions

CalSim-II takes a composite of all of the preceding flow standards in order to arrive at the minimum Delta outflow assigned to arc D407 shown in the schematic found in Figure 11.

[59] ...\D1641\Run\Lookup\x2days.table
[60] ...\Run\Delta\MRDO\X2\X2req.wresl

Full Environmental Compliance CalSim-II Formulation Work Plan

Based on the insights gleaned from this environmental review, it is possible to begin sketching out a work plan for developing a legal compliance formulation of the CalSim-II model. Before launching in to this exercise, however, it is worth forwarding a few general impressions that can place the recommended work plan items in a proper context.

1. Any water resources model, including CalSim-II, can be improved through continued refinement of its underlying assumptions. The following work plan is offered in the spirit of constructively contributing to continued improvements to the CalSim-II model.
2. Based on the sub-set of CalSim-II logic reviewed for this report we are confident in the validity of our conclusions that we used them to motivate the following proposed work plan.
3. Like most water resource planning models, CalSim-II is path dependent. Much of the model logic governing the simulated system operation is governed by the state of the system at a particular moment in time, and this state will evolve differently under alternative assumptions about the environmental regulations governing system operations. This means that examining model code is not a sufficient method for understanding the implications of different model formulations. In the end, changes in the code must be implemented and the implications of these changes must be measured by examining model output. For these reasons recommend that the CalSim-II development team implement this workplan and evaluate the magnitude of potential changes in model output.

With these impressions on the table, our conclusion after having completed the environmental review are that the work plan for creating a full environmental compliance formulation should focus on:

- Removing all vestiges of perfect foresight from the definition of environmental regulations governing system operations;
- Revising the (b)(2) accounting logic to align it with what we consider to be the current interpretation of the CVPIA; and
- Introducing a minimum flow standard from the San Joaquin River.

Removing Perfect Foresight from the Definition of Environmental Regulations

In developing the work plan for this CalSim-II model improvement, we adopt the assumption implicit in the definition of environmental regulations as constraints on system operations, namely that they are of a higher priority than any other water management objectives in the system. As such, at any particular moment in a CalSim-II simulation, the model should anticipate that environmental regulations should be met to the fullest possible extent, unless and until conditions dictate that environmental regulations can be relaxed. This is not the approach taken in the current CalSim-II formulation, which relies on water year indices defined during the February or March time step, to determine if environmental regulations can be relaxed.

this allows too much pumping and export south

For example, consider the definition of the obligation associated with the (b)(2) account as described in Table 1. In February, with the benefit of perfect foresight, a determination is made regarding whether the annual (b)(2) obligation is 800 TAF, 700 TAF, or 600 TAF. In order to meet the full environmental compliance standard and honor the top priority assumption implicit in the definition of environmental constraints, the strictest possible regulations must be anticipated until enough information is available to decide otherwise. In much the same way that CalSim-II uses forecasts to introduce uncertainty into its promised water deliveries, uncertainty needs to influence the establishment of environmental regulations.

As discussed above, in calculating the value of WSI during the February time step. CalSim-II uses the level of precipitation that has been exceeded 99% of the time during the remaining months of the water year in order to forecast what reservoir inflow will be available for allocation during the coming months. This threshold drops to 90% during the March time step, 75% during the April time step, and 50% during the May time step. This is a prudent risk management strategy, as it assumes the worst when much is still unknown about what the future holds. A corollary to this prudent posture is to also assume that environmental constraints will be at their most stringent when much is still unknown about what the future holds. Perfect foresight is not consistent with this risk management posture.

To satisfy a full environmental compliance standard, all of the indices used in CalSim-II need to be calculated dynamically based on prudent forecasts about what the future may hold. In February the question should be what are the environmental constraints that will be in place going forward assuming that future inflows associated with the level of precipitation exceeded 1% of the time during the remainder of the water year is used to forecast the relevant indices. The answer to this question will surely be the most stringent set of environmental constraints. As time passes and the future becomes more certain then the level risk tolerance related to calculating water year indices can be increased. During the March time step the question would be what are the environmental constraints that will be in place going forward assuming that future inflows are associated with the level of precipitation exceeded 10 % of the time during the remainder of the water year are used to update the relevant indices. In April the threshold would drop to 25% and then to 50% in May. By applying this corollary to the risk tolerance already applied to project water supply availability, the top priority environmental constraints would not be weakened until there was justification for doing so.

Under this formulation, the calculation of the water supply index and use of the WSI-DI and DelCar Curves to translate WSI into a promised level of deliveries to meet current water demands does not change. During years when perfect foresight allowed for an early weakening of environmental constraints under the old formulation, however, under the new formulation the promised deliveries will be subject to more stringent environmental constraints during some portion of the February to June period. This may mean that CalSim-II could fail to meet the water delivery promises generated by the current set of risk management curves (the red dot in Figure 3). In keeping with the risk tolerance philosophy implicit in these curves, they should be retrained as part of the full

environmental compliance formulation in the event that significant delivery shortfalls materialize so that less water is promised to other water uses in the system.

Activity 1: Internalize the calculation of water year indices used to set environmental regulations.

This activity involves moving the values of water year indices used to set environmental regulations from external look-up tables where they are stated with perfect foresight into the actual WRESL code where they will be updated continuously based on forecasted inflows.

Activity 2: Define risk tolerance posture with respect to anticipated environmental regulations.

We propose that the 1% exceedence probability of forecasted inflows be used for the months of October-February. This will assure that the strictest possible environmental regulations will be anticipated during that period when large amounts of uncertainly exist about the future. As a corollary to the risk tolerance implicit in the forecasts used to support water allocation, assume that the 10% exceedence inflow will be used in March, 25% in April, and 50% in May. By June that water year index can be set definitively for the remainder of the water year.

Activity 3: Construct the forecasted inflow data tables that will drive the continuous calculation of water year indices.

The forecasted inflows used to support water allocation are read in to CalSim-II from an external file. A similar set of anticipated inflow tables would need to be developed to capture the risk tolerance posture adopted for anticipating environmental regulations.

Activity 4: Implement WRESL code required to adjust environmental regulations based on the continuous evolution of water year indices.

In the current version of CalSim-II, the environmental regulations create a pre-determined constraint on simulated system operations. The new formulation would require WRESL code to look-up the regulations associated with an evolving series of water year indices.

Activity 5: Update the WSI-DI and DelCar curves to reflect the change in underlying constraint set.

As the underlying constraint set used to develop the WSI-DI and DelCar curves, which was based on the application of perfect foresight in setting environmental constraints, will be modified by implementing the preceding activities, it may be necessary to update these risk tolerance defining curves as higher environmental flows will likely be required during the late winter and early spring months.

REVISING THE (B)(2) ACCOUNTING LOGIC

While the method used in applying environmental actions against the (b)(2) account has been the subject of legal and administrative wrangling since the passage of CVPIA in 1992, we believe that the logic employed in CalSim-II to capture the currently accepted accounting methodology is not entirely consistent with the current legal interpretation of

the Act. We recognize that this conclusion derives from our interpretation of current law, so it is probably worthwhile to articulate our position on this point.

First, we believe that the intent of (b)(2) was to rededicate a portion of the CVP yield back to fish and wildlife enhancement objectives, primarily the restoration of anadromous fish. While courts have found that Delta water quality actions, which benefit Delta resident fish and consumptive water users relying on water drawn from the Delta, could be considered as acceptable charges against the (b)(2) account, they stipulated "*as long as the allocation gives effect to the hierarchy of purposes established in section 3406(b)(2)*". Here we believe the intent was clear as Section 3406(b)(2) of the Central Valley Project Improvement Act states that the CVP will:

> "dedicate and manage annually 800,000 acre-feet of Central Valley Project yield for the **primary purpose** of implementing the fish, wildlife, and habitat restoration purposes and measures authorized by this title; to assist the State of California in its efforts to protect the waters of the San Francisco Bay/Sacramento-San Joaquin Delta Estuary; and to help to meet such obligations as may be legally imposed upon the Central Valley Project under State or Federal law following the date of enactment of this title, including but not limited to additional obligations under the Federal Endangered Species Act."

We also believe that fish, wildlife, and habitat restoration purposes and measures specifically include the anadromous fish doubling goal included in the Act.

The current CalSim-II formulation turns this notion of primacy upside down by fully changing water quality actions to (b)(2), as well as other non-fish motivated actions, while using fish and wildlife actions to make up any remaining obligations to the (b)(2) account. This stems from the fact that the D-1641 step is run before the (b)(2) step and that all changes in the release and export metrics associated with the difference between the D-1485 and D-1641 steps are charged to (b)(2) with perfect foresight for the water year. In addition, in reviewing various environmental regulations we discovered several other actions of questionable fish and wildlife value that are charged to (b)(2). All this occurs before any fish and wildlife (b)(2) action occurs.

We propose an alternative course of action that envisions the implementation of a new step in the CalSim-II formulation. In keeping with its implicit focus on anadromous fish recovery, this new step is provisionally referred to as the salmon step. The sequence of (b)(2) actions currently used in CalSim-II, as shown in Table 21, is a good starting point for developing the elements of the salmon step. We feel that the highest priority should be assigned to AFRP releases (currently priority 3) as these are designed specifically to meet the anadromous fish-doubling target that was also part of the CVPIA. If this were the case, the type of limitations on AFRP releases that are contained in Table 8 and Table 13 would be unnecessary as these are intended to minimize AFRP flows when significant credits to the (b)(2) account can be derived from the D-1641 step.

A second level of priority would be assigned to the VAMP export priorities (current priority 2), as well as the pre- and post-VAMP restrictions (currently priorities 7 and 4 respectively). As all of these actions would occur after the October to March period

during which AFRP flows would be implemented, it should be possible to consider the three components of the VAMP export limitations as a single action.

The final actions in the new salmon step would include the export ramping and the 3000 cfs export limit actions anticipated for the month of June. As these occur after the VAMP export restrictions, a decision will be made in June as to whether they are necessary.

Action Description	Priority of Action	Reserve* for Action (taf)	Balance† Req'd to Trigger Action (taf)	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
WQCP Support (D-1641)	1														
AFRP Releases	3		1												
Export Reductions (150 taf)	6	150	1+2+3+4+5+6												
VAMP Export Restrictions	2	115													
Post VAMP Export Restrictions	4	45	1+4												
Export Ramping	5	60	1+5												
3000 cfs Export Limit	2														
Pre VAMP Export Restrictions	7	40	1+2+4+4+7												
Export Reductions (35 taf)	8	35													

* Average reserve amount. Actual reserves may depend on water year type and or other hydrologic conditions. Reserves for multi-month actions represent the amount required to complete the entire actions

† (b)(2) balance after accounting for past costs and current month WQCP(D-1641) support. Values refer to the sum of the reserve amounts associated with the action priorities.

A couple of clarifying points are useful at this point in the discussion. Based on the removal of perfect foresight from the establishment of environmental regulations described above, the exact (b)(2) obligation will not be known as the AFRP actions are implemented between October and March. If this creates a situation whereby AFRP actions result in greater charges against (b)(2) than are finally called for based on the evolution of water year indices, the excess will be changed against the (b)(2) account during the following water year.

Second, several local environmental regulations that are of questionable fishery value, namely the stability criteria on the Sacramento and American Rivers and the diversion of water that would otherwise spill in the Trinity system, are currently charged against (b)(2). In implementing the new salmon step, these charges would not be allowed.

Finally, as the proposed salmon actions are implemented sequentially, there is no need to define and manage reserves and triggers as is the case in the current (b)(2) step. The proposed anadromous fish related actions would simply be implemented in sequence until the (b)(2) obligations is satisfied.

Following the completion of the new salmon CalSim-II step, the current D-1641 step would be implemented. This step contains regulatory drivers related to Delta water quality to protect Delta resident fish and water users who draw water from the Delta. It

seems to us that these two drivers are so tightly bound in the D-1641 step that it is unreasonable to separate actions driven by fishery objectives from those driven by consumptive water needs. Therefore we acknowledge that should any remaining (b)(2) obligations remain after the new salmon step, all D-1641 actions can be used to satisfy this obligation, even if they are designed primarily to protect the interest of consumptive water users. As in the case of the new salmon step, D-1641 actions will be implemented sequentially, although in this step, D-1641 actions will continue even after (b)(2) obligations are retired.

If additional (b)(2) obligations remain at the end of the D-1641 step, then a revised (b)(2) step will be implemented. This step will sequentially implement the December-January export reductions, the February-March export reductions, and the May export limit actions described in Table 21, as needed until the (b)(2) obligation for the year is retired. If (b)(2) obligations remain following this step, they will be forgiven.

While there will be surely be discussion of the legal underpinning of this alternative formulation of the (b)(2) accounting logic, we do not feel that the assignment of first priority to Delta water quality objectives relative to (b)(2) obligations complies with the intend of CVPIA or court findings. The following steps are needed to implement this aspect of the compliance work plan.

Activity 1: Create and implement the new salmon CalSim-II step.
This step will involve adding a new step that sequentially implements the AFRP, VAMP export reductions, and June actions up to the limit of the (b)(2) account that will evolve over the course of the water year according to the forecast based water year indices. Stability releases and Trinity transfers to avoid spills will not be charges against (b)(2) in this step.

Activity 2: Implement conditional logic to govern the implementation of the final revised (b)(2) CalSim-II step.
Under the proposed CalSim-II formulation the (b)(2) obligation may or may not be retired following the D-1641 step. CalSim-II logic must be developed to control the flow of the model depending on the status of the (b)(2) account at the end of the D-1641 step. This conditional flow is depicted in Figure 12.

INCLUDING MINIMUM INSTREAM FLOWS FOR THE SAN JOAQUIN RIVER BELOW FRIANT
The final proposed environmental compliance element is the inclusion of a minimum instream flow requirement for the San Joaquin River below Friant Dam. This is motivated by the recent ruling that called upon the Bureau of Reclamation to release sufficient water to restore the anadromous fishery in the reach between Friant and the Merced River confluence. While the ruling provided no specific guidelines as to release schedule required to satisfy this obligation, it is clear that a release regime will be a part of the environmental regulatory structure in the future and needs to be implemented in CalSim-II. The following work plan steps are needed to accomplish this goal.

Activity 1: Define a release schedule
As part of the failed settlement negotiations, several proposed release regimes for the lower San Joaquin River were developed. This task would involve deciding on two flow regimes from the proposed alternatives that will bracket the potential flow regime.

Activity 2: Implement the Friant Release Logic
Add WRESL code to CalSim-II that can read the release requirements from a look-up table.

Activity 3: Perform Sensitivity Analysis on the two Release Regimes
Run the model with both release regimes and assess the sensitivity of model results to the difference. If the model is highly sensitive, two baselines may be needed. If the model is insensitive, institute a compromise between the two as part of the CalSim-II baseline.

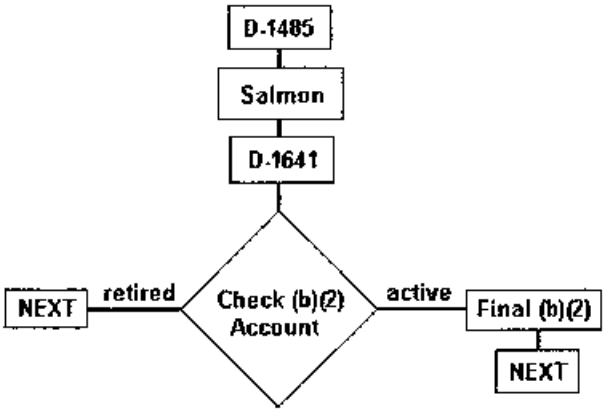

Figure 12: Proposed CalSim-II Flow Chart

Environmentally Preferred CalSim-II Formulation Work Plan

As could reasonably be expected, the definition of an environmentally preferred CalSim-II formulation is a more ambitious activity than the comparison of the current model formulation against a standard of regulatory compliance. It implies that the management of California water systems will be adjusted until the point that ecosystems protected under current law are restored rather than a legalistic determination of whether or not the model accurately represents current regulations that may not be meeting restoration objectives. While the preceding discussion focusing on the full environmental compliance workplan was quite focused and detailed, the following discussion of an environmentally preferred formulation will be broader. In addition, our suggestions regarding required modifications to the CalSim-II code associated with the environmentally preferred formulation will be more strategic and less prescriptive.

With this qualification on the table, our conclusions after having completed the environmental review are that the work plan for creating a full environmental compliance formulation should focus on:

- Adapting several existing regulations to conform more with future conditions that are either anticipated or desired and would avoid the legal impacts associated with a failure to achieve real aquatic ecosystem restoration.
- Introducing operational flexibility to the CalSim-II code so that alternative sets of environmental flow regimes, beyond the establishment of minimum instream flows, can be simulated and evaluated.

In each case, several existing regulations or alternative flow regimes are presented. For each, a possible approach for CalSim-II modifications associated with the specific regulation or regime are summarized without defining a specific set of activities required to implement these modifications. These activities can be developed once an agreement has been reached to implement a specific element of the environmentally preferred formulation.

Adapting the Representation of Existing Regulations

The following changes to specific regulations are proposed for the environmentally preferred CalSim-II formulation. As with the full compliance workplan, these items are not meant to be exhaustive as a comprehensive inventory of all existing regulations was not performed. They are representative, however, of the kind of incremental improvements in the environmental regulatory structure that may be of interest.

Changes to the Vernalis Salinity Standard

Action: CalSim-II should be reformulated to evaluate an EC standard on the San Joaquin River at a point upstream of the Stanislaus River confluence. The contribution of a San Joaquin River fishery release schedule from Friant Dam should be considered as a source of water to help meet this standard. Doing so will dramatically reduce the amount of water that needs to be released from New

Melones Dam to dilute the salt load at Vernalis, shifting responsibility for San Joaquin salinity control to all water users on the San Joaquin River.
Possible Approach: This can be accomplished by reconfiguring reservoir release arcs upstream of the Stanislaus to include sub-arcs for meeting the salinity standard. CalSim-II is incapable of directly evaluating salinity as a function of flow, so this suggestion requires that new empirical relationships between flow and salinity be developed with higher spatial and temporal resolution than the flow salinity relationship now used to control the Vernalis salinity standard.

Shift the position of X2

Action: The X2 compliance point should be moved to the western Delta when this would most benefit conditions for Delta-dependent species. Closing the Delta Cross Channel Gates as recommended in the AFRP to assist salmon smolt outmigration will affect the location of X2 and move it further to the west than would otherwise be the case. Limiting Delta export pumping when smolts are in the Delta will also result in X2 being further to the west. The combined effect of changes and Delta operations and the maintenance of X2 in the western Delta needs to be evaluated in CalSim-II.
Possible Approach: Evaluate the latest scientific understanding concerning the estuarine water quality needs of key species during their various life stages in order to refine where the X2 standard should be set. Update the Kimmerer-Monismith equation and the supporting data tables to accommodate this refined understanding, including some consideration of the operation of the cross channel gates and restrictions on Delta exports. Introduce these changes into CalSim-II.

Changes to Folsom/Nimbus Operations

Action: A portion of Folsom reservoir storage space should be held in reserve to assure adequate water supply for maintaining targeted instream flows and water temperatures for salmonid fishes at levels identified by AFRP and/or Sacramento Water Forum.
Possible Approach: This can be accomplished through either the development of a dummy reservoir, or the adjustment of the "dead storage" level to absorb target storage reservations. Dead storages have very high weights, which means that the model resists releasing from the dead storage pool until the most severe conditions are encountered.

Action: Increases in Sacramento Water Forum demand above current levels should have lower priority than instream flow, temperature and reservoir reserves for environmental use.
Possible Approach: Incremental increases to Sacramento River withdrawals beyond the 2000 Level of Development could be performed in cycles subsequent to those considering environmental flow objectives, and be given a weight corresponding to junior water rights holders or interruptible deliveries.

Action: Reduce reliance on the American River for maintaining Delta water quality standards and cap Folsom/Nimbus releases for the purpose of meeting

Delta outflow requirements at 4000 cfs. This would result in greater sharing of the responsibility for meeting Delta water quality standards between all Sacramento Valley tributaries. It may also be possible to share this responsibility with San Joaquin Valley tributaries in light of the fact that upper San Joaquin River releases will most likely occur in the future.

Possible Approach: This suggestion requires the inclusion of non-CVP reservoirs (particularly Oroville) in the call for both X2 and the Water Quality standards within the ANN. The cap on reservoir releases is, however, relatively straightforward to achieve in CalSim, as it would require logic similar to the manner in which orchards downstream of New Melones are protected from high flows. Spreading responsibility for Delta water quality standards to the San Joaquin River tributaries would require the introduction of feedback between North of Delta operations and the simulated San Joaquin River Delta inflow contribution.

Modify Delta Export Restrictions

Action: The benefits of enhanced Delta outflow, as well as more balanced Delta inflows associated with changes to Folsom/Nimbus operations, should be complemented by increased constraints on exports. During the February 1-June 15 period, exports should be capped at 35% of total inflow and/or <200% of Vernalis flow (2:1 export:Vernalis ratio).

Possible Approach: The current configuration of CalSim-II could be changed to accommodate this policy suggestion without major revision.

Action: VAMP (enhanced San Joaquin tributary flows + curtailed exports) should be expanded from 31 days to 61 days (April 1- May 31). The upper San Joaquin River releases should be included as a potential contribution to satisfying VAMP.

Possible Approach: The current configuration of CalSim-II could be changed to accommodate this policy suggestion without major revision.

Action: From October 1-Feb 29, a total of 60 days of DCC gate closures should be allowed.

Possible Approach: The current configuration of CalSim could be changed to accommodate this policy suggestion without major revision.

Refinement of the (b)(2) Accounting Rules

Action: Offset and Reset accounting rules should be used. If (b)(2) water is released from a reservoir and the reservoir subsequently fills and spills, the amount of water released from the reservoir earlier in the water year should not be charged to the (b)(2) account. If (b)(2) water is used to curtail CVP exports and the CVP responds by concurrently reducing reservoir releases that had been supporting some (or all) of the higher export rate, (b)(2) should only be charged for the difference.

Possible Approach: When (b)(2) was originally implemented, the Offset/Reset accounting rules were coded into CalSim-II. Although CalSim-II has undoubtedly changed in configuration since Offset/Reset was abandoned, most of

the former code should be usable in re-establishing the old accounting system in the current model.

Action: The "zero credit" treatment of the (b)(2) metric should be eliminated. When the (b)(2) step produces release and export metrics are less than the D-1485 "baseline" the (b)(2) account should be credited by the amount of the difference. ***Possible Approach:*** The current configuration of CalSim-II could be changed to accommodate this policy suggestion without major revision.

ALLOWING FOR EVALUATION OF ALTERNATIVE FLOW REGIMES

As stated at the very beginning of this report, the natural flow regime that characterizes the rivers of the Central Valley has been significantly modified by the water development that has taken place over the course of the past 100 years. While fully recreating this natural hydrology is not possible given the extent to which California relies on the installed hydraulic infrastructure, it is important to explore the degree to which system operations could be modified to mimic the natural hydrology within the context of the multiple objectives to which these operations respond. Under an environmentally preferred formulation, CalSim-II would be able to contribute to this sort of evaluation. CalSim-II already is able to handle environmental constraints related to minimum flow and acceptable rates of change in stream flow. Under an environmentally preferred formulation, this functionality should be used to investigate alternative regulatory regimes, such as full implementation of the AFRP recommendations. In addition, however, CalSim-II functionality should be added to accommodate the following potential changes in the flow regime that are of interest to the environmental community.

1. Period High Flow Events

Action:

All streams should have regularly occurring high flows that help restore the riparian forest, move and sort gravel, clean out silt from deep holes in the river bed, topple trees to create large woody debris in the stream and help maintain the naturally occurring conditions that depend on periodic high water. These high flow events need to recede at a rate consistent with the needs of newly germinating plants in the riparian forest. Appropriate high flow levels and the rate at which they recede will need to be determined for each stream. Current ecological understanding suggests that such events should occur once every five to ten years.

All the streams do not need to flood in the same year, though when storm induced floods do occur, the ramping down of the high water should be done at the rate needed for new riparian seedlings to become established. When natural flooding and receding doesn't occur, it should be scheduled and the flows accounted for in the long-term operation of upstream dams. Done in a coordinated manner, these flood flow releases can arrive in the Delta to meet the needs of the export pumps. For example, while some rivers are "flooding" in one winter, other rivers could be experience "man made" drought conditions. The flows into the delta are stable but the streams are benefiting from periodic, scheduled "floods".

2. Summer Low Flows

Action:

It is not natural to have high summer flows on the Sacramento, Feather, Yuba, American and other rivers in California's Central Valley. Presently these streams run high in the summer to meet water export demands in the Delta. The preferred condition should be a changed in how water is stored and delivered to the south via the Delta so that stream flows can drop in the summer and rise in the winter.

Until the infrastructure of Delta island reservoirs, groundwater conjunctive use reservoirs or local southern California water supplies are built, the best that can be done is an adaptive management plan of rotating low flows for these different streams. Both the volume and duration of low flows need to be evaluated for invasive weed reduction and restoration benefits.

The ability to investigate these components of the flow regime will require the development of new WRESL code. The actual design of software upgrades will be developed should the proposed functionality be included in a future environmentally preferred formulation of the CalSim-II model.

Conclusions

Having completed this environmental review of the CalSim-II model, we are left with the profound impression that it is not a tool that can – under its current formulation – fully address the legally required water management objectives. CalSim-II is, after all, a tool that has been designed to determine how best to operate the state's hydraulic infrastructure in ways that maximize the satisfaction of contractual demands. This reality is a result of both the history of water model development in California and a general analytical approach that has held sway for decades in the field of water resources planning and analysis. This approach holds that the environment is a constraint on system operations, not one of the objectives for which the system should be managed. In order to create a tool that can investigate water management innovations designed to comply with the law and restore the environment, it is not simply a matter of adjusting a few input parameters. Instead, a reformulation of the model along the lines described in this document is needed.

CalSim-II holds that the environment is a constraint on system operations, not one of the objectives for which the system should be managed. In order to create a tool that can investigate water management innovations designed to comply with the law and restore the environment, it is not simply a matter of adjusting a few input parameters.

This philosophy of including the environment as an objective in water resources management is gaining credence around the world. Unfortunately, in California we cannot get to this point if we limit ourselves to the current version of CalSim-II. On the positive side, it is clear that no one views the current version of CalSim-II as the final and definitive water planning tool. An effort is underway to develop CalSim-III, which will respond to many of the critiques that have been offered about the model in recent months and years.

The conclusions of this report are offered to constructively contribute to this evolution. We feel that they will elevate, when implemented, aquatic ecosystem restoration to a place alongside of the other water management objectives in the system as is consistent with the imperatives of law and policy. A failure to respond to these critiques would demonstrate, on the other hand, that the water management community has little interest in viewing ecosystem restoration as more that a nettlesome constraint that has to be dealt with, preferably in the most minimal fashion. This would represent a division more profound than some varying professional opinions about the best way to model a complex water resource system.

ENV-28
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(3 pgs)

Gerald Johns' Memo

Jan de Leeuw

October 23, 2005

These are brief comments on a Gerald Johns' memo to the Monterey Plus EIR Committee dd 90/22/05 re CALSIM II.

The argumentation in the memo is somewhat defensive and not always convincing. It is certainly true that the use of a model "to simulate actions in the system is valid and recognized practice". In fact, there is no alternative, because there is no physical copy of the system which can be used for experimentation. This does not imply, however, that the use of CALSIM II is "an acceptable and valuable analysis method". Such a conclusion certainly does not follow from the fact the models in general are useful, and asserting from the start that CALSIM II is valuable obviously begs the question if it is indeed valuable. The argument that DWR and other agencies have "consistently used CALSIM II" is not convincing either, unless it can be shown that this use has indeed led to better or more reliable predictions of supply than any of the available alternatives.

The memo does little more than summarizing the support materials that are available, without emphasizing that some of this material is quite critical of CALSIM II. The fact that CALSIM II is a cooperation between federal and state agencies may be important to federal and state bureaucrats, but it cannot be used as an argument in favor of the model. Similarly, the argument that using an optimization engine is what many other modeling

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systems do is not a cogent argument, because it relies solely on authority and not on superior performance compared to other approaches. Intuitively, optimization engines do not seem to be very natural tools to model complex systems, because they assume all operators in the system are optimizers in possesion of perfect information. Also, by its very nature, if you maximize deliveries to purveyors, then of course you overestimate actual deliveries.

The memo adds the by now standard DWR disclaimer that "Traditional model calibration and verification process is difficult to apply to a planning model, such as CALSIM II, that simulates operations and water supplies at a fixed level of development". To me this has always seemed in appropriate testimonium paupertatis on the one hand, and a unconvincing attempt to have your cake and eat it too. Either CALSIM II is a model that describes the operations of SWP/CVP and is used to make predictions about future water supply to the purveyors, or it isn't. If it is, then it surely must be able to withstand traditional calibration and verification processes, because these are the only ways to assess its quality. If it is not such a model, then it clearly should not be used as such.

As I have said elsewhere, the main problems with CALSIM II is that it is only tested on a very limited set of realistic scenarios to assess its sensitivity, that it does not take the essentially stochastic nature of model inputs into account, that it optimizes deliveries instead of modeling actual deliveries, and that it has weak links between optimizations for successive time points. The actual implementation of CALSIM II has many additional problems. The documentation is virtually non-existent, the course of the program is not available, and the actual manipulations by DWR and its consultants to produce results from the program are shrouded with a mysterious layer of unassailable expertise.

In fact, at a recent CALSIM meeting in Sacramento, someone from the audience asked the chair of the peer review committee if anyone on the committee had ever tried to actually run the CALSIM II program. Somewhat surprisingly, the answer was no. For actual

not good

CALSIM II results the peer review relied on runs provided by DWR and its consultants. It is clear that such a strategy implies that what we studying is not just the actual computer program, but it is whatever goes on when the experts are producing their results, including possible non-documented tweaks and iterative attempts to "improve" the results of the runs. The CALSIM II provides much opportunity for such tweaking, for instance by relaxing "hard" to "soft" constraints.

I want to make this point perfectly clear, admittedly exaggerating (although I don't know by how much). There is no guarantee that the results in the SWP Delivery Reliability Report actually come from CALSIM II runs. The whole process of arriving at these results is not sufficiently transparent for others to be able to reproduce the results, and whenever that is the case a true peer review and true scientific scrutiny are not possible.

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attachment #12 (3 pgs)

ENV-28

Mr. Gerald Johns
Deputy Director, DWR

October 2, 2005

Subject: Response to Director Johns' Letter of September 22, 2005 on CALSIM II

Dear Mr. Johns:

The letter was directed to the EIR committee but in fact it deals with comments generated by the plaintiff group of the committee. The comments we have generated over the past several months go to the technical validity of the model, CALSIM II, and because of its shortcomings its use as the tool in the Monterey Plus EIR. In your letter you make several assertions that are intended to respond to our comments but none really deal with the technical shortcomings of the model. As we have attempted to point out, the model contains fundamental errors in its construction that probably cannot be readily fixed. To continue to use this model in the EIR process will jeopardize the entire validity of the EIR. Accordingly, it is important that the Department undertake actions to address the vulnerability of the EIR.

You state that the model is an important tool to "study many technical and policy issues related to water supply reliability, environmental management and performance, water demands, economics, hydrology and climate, and regulatory compliance." In truth the model is not really specified to do these things and its construction is ill-suited to do them. Water supply reliability requires a model that has verified absolute accuracy, which can only be accomplished by calibration of this model to the historical record, which the Department has steadfastly refused to do.

Environmental management and performance would require that the model output provides measures that can be reasonably used to perform these tasks. In fact, the model treats the environmental issues as constraints buried in the hard code of the model and some of these constraints are of lower priority than water deliveries in the model. Furthermore, the constraints are based primarily on studies of the response of the environment in the Sacramento basin to conditions and project operations prior to the Monterey Amendments. Because this uncalibrated model now predicts that average future deliveries can be increased by 50% over pre-Monterey operations, a review of those old constraints is absolutely required. The current conditions of ecological collapse in the Delta demand it. But this model is exceedingly cumbersome to use for this purpose. What new constraints should be offered? Shouldn't we be going back to the State Water Resources Control Board for review? These are questions that need to be answered before an EIR is ever published.

Water demands are not treated by this model save for the users in the Sacramento Valley, most of who are not SWP beneficiaries. In fact, the model assumes that all SWP contractors except MWD and KCWA will request full Table A amounts from now on. Furthermore, as we have pointed out in our previous comments, at least one of those demands is totally unrealistic and that is the case of San Luis Obispo County for which the model assumes 25,000 acre-feet as its annual request when in fact it has SWP pipeline capacity for only 4800 acre-feet. Other demands can also be argued to be without any merit. One must conclude that the model is not being used to "study …water demands"

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when in fact demands are taken as fixed inputs to the model without any critical evaluation of the capabilities of the contractors to take such amounts.

Similar arguments can be raised as to how much the model is used to study "regional hydrology." As with demands, the most important hydrologic input is the historical record of major stream runoff into the Central Valley. If this hydrologic record had been studied, one would have immediately found that its statistical makeup is very complex and that the simple tacit assumptions built in to the model regarding that makeup are just plain wrong. The statistical flaws impact both the interpretation given to the model's output and to the fundamental specification of indices used in the model. These flaws are of such degree that both the model and the indices need to be re-specified. The model as it stands is basically useless as a tool for EIR or reliability studies.

In general, the model is ill-specified for the uses to which it is being put in the Monterey Plus EIR. A correctly specified model would begin with environmental variables as dependent variables rather than constraints. In other words, we need a model in which one can input hydrology and demands and retrieve as output changes in the environment. CALSIM II does the exact opposite. In fact, it is very reasonable to question a model that is designed to maximize exports as in any way suitable to study environmental impacts.

Your assertion that CALSIM II is an accepted tool for use in environmental impact analysis and planning is not warranted. The Peer Review Committee strongly recommended that CALSIM II be calibrated properly if it is to be used for objective measures of system performance. Both reliability assessment and environmental impact analysis both depend on objective measures.

And again, I must take issue with your general assertions of "good faith" efforts on the part of DWR staff. The Department has been asked on several occasions beginning with the settlement negotiations on through the EIR preparation to perform calibration of the model. The Department has stonewalled on this request for close to 5 years now.

As to your comments on how the Department has made its choice to use this model after receiving comments from many forums, again there has been a total reluctance to join the technical issues of the model's flaws. We made very specific comments on the draft Reliability report questioning the statistical use of the output data. There was no response from anyone in DWR to support its particular use of statistics. In general, the Department has never attempted to join the issue of the statistical flaws in the model, continuing to dismiss criticisms to that effect with broad statements such as you make here. We must consider these broad statements to be totally inadequate as a response.

You refer to the Peer Review Committee's report to substantiate your general claims for this model. However, you should realize that the Peer Review Panel made its comments about optimization models and their suitability as a general approach. Their more specific claims about the use of CALSIM II were not supportive. And we must remind the Department that the Peer Review Panel was asked to review a model without any specific application in mind nor without any model specification. In fact, we have not seen a model specification against which we can validate the model's performance. A model specification is an essential step in any model development. We are sure that if the original model specification had called for the ability to perform environmental impact

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analyses and delivery reliability assessments it would have been structured in a completely different fashion. It certainly would have called for model calibration and that requirement would have led to a model whose structure would readily allow calibration. We have been continually told that this model can't be calibrated, which we consider nonsense.

With regard to the Department's report where they outline their continuing effort to establish trust in and credibility for the model, we regard that as nothing but "spin" given the Department's stonewalling on critical technical issues that have more to do with developing "trust and credibility".

Finally, if your letter was intended to be a response to technical comments, we regard it as totally unresponsive.

Sincerely,

Arve R. Sjovold
Plaintiff Citizens Planning
Association Representative
To The EIR Committee

attachment #13 (1 pg)

ENV-28

SOME INSIGHTS ON WATER DELIVERIES TO SETTLEMENT CONTRACTORS

By: Arve R. Sjovold
October 24, 2004

In the course of reviewing the use of specific indices in the CALSIM II model it was brought to my attention that the Feather River Settlement Contractors agreed in the contracts to receive 50% cutbacks in years designated "drought years." The 50% cutback is against their total demand according to the research conducted by Jeffrey Payne. What is interesting about this particular requirement is what it does to the rights of the Settlement Contractors when viewed from the perspective of the Monterey Amendments and the Environmental Water Account (EVA).

The feature of the Monterey Amendments that is of interest is the removal from the master contracts of provision 18 (a), the provision that called for agricultural cutbacks first in time of drought. The primary beneficiary of this removal has been Kern County Water Agency (KCWA), which now takes all the water it can get to store in the Kern Water Bank to be sold back to the EWA. Clearly, if the Settlement Contractors did not take cuts in drought years, as KCWA no longer has to do, there would be less water going south, especially to KCWA. In fact, the settlement contractors could then be the benefactors for the EWA and could also be the beneficiaries of the payouts from the EWA. Given the construct of the EWA, this only seems fair since it is water from the watershed of origin that is at issue and should by senior right belong to the Settlement Contractors.

There is also a factor of fairness involved here. When the SWP and Oroville Dam were authorized is when these settlement contracts were executed. At that time, the SWP contracts included the 18 (a) provision, so one could fairly state that SWP ag contractors and settlement contractors were being treated equally. Now that Monterey has attempted to do away the ag first provision in the SWP contracts, it only seems fair at a minimum that the same provision be deleted from the settlement contracts.

ON THE ADEQUACY OF CALSIM II FOR ENVIRONMENTAL IMPACT ANALYSIS AND SWP RELIABILITY ANALYSIS

attachment #14 (4pgs)

ENV-29

By: Arve R. Sjovold

August 12, 2004

Introduction:

The matter of application of CALSIM II to a variety of analyses has been questioned by many in water resources analyses, most notably by the scientific peer review team recently convened by the California Bay Delta Authority Science Program, Association of Bay Governments whose comments have been documented in a report dated December 4, 2003. In that report the peer review panel made many comments on the adequacy of CALSIM II which have yet to be acted upon. Several of the comments are directly related to the adequacy of CALSIM II to address the applications of environmental impact analyses and delivery reliability analyses of the SWP. The peer review was broad in reach and was not directed toward any specific application. However, its comments regarding the applications cited above are very pertinent now that the Department of Water Resources (DWR) is moving ahead to use this model for purposes of assessing the environmental impacts of the Monterey Amendments to the SWP contracts and because the Castaic Lake Water Agency (CLWA) is also using the same model outputs for justifying its Urban Water Management Plan and a controversial action to claim as lawful a 41,000 acre-foot transfer of SWP entitlement from the Kern County Water Agency.

Because DWR has not acted on any of the peer review recommendations regarding deficiencies in CALSIM II, it is important that a clear statement be made regarding CALSIM II's adequacy to pursue both the environmental impact analysis of the Monterey Amendments and the CLWA proposed action. Because both environmental impact analysis and delivery reliability analyses require some measure of accuracy in their assessments it is vitally important to assess the accuracy of the CALSIM II calculated estimates. We and the peer review panel agree that calibration of the model is paramount if we are to make any confident statements of accuracy for this model. To date DWR has refused to do a timely calibration of the model even though they have been asked on many occasions over the past several years to do so. It is disingenuous on their part now to move ahead with production runs from this model arguing that they have insufficient time to do a proper calibration. Nevertheless, there are some definitive statements that can be made at this time based on the information made available by DWR in various documents.

Accuracy

Both the preliminary outputs for the environmental impact analysis and the documented outputs from the reliability assessment performed by DWR show levels of export from the Delta that average 50% higher than any estimates of actual average

exports evident to date. These predicted levels of export are not qualified by any statements of how accurate they may be based on comparisons to the historical record. In responses to comments received on their final report on delivery reliability they did include some comparisons to predicted and actual deliveries during the most recent drought (1987-1992). That report also reported actual delivery history through 2003. Although the comparison during the drought seems quite good, that same comparison shows that the SWP could not come close to requested deliveries (Demands) over that period. Additional information supplied by DWR in the appendices of that report also shows that even after the drought, actual deliveries showed large shortfalls below requests. Table 1 shows the data extracted from the DWR reports. (These data are for Table A requests and Table A deliveries.)

Table 1

COMPARISONS OF ACTUAL DELIVERIES AND REQUESTED DEMANDS (maf/yr) 1987 to 2002

Year	Requested Demands	Actual Deliveries
1987	2.7	2.14
1988	2.6	2.32
1989	3.0	2.71
1990	3.1	2.45
1991	3.5	0.55
1992	3.6	1.38
1993	2.75	2.10
1994	2.7	1.75
1995	3.15	1.87
1996	2.7	2.21
1997	3.0	2.29
1998	3.2	1.62
1999	3.2	2.52
2000	3.6	2.71
2001	4.05	1.39
2002	3.9	2.52

It is apparent that throughout this period the SWP had difficulty meeting requests. It is significant to note that the last several years bracket the year 2001, which is one of the parametric levels of development for which CALSIM II calculates expected deliveries. It is also noteworthy that the average delivery for the last 6 years in this series is virtually the same as the first 6 years, the acknowledged period of the drought. The series shows a trend whereby the requests slowly increase over time but in the last 6 years of the series the contractor requests are virtually at the same level as that parametrized for the CALSIM II 2001 run. Accordingly, it is difficult to see how DWR can state that the primary reason that past deliveries are not as high as the model now predicts for the 2001

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run is "..that the contractors did not ask for enough in the past." These data clearly show that the SWP has difficulty averaging more than 2.0 maf independent of request levels. It also demonstrates why it is important to calibrate this model so that we can deduce why it fails to accurately reproduce the historical record by any ordinary accounting. We may conclude that the CALSIM II model, absent calibration, is inadequate for any application relying on the accuracy of its calculations. One may state that, based on the data record of requests and deliveries, that the CALSIM II model overestimates deliveries by at least 50% on average. We can further state that the SWP based on the history of actual deliveries can not be relied upon for more than 2.0 maf of total delivery, approximately 48% of Table A entitlements. The record also clearly shows that in the depths of a prolonged 6 year drought that the average reliable delivery is not more than 38%(See my analysis of the statistical analysis of the CALSIM II calculations; "ANALYSIS OF SWP RELIABILITY OF DELIVERY", November 11, 2003.) We may further state that without a peer reviewed calibration and appropriate documentation, that CALSIM II cannot be relied upon for the accuracy of its calculations. These are all important conclusions regarding the adequacy of CALSIM II to support environmental impact analysis or for estimating SWP delivery reliability.

We also note that the charts presenting the results of the CALSIM II runs in support of the Monterey EIR seem to predict even higher deliveries overall than was shown in the DWR reliability report for ostensibly the same conditions and constraints. The reliability report presents 73 year average deliveries of approximately 3.1 to 3.2 maf for the 2020 scenario while the more recent runs are reporting 3.4 maf for the same scenario. A difference of this amount needs to be explained as to where the additional water is coming from.

Another factor affecting the accuracy and utility of CALSIM II calculations is the reconciliation of its optimal outputs with feasible SWP operational scenarios. It is a characteristic of an optimization methodology as used in CALSIM II to substitute the optimization algorithm for the detailed simulation of all the decision operations that properly depict the real system. In the particular optimization used in CALSIM II the set of solution weights is the surrogate for all the decision criteria that would ordinarily be simulated. In order to render the results of the optimization calculations useful, the set of solution weights must be reduced to a realistic, feasible set of decision criteria that can be implemented. Otherwise, there is no assurance that the optimization results are realizable.

Environmental Impact analysis

DWR has recently presented draft presentations of CALSIM II outputs in support of environmental impact analysis for the Monterey Amendments EIR. These calculations are performed on the same basis as those used in the SWP reliability of delivery analysis in that the model is not calibrated and the methodology is the same. However, the impact analysis proceeds on assumptions that may or may not be applied to previous calculations for reliability delivery. Most important, beyond the fundamental deficiency of an uncalibrated model, are the assumptions made on the priority of exports.

One of the fundamental scenarios in effect mandated by the Court of Appeals is to study the "no project alternative." This is the scenario where it is envisioned that DWR invokes Article 18(b) to address the chronic deficiency to deliver full entitlement

3.

amounts as articulated in the SWP contracts. If Article 18(b) is invoked it requires that DWR reduce uniformly the stated Table A entitlements of all the contractors down to a level that reasonably conforms to the ability of the project to deliver those entitlements reliably. The data in Table 1 above suggest that this new level of aggregate entitlement should be about 2.0 maf or less compared to the original 4.23 maf of the original contracts. This represents a uniform lowering of contractor entitlements to approximately 47%. If DWR were to take this action, it would raise the question of how water exports would be managed when there is more water coming into the Delta than would seem necessary to meet entitlements, the so-called "surplus" water.

The calculations performed by DWR with CALSIM II assume that all the water that arrives in the Delta is available solely to the projects after meeting regulatory requirements in the Delta and after providing for Delta uses. The regulatory requirements that are assumed are those prevailing today. Therefore, the calculations simply treat the surplus water created by invoking Article 18(b) as water to be freely exported as before. In consequence, the amounts shown in the preliminary runs show nearly similar totals to those without invoking Article 18(b). The only significant difference between runs with and without Article 18(b) invoked is the label put on the water exported; the amounts are the same.

There are several things wrong with this assumption regarding surplus water. If indeed there is water that is surplus to regulatory constraints it does not necessarily mean that it is in the same entitlement category as entitlement water (i.e. Table A water). This is especially true when one considers that present operations have not redressed nor restored the Delta environment. If water is surplus beyond entitlement water its use to redress environmental damage in the Delta must be given priority over exports as surplus. At the very least, CALFED should not be required to pay for water to put in the environmental water account to offset costs to would-be entitlement exports when the SWP is mandated to stop pumping for protection of endangered species. In fact, export of so-called surplus water should be accorded lower priority than any watershed of origin claims. In other words, surplus water should be dedicated to protection of the environment in the watershed of origin before consideration is given to export to what are recognized as junior water rights holders. We cannot accept that export water has superior claim to water originating in the Sacramento and Trinity watersheds in analyzing environmental impacts of this project. The environmental impact analysis must consider the use of surplus water in fashioning an environmentally superior alternative to the assumed no-project alternative used in developing CALSIM II estimates. Furthermore, we must acknowledge that regulatory constraints established on the basis of existing operations, especially when considering the adversarial nature of the process of water rights hearings, cannot be considered as fixed limits on future operations that on their face propose to export at least 50% more water than the conditions that led to those constraints. Calculations that purport to show that 50% more water can be exported than present operations must be subjected to careful scrutiny as to the likelihood of even more damage to the environment than has already been sustained. We cannot simply assume that the existing constraints are satisfactory to de-limit environmental impacts in the face of increased exports. The calculations must reflect real considerations of more stringent constraints with increasing exports if they are to be used for environmental impact assessments.

4.

In previous meetings of the EIR sub-committee on modeling, flow charts of the simulation network that is modeled were presented. At those meetings objections were raised concerning the lack of any fidelity in network representation for south-of-Delta operations. This especially concerns operations of the San Joaquin and Stanislaus rivers as well as the operations of the Kern Water Bank. We have since learned that detailed networks for the San Joaquin and Stanislaus systems have indeed been developed for other analyses. We see no reason why this detail should not be included in the CALSIM II model used for the Monterey Amendments EIR. We also note that even in this additional detail, no distinction is made between exports of entitlement and surplus water as far as priority of uses in the model calculations. We request that in all CALSIM II simulated systems in either the Sacramento or San Joaquin valleys, the simulations carefully reflect that surplus water flows, where ever they may occur, should be represented as lower priority than water shed of origin uses, whether in-stream or diversions for beneficial use.

We have also learned that SWP and CVP contractor demand functions are used on their face to establish the amounts of exports that guide the optimization of the CALSIM II model, while the settlement contractors in the area-of-origin are modeled by simulation of actual applied water requirements based on land use. Since the water rights of export are necessarily junior to those of the settlement contractors we see no reason why export contractor demand, at a minimum, should not be modeled to the same degree as the settlement contractors. In fact, the modeling of settlement contractor demands based on land uses in the Sacramento and Feather River areas show that these diversions are approximately 1maf less than the maximum under the settlement contracts. This means that export amounts calculated by CALSIM II include in effect a "borrowing" of water that by right belongs to settlement contractors. Is it proper to include such water as entitlement water to exporters when it may in fact be taken by senior rights holders at some unspecified time?

We also note the export demand functions are assumed at Table A levels for all but the two largest contractors, MWD and KCWA, even though most of the contractors do not have sufficient storage to balance wet year deliveries with dry year deliveries. (See my analysis of the reliability report previously cited.) We also note that the SWP contractor demand functions for each contractor must be developed consistent with the ability of the contractor to accept SWP water when it is available. In many cases, without equalizing storage, a contractor cannot even accept his full annual entitlement because of capacity constraints. Our calculations on this limitation could limit the effective delivery of entitlement water to about 60% of the full Table A annual entitlement in some cases. The degree to which a specified contractor can avail himself of SWP deliveries depends critically on how he structures his priority of use of his different sources of supply. To maximize SWP entitlement deliveries, a contractor may often have to forego the use of a cheaper, local source and instead pay a little more to secure a higher reliability of delivery of SWP water. To our knowledge none of these considerations have been factored in to the assumptions of contractor demand and the preliminary calculations produced by CALSIM II cannot be taken as realistic.

Reliability of Delivery Analysis

5.

For reliability of SWP deliveries it should be clear that only deliveries against Table A amounts can be accounted. Since the majority of SWP deliveries are designated as M&I, those uses, which entail fixed structures dependent on firm water supplies, cannot be tied to speculative deliveries associated with so-called "surplus" water. The calculations supplied by CALSIM II to date do not distinguish the importance of the delivery categories to the reckoning of reliability of supply. Even those contractors that have some level of equalizing storage by which they can store surplus wet year deliveries to be used in times of drought should have to demonstrate and implement a plan to use the deliveries in that way before any surplus deliveries can be accounted as firm supply, and the amounts of surplus delivery to be expected must meet all the requirements for environmental protection in the watersheds of origin as cited above.

We must also state that DWR's continued use of frequency charts to present the results of its calculations on reliability of delivery is unwarranted. There is no statistical basis presented by DWR to show why drought deliveries should be lumped with normal and wet year deliveries in a single frequency diagram. (Again see my analysis of delivery reliability cited above.) This flagrant misuse of statistics is now being seized upon by local planning authorities who adopt SWP reliabilities that cannot in fact be sustained. The consequence is that in all probability local land use plans are being based on erroneously high deliveries that are the epitome of "paper water." Irrespective of the accuracy and deficiencies of CALSIM II, DWR must provide more robust statistical analyses of CALSIM II outputs if they are to be useful to anyone.

The assessment of SWP delivery reliability must depend on calculations that meet stringent requirements of accuracy and proper statistical practice. Neither requirement is presently met by the CALSIM II model.

Conclusions

Because of the necessity of having accurate estimates of SWP deliveries under the scenarios cast for the EIR impact analyses, it is absolutely required that this model be calibrated and peer reviewed for that calibration. Based on the record to date of SWP operations there is no reason to believe that the CALSIM II calculations have any utility for EIR impact analyses.

The scenarios that have been cast must be reformulated to consider uses of so-called "surplus" water for environmental restorations and enhancement in the water sheds of origin. It cannot be taken as given that water identified by the SWP contracts as surplus to whatever level of Table A entitlements is free to be exported solely to the contractors.

The calculations of CALSIM II must be reported in more detail to deduce environmental impacts. At a minimum, estimates for delivery to each contractor must be reported by month and arrayed against each contractor's monthly requests. DWR must ascertain the validity of each contractor's water supply plan insofar as the use of SWP water is involved. Of particular concern is the availability of equalizing storage in each contractor's service area. This is to assure that no contractor is taking water for beneficial use that can be claimed by a superior right holder in the watersheds of origin.

DWR must provide for a more thorough and robust statistical analysis of CALSIM II's calculated outputs. The present portrayals are simply improper and not

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deserving of the effort that has gone in to generating the outputs. The present outputs cannot be used to make any useful estimates of reliability of delivery.

DWR must show that the optimization results represent a feasible solution of realistic decision criteria by which the project can be operated.

7.

attachment #15 (6 pgs) ENV-28

Emissions pathways, climate change, and impacts on California

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Contributed by Christopher B. Field, June 23, 2004

The magnitude of future climate change depends substantially on the greenhouse gas emission pathways we choose. Here we explore the implications of the highest and lowest Intergovernmental Panel on Climate Change emissions pathways for climate change and associated impacts in California. Based on climate projections from two state-of-the-art climate models with low and medium sensitivity (Parallel Climate Model and Hadley Centre Climate Model, version 3, respectively), we find that annual temperature increases nearly double from the lower B1 to the higher A1fi emissions scenario before 2100. Three of four simulations also show greater increases in summer temperatures as compared with winter. Extreme heat and the associated impacts on a range of temperature-sensitive sectors are substantially greater under the higher emissions scenario, with some interscenario differences apparent before midcentury. By the end of the century under the B1 scenario, heatwaves and extreme heat in Los Angeles quadruple in frequency while heat-related mortality increases two to three times; alpine/subalpine forests are reduced by 50–75%; and Sierra snowpack is reduced 30–70%. Under A1fi, heatwaves in Los Angeles are six to eight times more frequent, with heat-related excess mortality increasing five to seven times; alpine/subalpine forests are reduced by 75–90%; and snowpack declines 73–90%, with cascading impacts on runoff and streamflow that, combined with projected modest declines in winter precipitation, could fundamentally disrupt California's water rights system. Although interscenario differences in climate impacts and costs of adaptation emerge mainly in the second half of the century, they are strongly dependent on emissions from preceding decades.

California, with its diverse range of climate zones, limited water supply, and economic dependence on climate-sensitive industries such as agriculture, provides a challenging test case to evaluate impacts of regional-scale climate change under alternative emissions pathways. As characterized by the Intergovernmental Panel on Climate Change, demographic, socioeconomic, and technological assumptions underlying long-term emissions scenarios vary widely (1). Previous studies have not systematically examined the difference between projected regional-scale changes in climate and associated impacts across scenarios. Nevertheless, such information is essential to evaluate the potential for and costs of adaptation associated with alternative emissions futures and to inform mitigation policies (2).

Here, we examine a range of potential climate futures that represent uncertainties in both the physical sensitivity of current climate models and divergent greenhouse gas emissions pathways. Two global climate models, the low-sensitivity National Center for Atmospheric Research/Department of Energy Parallel Climate Model (PCM) (3) and the medium-sensitivity U.K. Met Office Hadley Centre Climate Model, version 3 (HadCM3), model (4, 5) are used to calculate climate change resulting from the SRES (Special Report on Emission Scenarios) B1 (lower) and A1fi (higher) emissions scenarios (1). These scenarios bracket a large part of the range of Intergovernmental Panel on Climate Change nonintervention emissions futures with atmospheric concentrations of CO_2 reaching ≈550 ppm (B1) and ≈970 ppm (A1fi) by 2100 (see *Emissions Scenarios* in *Supporting Text*, which is published as supporting information on the PNAS web site). Although the SRES scenarios do not explicitly assume any specific climate mitigation policies, they do serve as useful proxies for assessing the outcome of emissions pathways that could result from different emissions reduction policies. The scenarios at the lower end of the SRES family are comparable to emissions pathways that could be achieved by relatively aggressive emissions reduction policies, whereas those at the higher end are comparable to emissions pathways that would be more likely to occur in the absence of such policies.

Climate Projections

Downscaling Methods. For hydrological and agricultural analyses, HadCM3 and PCM output was statistically downscaled to a 1/8° grid (≈150 km²) (6) and to individual weather stations (7) for analyses of temperature and precipitation extremes and health impacts. Downscaling to the 1/8° grid used an empirical statistical technique that maps the probability density functions for modelled monthly precipitation and temperature for the climatological period (1961–1990) onto those of gridded historical observed data, so the mean and variability of observations are reproduced by the climate model data. The bias correction and spatial disaggregation technique is one originally developed for adjusting General Circulation Model output for long-range streamflow forecasting (6), later adapted for use in studies examining the hydrologic impacts of climate change (8), and compares favorably to different statistical and dynamic downscaling techniques (9) in the context of hydrologic impact studies.

Station-level downscaling for analyses of temperature and precipitation extremes and health impacts used a deterministic method in which grid-cell values of temperatures and precipi-

Freely available online through the PNAS open access option.

Abbreviations: DJF, December, January, February; HadCM3, Hadley Centre Climate Model, version 3; JJA, June, July, August; PCM, Parallel Climate Model; SRES, Special Report on Emission Scenarios; SWE, snow water equivalent.

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Table 1. Summary of midcentury (2020–2049) and end-of-century (2070–2099) climate and impact projections for the HadCM3 and PCM B1 and A1fi scenarios

			2020–2049				2070–2099			
			PCM		HadCM3		PCM		HadCM3	
	Units	1961–1990	B1	A1fi	B1	A1fi	B1	A1fi	B1	A1fi
Change in statewide avg temperatures										
Annual	°C	15.0	1.35	1.5	1.6	2.0	2.3	3.8	3.3	5.8
Summer (JJA)	°C	22.8	1.2	1.4	2.2	3.1	2.15	4.1	4.6	8.3
Winter (DJF)	°C	7.6	1.3	1.2	1.4	1.45	2.15	3.0	2.3	4.0
Change in statewide avg precipitation										
Annual	mm	544	−37	−51	+6	−70	+38	−91	−117	−157
Summer (JJA)	mm	20	−3	+2	−1	−7	+4	−46	−5	−1
Winter (DJF)	mm	269	−45	−55	+4	−44	+13	−13	−79	−92
Sea level rise	cm	—	8.7	9.5	11.6	12.7	19.2	28.8	26.8	40.9
Heatwave days										
Los Angeles	Days	12	28	35	24	36	44	76	47	95
Sacramento	Days	58	91	101	93	104	109	134	115	138
Fresno	Days	92	113	120	111	116	126	147	126	149
El Centro	Days	162	185	185	176	180	191	213	197	218
Length of heatwave season*	Days	115	135	142	132	141	149	178	162	204
Excess mortality for Los Angeles†										
Without acclimatization	avg no. of deaths/yr	—	—	—	—	—	394	948	667	1,429
With acclimatization	avg no. of deaths/yr	165	—	—	—	—	319	790	551	1,182
Change in April 1 snowpack SWE										
1,000–2,000 m elevation	%	3.6 km³	−60	−56	−58	−66	−65	−95	−87	−97
2,000–3,000 m elevation	%	6.5 km³	−34	−34	−24	−36	−22	−73	−75	−93
3,000–4,000 m elevation	%	2.3 km³	−11	−15	4	−16	15	−33	−48	−68
All elevations	%	12.4 km³	−38	−37	−26	−40	−29	−73	−72	−89
Change in annual reservoir inflow‡										
Total	%	21.7 km³	−18	−22	5	−10	12	−29	−24	−30
Northern Sierra	%	15.2 km³	−19	−22	3	−9	9	−29	−20	−24
Southern Sierra	%	6.5 km³	−16	−23	10	−14	17	−30	−33	−43
Change in April–June reservoir inflow‡										
Total	%	9.1 km³	−20	−24	−11	−19	−1	−46	−41	−54
Northern Sierra	%	5.5 km³	−21	−24	−16	−19	−6	−45	−34	−47
Southern Sierra	%	3.6 km³	−18	−24	−2	−19	5	−47	−52	−65
Change water year flow centroid‡										
Total	Days	03/26	0	2	−15	−7	−7	−14	−23	−32
Northern Sierra	Days	03/13	0	3	−16	−5	−3	−11	−18	−24
Southern Sierra	Days	05/01	−10	−7	−19	−12	−22	−34	−34	−43

avg, average; JJA, June, July, August; DJF, December, January, February; SWE, snow water equivalent.

*The number of days between the beginning of the year's first and end of the year's last heatwave.

†Reference period is 1990–1999, and projections are for the period 2090–2099.

‡Results are for inflows to seven major dams and reservoirs in the Sacramento/San Joaquin water system, including three in the Northern Sierra (Shasta, Oroville, and Folsom) and four in the Southern Sierra (New Melones, New Don Pedro, Lake McClure, and Pine Flat).

tation from the reference period were rescaled by simple monthly regression relations to ensure that the overall probability distributions of the simulated daily values closely approximated the observed probability distributions at selected long-term weather stations (7). The same regression relations were then applied to future simulations, such that rescaled values share the weather statistics observed at the selected stations. At the daily scales addressed by this method, the need to extrapolate beyond the range of the historically observed parts of the probability distributions was rare even in the future simulations (typically <1% of the future days) because most of the climate changes involve more frequent warm days than actual truly warmer-than-ever-observed days (7).

Except where otherwise noted, we present projected climate anomalies and impacts averaged over 2020–2049 (with a midpoint of 2035) and 2070–2099 (here designated as end-of-century, with a midpoint of 2085), relative to a 1961–1990 reference period.

Temperature. All simulations show increases in annual average temperature before midcentury that are slightly greater under the higher A1fi emissions scenario (see Fig. 4, which is published as supporting information on the PNAS web site). By end-of-century, projected temperature increases under A1fi are nearly twice those under B1, with the more sensitive HadCM3 model producing larger absolute changes (Table 1). Downscaled seasonal mean temperature projections (10) show consistent spatial patterns across California, with lesser warming along the southwest coast and increasing warming to the north and northeast (Fig. 1). Statewide, the range in projected average temperature increases is higher than previously reported (11–14), particularly for summer temperature increases that are equal to or greater than increases in winter temperatures.

APPLIED PHYSICAL SCIENCES

ECOLOGY

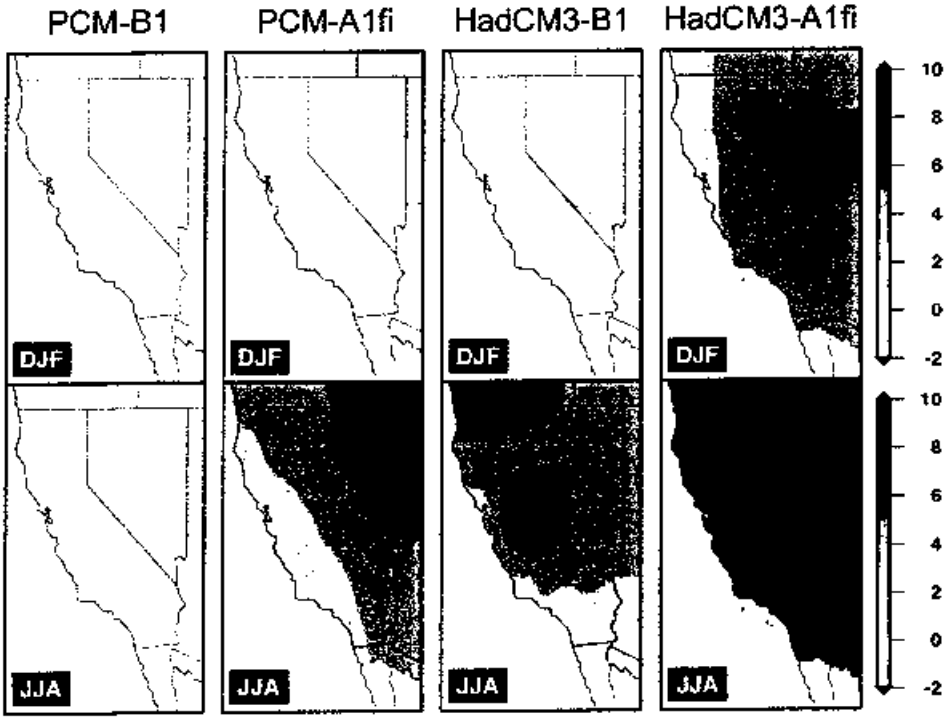

Fig. 1. Downscaled winter (DJF) and summer (JJA) temperature change (°C) for 2070–2099, relative to 1961–1990 for a 1/8° grid. Statewide, SRES B1 to A1fi winter temperature projections for the end of the century are 2.2–3°C and 2.3–4°C for PCM and HadCM3, respectively, compared with previous projections of 1.2–2.5°C and 3–3.5°C for PCM and HadCM2, respectively. End-of-century B1 to A1fi summer temperature projections are 2.2–4°C and 4.6–8.3°C for PCM and HadCM3, respectively, compared with previous projections of 1.3–3°C and 3–4°C for PCM and HadCM2, respectively (11–14).

Precipitation. Precipitation shows a tendency toward slight decreases in the second half of the century with no obvious interscenario differences in magnitude or frequency (see Figs. 5–10, which are published as supporting information on the PNAS web site). Three of four simulations project winter decreases of −15% to −30%, with reductions concentrated in the Central Valley and along the north Pacific Coast. Only PCM B1 projects slight increases (≈7%) by the end of the century (Table 1). These results differ from previous projections showing precipitation increases of 75–200% by 2100 (11–13), but they are consistent with recent PCM-based midrange projections (14, 15). The larger-scale pattern of rainfall over North America is more uniform across scenarios, showing an area of decreased (or lesser increase in) precipitation over California that contrasts with increases further up the coast (see Fig. 11, which is published as supporting information on the PNAS web site). Because interdecadal variability often dominates precipitation over California, projected changes in climate and impacts associated with the direct effects of temperature should be considered more robust than those determined by interactions between temperature and precipitation or precipitation alone.

Extreme Heat and Heat-Related Mortality

Temperature extremes increase in both frequency and magnitude under all simulations, with the most dramatic increases occurring under the A1fi scenario. Changes in local temperature extremes were evaluated based on exceedance probability analyses, by using the distribution of daily maximum temperatures downscaled to representative locations (16). Exceedance probabilities define a given temperature for which the probability exists that X% of days throughout the year will fall below that temperature (i.e., if the 35°C exceedance probability averages 95% for the period 2070–2099, this means that an average of 95% or ≈347 days per year are likely to lie below 35°C). For the four locations examined for extreme heat occurrence (Los Angeles, Sacramento, Fresno, and Shasta Dam), mean and maximum temperatures occurring 50% and 5% of the year increase by 1.5–5°C under B1 and 3.5–9°C under A1fi by the end of the century. Extreme temperatures experienced an average of 5% of the year during the historical period are also projected to increase in frequency, accounting for 12–19% (B1) and 20–30% (A1fi) of days annually by 2070–2099 (see Fig. 12, which is published as supporting information on the PNAS web site).

The annual number of days classified as heatwave conditions (3 or more consecutive days with temperature above 32°C) increases under all simulations, with more heatwave days under A1fi before midcentury (see Fig. 13, which is published as supporting information on the PNAS web site). Among the four locations analyzed, increases and interscenario differences are proportionally greatest for Los Angeles, a location that currently experiences relatively few heatwaves. By the end of the century, the number of heatwave days in Los Angeles increases four times under B1, and six to eight times under A1fi. Statewide, the length of the heatwave season increases by 5–7 weeks under B1 and by 9–13 weeks under A1fi by the end of this century, with interscenario differences emerging by midcentury (Table 1; see also Fig. 14, which is published information on the PNAS web site).

The connection between extreme heat and summer excess mortality is well established (17). Heat-related mortality estimates for the Los Angeles metropolitan area were determined

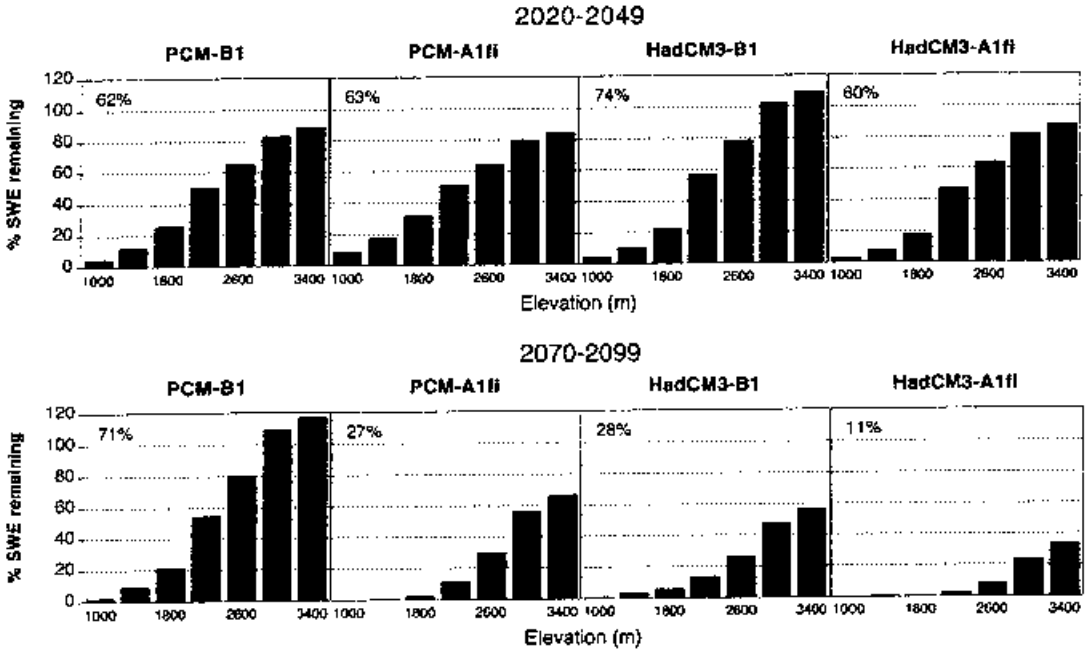

Fig. 2. Average snowpack SWE for 2020–2049 and 2070–2099 expressed as a percent of the average for the reference period 1961–1990 for the Sierra Nevada region draining into the Sacramento–San Joaquin river system. Total SWE losses by the end of the century range from 29–72% for the B1 scenario to 73–89% for the A1fi scenario. Losses are greatest at elevations below 3,000 m, ranging from 37–79% for B1 to 81–94% for A1fi by the end of the century. Increases in high elevation SWE for midcentury HadCM3 B1 and end-of-century PCM B1 runs result from increased winter precipitation in these simulations.

by threshold meteorological conditions beyond which mortality tends to increase. An algorithm was developed to determine the primary environmental factors (including maximum apparent temperature, number of consecutive days above the threshold apparent temperature, and time of year) that explain variability in excess mortality for all days with apparent maximum temperatures at or above the derived daily threshold apparent temperature (18) value of 34°C (see *Heat-Related Mortality* in *Supporting Text*). Estimates do not account for changes in population or demographic structure.

From a baseline of ≈165 excess deaths during the 1990s, heat-related mortality in Los Angeles is projected to increase by about two to three times under B1 and five to seven times under A1fi by the 2090s if acclimatization is taken into account (see *Heat-Related Mortality* in *Supporting Text*). Without acclimatization, these estimates are about 20–25% higher (Table 1). Actual impacts may be greater or lesser depending in part on demographic changes and societal decisions affecting preparedness, health care, and urban design. Individuals likely to be most affected include elderly, children, the economically disadvantaged, and those who are already ill (19, 20).

Impacts on Snowpack, Runoff, and Water Supply

Rising temperatures, exacerbated in some simulations by decreasing winter precipitation, produce substantial reductions in snowpack in the Sierra Nevada Mountains, with cascading impacts on California winter recreation, streamflow, and water storage and supply. Snowpack SWE was estimated by using daily, bias-corrected and spatially downscaled temperature and precipitation to drive the Variable Infiltration Capacity distributed land surface hydrology model. The Variable Infiltration Capacity model, using the resolution and parameterization also implemented in this study, has been shown to reproduce observed streamflows when driven by observed meteorology (10) and has been applied to simulate climate change (8) in this region. April 1 SWE decreases substantially in all simulations before midcentury (see Fig. 15, which is published as supporting information on the PNAS web site). Reductions are most pronounced at elevations below 3,000 m, where 80% of snowpack storage currently occurs (Table 1 and Fig. 2). Interscenario differences emerge before midcentury for HadCM3 and by the end of the century for both models. These changes will delay the onset of and shorten the ski season in California (see *Impact of Decreasing Snowpack on California's Ski Industry* in *Supporting Text*).

Water stored in snowpack is a major natural reservoir for California. Differences in SWE between the B1 and A1fi scenarios represent ≈1.7 km^3 of water storage by midcentury and 2.1 km^3 by the end of the century for HadCM3. For PCM, overall SWE losses are smaller, but the difference between the A1fi and B1 scenarios is larger by the end of the century, representing >4 km^3 of storage. Reductions for all simulations except PCM under the lower B1 emission scenario are greater than previous projections of diminishing snowpack for the end of the century (8, 21). By 2020–2049 the SWE loss is comparable to that previously projected for 2060 (22).

Warmer temperatures and more precipitation falling as rain instead of snow also causes snowmelt runoff to shift earlier under all simulations (Table 1), which is consistent with earlier studies (23). The magnitude of the shift is greater in the higher-elevation Southern basins and under the higher A1fi scenario. Stream inflows to major reservoirs decline because of diminished snowpack and increased evaporation before midcentury, except where winter precipitation increases (Table 1). The greater reductions in inflows seen under A1fi are driven by both higher temperatures and lower average precipitation as compared with B1.

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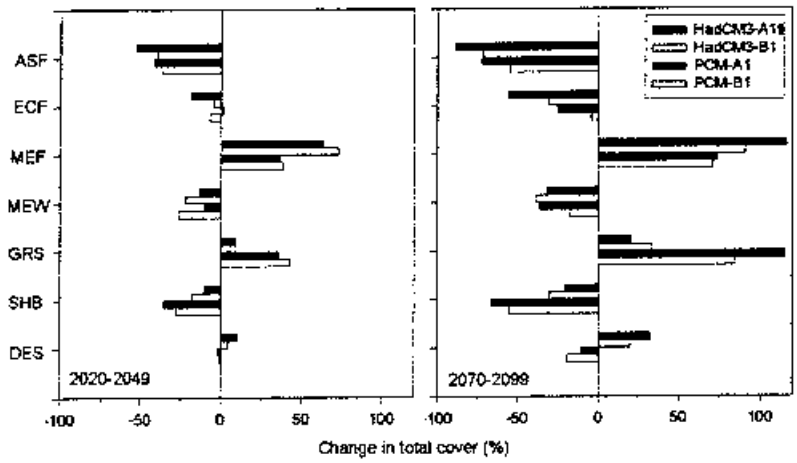

Fig. 3. Statewide change in cover of major vegetation types for 2020–2049 and 2070–2099, relative to simulated distributions for the 1961–1990 reference period. ASF, alpine/subalpine forest; ECF, evergreen conifer forest; MEF, mixed evergreen forest; MEW, mixed evergreen woodland; GRS, grassland; SHB, shrubland; DES, desert. Increasing temperatures drive the reduction in alpine/subalpine forest cover and cause mixed conifer forest to displace evergreen conifer forest in the Sierra Nevada Mountains and the North Coast. Mixed conifer forest in the South Coast expands because of increased humidity and reduced fire frequency. Because of drier conditions and increased fire frequency in inland locations, grassland displaces shrubland and woodland, particularly in the PCM simulations, whereas warmer and drier conditions under HadCM3 cause an expansion of desert cover in the southern Central Valley.

Earlier runoff may also increase the risk of winter flooding (7). Currently, state operators maintain ≈12 km^3 of total vacant space in the major reservoirs to provide winter and early spring flood protection,[n] a volume approximately equal to that stored in the natural snowpack reservoir by April 1st. Capturing earlier runoff to compensate for future reductions in snowpack would take up most of the flood protection space, forcing a choice between winter flood prevention and maintaining water storage for the summer and fall dry period use. Flood risk and freshwater supply are also affected by higher sea levels, which are projected to rise 10–40 cm under B1 and 20–65 cm under A1fi by 2100 (Table 1; see also Fig. 16, which is published as supporting information on the PNAS web site).

Declining Sierra Nevada snowpack, earlier runoff, and reduced spring and summer streamflows will likely affect surface water supplies and shift reliance to groundwater resources, already overdrafted in many agricultural areas in California (24). This could impact 85% of California's population who are agricultural and urban users in the Central Valley, San Francisco Bay Area, and the South Coast, about half of whose water is supplied by rivers of the Central Valley. Under A1fi (both models) and B1 (HadCM3), the projected length, frequency, and severity of extreme droughts in the Sacramento River system during 2070–2099 substantially exceeds what has been experienced in the 20th century. The proportion of years projected to be dry or critical increases from 32% in the historical period to 50–64% by the end of the century under all but the wetter PCM B1 scenario (see Table 2, which is published as supporting information on the PNAS web site). Changes in water availability and timing could disrupt the existing pattern of seniority in month-dependent water rights by reducing the value of rights to mid- and late-season natural streamflow and boosting the value of rights to stored water. The overall magnitude of impacts on water users depends on complex interactions between temperature-driven snowpack decreases and runoff timing, precipitation, future population increases, and human decisions regarding water storage and allocation (see *Impacts on Water Supply* in *Supporting Text*).

Impacts on Agriculture and Vegetation Distribution

In addition to reductions in water supply, climate change could impact California agriculture by increasing demand for irrigation to meet higher evaporative demand, increasing the incidence of pests (25), and through direct temperature effects on production quality and quantity. Dairy products (milk and cream, valued at $3.8 billion annually) and grapes ($3.2 billion annually) are the two highest-value agricultural commodities of California's $30 billion agriculture sector (26). Threshold temperature impacts on dairy production and wine grape quality were calculated by using downscaled temperature projections for key counties, relative to average observed monthly temperatures.[o]

For dairy production, losses were estimated for temperatures above a 32°C threshold (27), as well as for additional losses between 25°C (28) and 32°C. For the top 10 dairy counties in the state (which account for 90% of California's milk production), rising temperatures were found to reduce production by as much as 7–10% (B1) and 11–22% (A1fi) by the end of the century (see Table 3, which is published as supporting information on the PNAS web site). Potential adaptations may become less practical with increasing temperature and humidity (29).

For wine grapes, excessively high temperatures during ripening can adversely affect quality, a major determinant of market value. Assuming ripening occurs at between 1,150 and 1,300 biologically active growing degree days (30), ripening month was determined by summing modeled growing degree days above 10°C from April to October, for both baseline and projected scenarios. Monthly average temperature at the time of ripening was used to estimate potential temperature impacts on quality. For all simulations, average ripening occurs 1–2 months earlier and at higher temperatures, leading to degraded quality and marginal/impaired conditions for all but the cool coastal region

[n]See the U.S. Army Corps of Engineers Flood Control Requirements for California Reservoirs, Sacramento District Water Control Data System, Sacramento, CA (www.spk-wc.usace.army.mil).

[o]See Western U.S. Climate Historical Summaries (Western Regional Climate Center) at www.wrcc.dri.edu/climsum.html.

under all scenarios by the end of the century (see Table 3, which is published as supporting information on the PNAS web site). As with other perennial crops, adaptation options to shift varieties or locations of production would require significant time and capital investment.

The distribution of California's diverse vegetation types also changes substantially over the century relative to historical simulations (Fig. 3; see also Fig. 17, which is published as supporting information on the PNAS web site). Projections of changes in vegetation distribution are those given by MC1, a dynamic general vegetation model that simulates climate-driven changes in life-form mixtures and vegetation types; ecosystem fluxes of carbon, nitrogen, and water; and fire disturbance over time (31). Vegetation shifts driven primarily by temperature, such as reductions in the extent of alpine/subalpine forest and the displacement of evergreen conifer forest by mixed evergreen forest, are consistent across models and more pronounced under A1fi by the end of the century. Changes driven by precipitation and changes in fire frequency are model-dependent and do not exhibit consistent interscenario differences. Most changes are apparent before mid-century, with the exception of changes in desert cover. The shift from evergreen conifer to mixed evergreen forest and expansion of grassland are consistent with previous impact analyses (13), whereas the extreme reduction in alpine/subalpine forest and expansion of desert had not been reported in previous impacts assessments (12, 13).

Conclusions

Consistent and large increases in temperature and extreme heat drive significant impacts on temperature-sensitive sectors in California under both lower and higher emissions scenarios, with the most severe impacts occurring under the higher A1fi scenario. Adaptation options are limited for impacts not easily controlled by human intervention, such as the overall decline in snowpack and loss of alpine and subalpine forests. Although interscenario differences in climate impacts and costs of adaptation emerge mainly in the second half of the century, they are largely entrained by emissions from preceding decades (32). SRES scenarios do not explicitly assume climate-specific policy intervention, and thus this study does not directly address the contrast in impacts due to climate change mitigation policies. However, these findings support the conclusion that climate change and many of its impacts scale with the quantity and timing of greenhouse gas emissions (33). As such, they represent a solid starting point for assessing the outcome of changes in greenhouse gas emission trajectories driven by climate-specific policies (32, 34), and the extent to which lower emissions can reduce the likelihood and thus risks of "dangerous anthropogenic interference with the climate system" (35).

We thank Michael Dettinger and Mary Meyer Tyree for providing assistance with data and analysis, and Frank Davis for providing review of earlier drafts of this manuscript. PCM model results were provided by PCM personnel at the National Center for Atmospheric Research, and HadCM3 model results were provided by Dr. David Viner from the U.K. Met Office's Climate Impacts LINK Project. This work was supported in part by grants from the David and Lucile Packard Foundation, the William and Flora Hewlett Foundation, the Energy Foundation, the California Energy Commission, the National Oceanic and Atmospheric Administration Office of Global Programs, and the Department of Energy.

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attachment 15(a) (5 pgs)

ENV-28

COMMENTS ON DWR'S TECHNICAL MEMORANDUM

"Progress on Incorporating Climate Change into Management of California's Water Resources", July 2006

By Arve R. Sjovold
September 2, 2006

In DWR'S year 2002 report on the "The State Water Project Delivery Reliability Report" it was explicitly acknowledged that climate change would affect the timing and amounts of snowfall and possibly precipitation and that sea level rise was likely. At that time the timing of these impacts was speculative. That report promised that more definitive studies of the impact on climate change would be provided, possibly as soon as the update of the California Water Plan Update 2003. Thus, it was with some anticipation that I looked forward to a comprehensive study of the affects of climate change on the SWP. The subject report fails to provide that comprehensive study. Although DWR did engage in some rather elaborate computerized calculations, the subject of those calculations studiously avoided the impacts, now more widely recognized, but clearly acknowledged in the 2002 Reliability Report. Any keenly interested observer of the debate on climate change would have expected a cogent and objective analysis of the effects of sea level rise and changed Sierra run-off patterns as first order effects.

The report devotes considerable of its quantitative analyses to the calculations of the effects of a very modest sea level rise of 15 inches on the ability of the Delta to deliver water to the pumps without severe violations of salinity thresholds. It does so based on assumptions that upstream reservoir operations are not changed and that sea level rise does not change the hydraulic network in the Delta. Another assumption for this analysis is that the salinity gradient in the western Delta does not change with this sea level rise. No supporting evidence or analysis is given as to why these assumptions are reasonable. In other words, a primary assumption is that the current system of Delta levies remains in tact with a 15 inch sea level rise. I won't argue that that level of sea level rise may indeed leave the levies operationally in tact, but it misses the first order question of what level of sea level rise will compromise the system of levies. There are good maps (produced by DWR, if I am not mistaken) of what the Delta may look like with 1, 2, 4, and 10-foot sea level rises. From these maps it is clear that somewhere between 2 and 4 feet of rise there is little assurance that the Delta can perform as a delivery network of fresh water to the South Delta pumps. Since the subject report acknowledges that 2.9 feet of sea level rise is likely under one of the scenarios studied by the International Panel on Climate Change (IPCC) by the end of the century, clearly the most important question to be addressed by DWR is to calculate at what level the Delta's levies cannot be relied upon. **The subject report does not do this and does not offer a qualitative discussion.**

The other major assumption underlying their quantitative calculations is that reservoir operations (that is, Oroville and Shasta) are not changed by climate change impacts. That this is an untenable assumption is apparent from the report's side study that shows under 3 different scenarios that peak discharge from the Feather River may be

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substantially altered. In fact, the most severe scenario carefully quantifies that peak discharge for a "15 year event" may be 2 ½ times the current estimate of a 15-year peak discharge. Clearly, any inquiring mind would wonder how reservoir operations might be affected by such a finding. Curiously, the report does not inquire further. But that may be the most intriguing finding of the report. If as a matter of hydrology peak discharges at any return level are 2 ½ times higher, such a finding would call into question the ability of the dams to function as designed. First, 2 1/2 times peak discharge would probably tax the design limits of dam spillways. Second, flood pools in reservoirs would have to be enlarged compromising water conservation objectives. Third, passage of discharges 2 1/2 times as large would undoubtedly cause havoc below the dams. None of this is addressed in the report even though that is where it should logically lead.

In conclusion, the report shows no scientific curiosity concerning the very likely first order impacts of climate change. The detailed quantitative analyses that are performed are totally irrelevant to what are the major questions that are posed by climate change. The report should candidly state that the most reasonable forecasts of what climate change might produce would seriously compromise the project, to the extent that the SWP may be obsolete in its current configuration within the current century. This is certainly a different tone than that conveyed by this report.

Specific Criticisms

1) The report still relies on CALSIM II as a reliable model to study the impacts of climate change. First, as we have so many times stated in the past CALSIM II is a fatally flawed model. It has not been calibrated and is not a true simulation model, as it is commonly referred to. Second, the indices that are use to drive the model in certain of its calculations are without scientific or practical merit. They provide the so-called simulation with perfect information of stream flows in advance of simulated operational decisions and the indices are highly distorted representations of the true stochastic nature of the operational problem, simulating operations in the face of uncertain future stream flows. It is particularly noteworthy that the CALSIM II run labeled "Base" in the report does not resemble the CALSIM II 2021-runs performed for the Reliability Report for ostensibly the very same assumptions. In fact, the variance between these two case studies, the "2021" study in the reliability report and the "Base" in the climate change study, is roughly the same as the differences reported between the "Base" case in the climate change study and the alternative scenarios. (See Table 1 below.) In stark terms, we are using a measuring instrument that is too imprecise to reliably distinguish differences among the scenarios. Scientifically, the model is inappropriate just on that finding and DWR staff should be required to establish why there are such differences between these two reports.

2) Throughout a significant portion of the report detailing previous hydrologic history of the Central Valley, there are many regression analyses results that are portrayed to establish certain trends that may have some significance. The report does not state why they may be relevant. I find it difficult to see any

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such relevance except if it is to acknowledge that some climate change may have already occurred. Even then, I fail to see the relevance absent any analysis that shows why it should be. Beyond that observation of relevance, there is the more important issue of deciding when a calculated trend is significant. It appears from the data presented in the report that many of the trends are statistically insignificant at normally accepted thresholds. Why such trends are reported as maybe "real" is puzzling.

3) The preoccupation with the affects of climate change on stream flow temperatures is probably misplaced. Given that current project operations are decimating species in the Delta, the concern seems an attempt to show that the species are doomed anyway and we shouldn't worry about what the projects are doing now. That is a very shortsighted view and seems to be extremely self-serving with respect to current operations. My view would show more emphasis on characterizing future overall stream flow amounts and timing rather than on speculations on stream-flow temperatures as if the basic stream flows are relatively unperturbed.

4) The report does provide a fairly decent summary of the extant scientific theories supporting global warming and the effects on climate. The report depends most strongly on the work reported by the IPCC and the scenarios they cast. However, other more recent work out of the Goddard Space Science Institute (GSSI) strongly suggests that ice sheet breakup of the Greenland and/or Antarctic ice sheets may accelerate sea level rise significantly, an event that is not a major factor in the IPCC scenarios. If the GSSI theory is more correct the integrity of the Delta in the nearer future may be in doubt. Neither the IPCC nor the GSSI can offer precise timelines as to when significant sea level rise may occur. Nonetheless, it is vitally important that DWR include a candid appraisal of the likelihood of sea level impacts on the Delta beyond the mere 15-inch rise assumed in their studies. Calculations can easily show that the generally accepted existing level of climate forcing, .85 watts/m^2, is sufficient to melt sufficient ice to raise sea level by 0.4 feet per year. What is not certain is how future climate forcing will divide between melting ice and warming the biosphere. It is very clear right now that the rate of sea level rise cannot be estimated precisely but the potential for rapid sea level rise is the most important feature of global warming. The report should candidly state so.

5) The report summarizes the past history that has been developed for global warming over the past 650,000 years which shows that within our recorded history the Earth is near a peak warm temperature for this interval. If the report had included the corresponding data on the coincidence of greenhouse gas concentrations and sea levels with temperature (See attachment) it would be quite clear that greenhouse gases are the most significant driver of temperature change and consequent sea level rise. The DWR report does include a table of the existing concentrations of CO_2 and methane,

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corroborated in the attachment, which are higher than ever measured by the ice cores within the past 650,000 years. This remarkable finding should require the widest possible range of possible changes rather than the restricted ranges chosen by the report. In short, the authors of the report did not delve deeply enough into the current research being performed on climate change and the report cannot claim to have met its objective of "incorporating climate change into the SWP."

6) The analysis to incorporate climate change into CALSIM II involves an intricate attempt to translate IPCC climate change scenarios into specific quantitative changes in major Northern California river run-off as the basis of the computer calculations that form the major effort of the report. It is noted in the analysis that the climate change scenarios are based on global models that incorporate only six grid points to characterize expected rainfall for all of California. The analysis then proceeds to use the information developed for these six grid points to generate estimated changes for 10 of the major rivers. Another model, the Variable Infiltration Capacity (VIC) model, is used to calculate these estimated changes of rainfall into run-off. An important assumption in this exercise is the use of the VIC model to develop perturbation ratios due to climate change that can then be used to modify the characteristic run-off measurements for these rivers. The clear flaw in this methodology is the measured run-off used to characterize the rivers. The analysts chose the year 1976, a readily acknowledged drought year to characterize the average or "normal" run-off. Since 1976 was well below average for any river system in California, this choice necessarily biases the estimated changes low. 1976 run-off was probably less than half the average. Therefore, on translating changed rainfall into estimated run-off for the major rivers feeding the CVP and SWP, the use of 1976 as a basis to scale from as described in the report necessarily underestimates the run-offs under climate change by a significant amount. Accordingly, the entire exercise with the Delta model, DSM, is not even a reasonable estimate. Since this computer exercise seems to comprise the most substantive portion of the report, it calls into question any and all of its findings. DWR should be required to justify the choice of 1976 (although on its face it seems that this can't be done). A standard analysis of this type would have done so as a matter of course.

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Table 1
Comparison of "Base" and 2021 CALSIM II Runs

(Million acre-feet per year)

Water Year	Climate Change Report SWP Exports	2002 Reliability Report SWP Exports Fixed Demand	Variance
76	2.97	2.78	.19
77	1.00	0.83	.17
78	3.61	3.91	.30
79	3.70	3.49	.21
80	4.10	3.46	.64
81	3.33	3.40	.07
82	4.71	4.13	.58
83	3.68	4.13	.45
84	3.42	4.10	.68
85	3.52	3.32	.20
86	4.20	3.01	1.19
87	2.57	2.84	.27
88	1.54	0.99	.55
89	2.72	2.90	.18
90	1.60	1.15	.45
91	1.10	1.00	.10
Average Variance			**0.39**

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california water impact network

Caroline K. Krieger president
Dorothy Green secretary
Joan H. Wells treasurer
Melinda Choulnard director
Yvon Choulnard director
Hap Dunning director
Michael Jackson director
Huey Johnson director
Imaging Spence director

attachment #16 (3 pgs)

ENV-28

October 25, 2005

Castaic Lake Water Agency
Mary Lou Cotton
27234 Bouquet Canyon Road
Santa Clarita, CA 91350
FAX: (661) 297-1611

Re: Draft 2005 Urban Water Management Plan

This draft UWMP is to fulfill CLWA's requirement to be eligible for the California Department of Water Resources (DWR) administered State grants and loans and drought assistance.

ISSUES:

1. **Water Reliability**

CLWA is relying on the Working Draft 2005 SWP Delivery Reliability Report and strangely, "percentages for Table A deliveries under different hydrologic conditions from DWR's "Excerpts from Working Draft 2005 SWP Delivery Reliability Report." But CLWA does not go into what those "different hydrologic conditions" might be. This is very confusing. If the 2005 Draft DWR Reliability Report is like its predecessor, the 2002 DWR SWP Water Reliability Report, then there is still a lot of "paper water" in the system. "Paper water" is water that exists as "a hope and a prayer" (to quote the Third District Court of Appeal in the PCL Monterey case) because the original SWP contracts had allocations of up to 4.23 million acre feet yet the reality is that the average actual annual delivery between 1990 and 2000 was a mere 1.86 million acre feet.

We believe that it is very inappropriate for CLWA to be using the Working Draft 2005 SWP Delivery Reliability Report when it is NOT available to the public. I called DWR in August and was told that it will not be available to the public for some months.

The 2002 SWP Water Delivery Reliability Report is also misleading because it makes it appear that SWP is 76% reliable for development purposes. This is false and must be corrected to reflect the historic reliability of the SWP. **The SWP has promised to deliver 4.23 MAF a year. In reality, between 1990 and 2000, the SWP actually delivered only 1.86 MAF a year.** This is hardly 76%; it is actually under 50%.

CALSIM II is the computer model upon which DWR bases its water reliability report. The peer review document of the DWR Water Reliability Reports, the December 4, 2003 "A Strategic Review of CALSIM II and its Use for Water Planning, Management, and Operations in Central California" is highly critical of the CALSIM II model and therefore this model should not be relied upon as factual. The peer review document needs to be considered when the actual numbers are calculated for planning and development purposes when SWP water is being considered as a water source. The biggest problem with the CALSIM II model as I understand it, is that it takes groundwater as an unlimited resource. This leads to a false impression of what water is actually available. I have attached a recent critique of CALSIM II for the record.

P.O. Box 5462, Santa Barbara, CA 93150, email: caroleekrieger@cox.net, Phone: 805.969.6824, Fax: 805.565.3394

1

Global warming must be taken into consideration when calculating water reliability in California. Global warming has not been factored in to the reliability of the water supply being considered. The consensus of scientists who are studying global warming concludes that it will snow less, rain more and the snow will melt sooner giving us a rush of water in the Spring rather than the snow pack acting as a reservoir as it has in the past. C-WIN incorporates "Emissions Pathways, Climate change, and Impacts on California"; see attached.

Now, with the recent 3rd District Court of Appeal decision, the RCRC decision (JCCP No. 4152) setting aside the CALFED EIR and overturning the CALFED ROD because of the failure of the CALFED EIR to analyze sending less water south of the San Francisco Delta, it is imperative for CLWA to be cautious in reporting the SWP reliability; see attached.

2. 41,000 AF Water Transfer from Kern County Water Agency to CLWA is NOT final; several court cases exist regarding this transfer

CLWA is relying on the transfer of 41,000 AF of agricultural water allocation from the Kern County Water Agency that is currently under litigation. Without the DWR Monterey Plus EIR being final, and with the current litigation, CLWA should not be citing 95,200 AF as its "firm" SWP allocation.

CLWA should be using 54,200 AF not 95,200 AF as its Table A Allocation.

3. SWP Contract Articles 18 (a) & (b) issues

CLWA is a municipal water agency and a great deal of its imported water is coming from the State Water Project. Much of this imported water is being relied upon for building housing units in the Newhall Land and Farming area. The 41,000 AF of proposed transfer water from the Kern County Water Agency is agricultural, and DWR has not finalized the Monterey Plus EIR, therefore it is imperative that this draft UWMP wait until the Monterey Plus EIR becomes final before counting on the 41,000 AF water transfer. Article 18(a) of the SWP water contracts requires that agriculture take the first cut backs in SWP deliveries during drought years. This is a very important safe-guard for municipal water supplies. Article 18(b) states that DWR will only promise what it can actually deliver on a long range basis, thus eliminating "paper water", water that really doesn't exist. One of the most contentious parts of the PCL Monterey litigation was the fact that implementation of Article 18(b) was never analyzed as an alternative.

4. Other Issues affecting proposed water transfers

The following are some, but perhaps not all, of the other issues affecting proposed water transfers:

a. Impacts from transferring area.
b. Water quality issues about putting pumped water back into the SWP aqueduct.
c. SWP aqueduct carrying capacity.
d. How does this affect the negotiations on the Monterey Plus EIR?

All of these questions must be dealt with before CLWA can rely on such big numbers for water availability in the 2005 draft UWMP.

C-WIN hereby incorporates all other comments by reference opposing the proposed CLWA Draft 2005 UWMP. For the above reasons, C-WIN requests that this Draft UWMP rely only on 54,200 AF of SWP as their Table A amount and that because of serious critique of the SWP Water Delivery Reliability Report, that this 54,200 AF be relied on only at half its face value. The

2

existing "paper water" must be removed from the system to protect the people who already live in the CLWA service area.

Sincerely,

Carolee K. Krieger

Carolee K. Krieger
President, C-WIN
808 Romero Canyon Road
Santa Barbara, CA 93108
PH: (805) 969-0824

Attachments: 1. "Emissions Pathways, Climate Change, and Impacts on California", August 24, 2004
2. San Francisco Estuary & Watershed Science, March 2005 "Musings on a Model: CALSIM II in California's Water Community
3. 3rd District Court of Appeal decision JCCP No. 4142

3

attachment
#17
(10 Pgs)
ENV-28

October 21, 2005

Mary Lou Cotton
Water Resources Manager
CLWA
27234 Bouquet Canyon Road
Santa Clarita, CA 91350
Fax: 661/297-1611

Re: Castaic Lake Water Agency Draft 2005 Urban water Management Plan

Ms. Cotton,

The Planning and Conservation League submits the following comments to the Castaic Lakes Water Agency on the Draft 2005 Urban Water Management Plan.

PCL engaged and prevailed in *Planning and Conservation League v. Department of Water Resources* (2000) 83 Cal.App.3d due to concerns that over reliance on future increased State Water Project delivery levels was equivalent to reliance on paper water. The court's decision in *PCL v DWR* held that in fact reliance on water that does not exist is indeed a serious threat to California.

This Draft 2005 Urban Water Management Plan (draft UWMP) contains serious flaws, including inappropriate use of draft data from the Department of Water Resources, inappropriately accounting of transfer water and inappropriate reliance on infeasible water supplies. Together these flaws result in potentially significant overstatement of supply equivalent to reliance of paper water.

Because of the importance as a base planning document, it is vital that the CLWA ensure the information provided in the draft UWMP is accurate and reliable. CLWA has a responsibility to its customers to ensure that the following flaws are addressed prior to issuing the final UWMP.

1

The Urban Water Management Plan inappropriately relies on the Draft 2005 Delivery Reliability Report information provided as draft material to water contractors.

The credibility of the draft UWMP is greatly compromised due to significant reliance on incomplete and inaccessible draft information. The draft UWMP projections of future water supply availability are based on a single draft chapter of the working draft 2005 Reliability Report prepared by the Department of Water Resources. The complete Draft Reliability Report including the assumptions behind the reported water supply delivery reliability have not been reviewed or released to the public. Without the complete report, neither the public nor CLWA can accurately discern the credibility of the information included in the Reliability Report. Water supply information from one chapter of a draft report does not provide an adequate level of certainty or rigorous review required to determine the reliability of future water supplies for the residents of the Castaic Lake Water Agency service area.

Accordingly, it is inappropriate to finalize the draft UWMP until the complete Draft Reliability Report is made available to CLWA and the public, and until sufficient time has been provided for the CLWA and public to review and confirm the validity of the information provided in that document.

The draft UWMP fails to recognize or report uncertainty and risk associated with water supply. This failure results in overly confident statements of water supply availability.

The UWMP inappropriately relies on the CALSIM II model.

Most of the water supply identified in the draft UWMP is SWP water supply. The UWMP lists SWP supplies as precise amounts, rather than a range of possible supplies based on uncertainty. These precise predictions of SWP water availability to CLWA and its purveyors are based on DWR calculations that use the CALSIM II model.

A recent peer review of the CALSIM II by the California Bay Delta Water Authority Science Program found several major deficiencies in the model and determined that CALSIM II is unfit to determine absolute predictions for water reliability.

Furthermore, the peer review found that the CALSIM II model has not been calibrated or validated. The peer review states:

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> In our opinion CALSIM II has not yet been calibrated or validated for making absolute predictions values. Yet it is apparent that there has been a distinct need by model users for absolute predictions. In the absence of alternatives, users are adopting CALSIM II results as the best absolute prediction available and they are likely to continue to do so. We recommend that model developers recognize the requirement for CALSIM II to provide absolute predictions. To satisfy this new purpose, additional calibration of the model will be required to ensure that the output it produces is fits for this purpose. Regardless of how possible it is to match the model closely with observed behavior, statistics on the accuracy of the calibration run should be supplied to users to enable them to gauge the likely errors involved with using the model output.[i]

The peer review also states, "… procedures need to be developed to enable the estimation of measures of uncertainty associated with the model output."[ii]

Without calibration, use of the CALSIM II model likely overstates delivery capability of the State Water Project to contractors, including CLWA. The CALSIM II model produces estimates of deliveries based on optimization calculations. An optimization model can be used to determine a set of actions from a range of possibilities that could obtain a preferred outcome. However, the CALSIM II model optimizes the outcome, water exports and deliveries, without a realistic review of whether the actions needed for that outcome are realistic or possible.

The Bay-Delta Authority peer review states, "However unless the optimization is calibrated in such a way as to actually resemble what takes place in practice it can produce an optimistic description of system performance. This is particularly true if the optimization model is allowed to have perfect foresight of future events that in practice would not be available to system operators."[iii]

Such is the case with the CALSIM II model, where optimal outputs are produced with little regard as to whether those outputs can be implemented. The model does not take into account many limitations (i.e. reduced storage resulting from reduced snowpack, reduced reliability of water from the Bay Delta due to , etc.) resulting from impacts of global warming.[iv] The model assumes no upper bound for groundwater pumping from the Sacramento Valley. This assumption does not reflect reality, and allows more water to be exported from the Sacramento Valley than is realistic.[v] Therefore, it is likely that

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CALSIM II projected water deliveries based on actions that will not in reality be available to system operators.

The peer review concludes, "Most successful applications of optimization that attempt to simulate the behavior of a system have calibrated their functions (i.e., set the weight that prioritize flows over time and space) so that the model results correspond to what actually happens or would happen under a particular hydrologic and demand scenario. In these cases the model's decisions correspond to those the operator would make, as often prescribed by the rules that have been worked out in a legal/political process. It does not appear that such calibration of the objective function weights in CALSIM has yet been completed."[vi]

For the reason described above, the CALSIM II model is not capable of producing absolute predictions, and therefore the CALSIM II outputs should not be used as absolute predictions for water supplies in the draft UWMP.

In addition to use of the CALSIM II model, the UWMP fails to acknowledge impacts of climate change including reduced reliability of the State Water Project.

The majority of water identified in the Draft UWMP will come from the State Water Project. DWR and climate change experts have concluded that climate change is having and will continue to have a significant impact on the State Water Project, including the ability to deliver water to contractors.

Currently the State Water Project depends on snowmelt to refill reservoirs and provide SWP water during over the year. However, with decreasing snowpack, water available to SWP may be significantly reduced. DWR's April 7, 2005 Public Review Draft of the California Water Plan Update states:

> California's relies on snowpack as its largest means of annual water storage. Runoff from the Sierra Nevada mountains during April through July of each year averages 14 million acre-feet and comes primarily from snowmelt. Computer modeling of global climate change scenarios predict significant future reductions in the Sierra snowpack. A reduced snowpack will reduce the total water storage for the state. Figure 4-7 (Model simulation of potential changes in snowpack during the 21st Century) shows a 52 percent reduction in the annual April through July runoff for a 2.1 degree C (3.8 F)

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> of warming, well within the 1.4 to 5.8 degree C (2.5–10.4 F) range predicted by global climate models for this century.[vii]
>
> Changes in the timing of snowfall and snowmelt, as a result of climate change, may make it more difficult to refill reservoir flood control space during late spring and early summer, potentially reducing the amount of surface water available during the dry season. Changes in reservoir levels also affect lake recreation, hydroelectric power production, and fish habitat by altering water temperatures and quality. Reductions in snowpack may require changes in the operation of California's water systems and infrastructure, and increase the value of additional flood control space in reservoirs.

In addition to reduced water availability, climate change will likely reduce the ability of the SWP to physically deliver water. The SWP conveys water from Northern California through the low-lying Bay-Delta Estuary. SWP export facilities in the Bay Delta are protected from salt water intrusion by Bay Delta levees. However, as sea level rises with expected climate change, Bay Delta levees are more prone to failure. This uncertainty is documented in the Draft California Water Plan Update:

> Global climate change is already leading to sea level rise. Figure 4-9 (Golden Gate annual average and 19-year mean tide levels) shows historical sea level rise at the Golden Gate. During the 20th century, sea levels increased by 0.2 meters (0.7 feet). Models project a median rise of 0.5 meters (1.6 feet) over the 21st century due to climate change (IPCC 2001). Sea level rise could eventually disrupt ecosystems and communities in coastal areas and disrupt ongoing tidal wetland restoration efforts. The biggest impact of sea level rise on California's water supply and tidal wetlands restoration efforts could be in the Sacramento-San Joaquin River Delta. Sea level rise would increase pressure on Delta levees that protect low-lying lands, much of which are already below sea level. A single-foot rise in sea level would increase the frequency of the current 100-year peak high tide in the western Delta to about a 10-year event. Another effect of sea level rise is increased salinity intrusion from the ocean, which could degrade freshwater supplies pumped from the Delta unless more freshwater from upstream reservoirs is released to push back intruding sea water. Sea level rise could also threaten coastal aquifers.[viii]

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The draft UWMP fails to account for the potential impacts listed above to future water supplies. The final UWMP should indicate how CLWA and the other water purveyors preparing the UWMP intend to analyze and address the impacts of climate change. Los Angeles Department of Water and Power has included such an analysis in its UWMP.[ix]

The draft UWMP inappropriately identifies 41,000 acre feet of water supply from an unapproved and legally challenged transfer from Kern County Water Agency to CLWA.

The draft UWMP that CLWA's current total SWP Table A amount is 95,200af, which includes 41,000 af of water transferred from Kern County to CLWA as part of the Monterey Amendments. However, as CLWA is aware, this 41,000 af transfer cannot be considered final until the Monterey Plus EIR has been completed.

We bring to your attention the Monterey Settlement Agreement, to which Castaic Lake Water Agency is a signatory. This Agreement precludes reliance on the 41,000AF transfer and on projects approved after March 26, 2001 until the new Monterey agreement EIR is completed.

Per the Court Order filed June 6th, 2003, item 4:

> As part of the Settlement Agreement, DWR and the SWP Contractors who are signatories to the settlement agreement have agreed that, pending DWR's filing of a return in satisfaction of the Writ of Mandate and this Court" dismissal of the Writ of Mandate, they will not approve any new project or activity (as defined in Section VII.A of the Settlement Agreement) in reliance on the 1995 Environmental Impact Report for the Implementation of the Monterey Agreement.

Castaic Lake Water Agency has purported to prepare a new EIR for that transfer, but that EIR is legally inadequate, and both the Court of Appeals' decision in the Monterey Amendments litigation and the Monterey Settlement Agreement preclude Castaic Lake Water Agency serving as the lead agency for the new EIR for the 41,000 af transfer. It is indisputable that DWR's new Monterey Amendments EIR is not complete. Therefore, the transfer cannot be relied upon as a water supply, and that water supply does not meet the legal test found in Senate Bill 221 (Government Code Section 66473.7 (d).

Stating that the 41,000 af transfer is final represents a significant overstatement of supply. This overstatement significantly decreases the reliability of water supplies for both future

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and current residents of the CLWA service area. If, for example, the 41,000 af transfer were overturned in court or did not survive the statewide review of the "Monterey Plus" project, the amount of that surplus, and the water available to the CLWA service area, would be dramatically affected. For these reasons, it is inappropriate for the draft or final UWMP to infer that CLWA's Table A apportionment includes the disputed 41,000 af.

The draft UWMP identifies unrealistic and infeasible future water supplies.

The draft UWMP states that CLWA will pursue investments in future development of several desalination projects in exchange for State water Project Water. This proposal is speculative, infeasible and unlikely to occur. Most of the desalination projects listed in the draft UWMP are being pursued in areas that are not connected to the State Water Project system and do not receive SWP water. Therefore, exchange, even through a third party would be physically impossible. Significant infrastructure would be required tin order to make such an exchange possible. However, there are no current proposals or plans to build such infrastructure. In addition, for most of the desalination projects identified in the draft UWMP, the local water purveyors pursuing desalination have planned to continue to use any surface water supplies plus the yield of the desalination facility. Therefore, these projects will not produce extra water for exchange to CLWA. In addition, there is no history of a successful transfer of coastal desalination water in exchange for existing SWP supplies. The regulatory framework under which this type of exchange could be possible has not been established. Thus, there the feasibility of such a transfer is questionable. Reliance on desalination in the CLWA service area is purely speculative. Thus, these supplies should not be included in the final UWMP.

The significant issues identified above should be addressed prior to issuance of the final UWMP.

Thank you,

Mindy McIntyre

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[i] A Strategic Review of CALSIM II and Its Use for Water Planning in Central California. California Bay-Delta Authority Science Program, December 2004., p 9
http://calwater.ca.gov/Programs/Science/adobe_pdf/CALSIM_Review.pdf
[ii] A Strategic Review of CALSIM II and Its Use for Water Planning in Central California. California Bay-Delta Authority Science Program, December 2004., p 10
http://calwater.ca.gov/Programs/Science/adobe_pdf/CALSIM_Review.pdf
[iii] A Strategic Review of CALSIM II and Its Use for Water Planning in Central California. California Bay-Delta Authority Science Program, December 2004., p 4
http://calwater.ca.gov/Programs/Science/adobe_pdf/CALSIM_Review.pdf
[iv] Final State Water Project Delivery Reliability Report 2002. Department of Water Resources, B-1.
http://swpdelivery.water.ca.gov/SWP%20Delivery%20Reliability.final.2002.pdf
[v] A Strategic Review of CALSIM II and Its Use for Water Planning in Central California. California Bay-Delta Authority Science Program, December 2004., p 26
http://calwater.ca.gov/Programs/Science/adobe_pdf/CALSIM_Review.pdf
[vi] A Strategic Review of CALSIM II and Its Use for Water Planning in Central California. California Bay-Delta Authority Science Program, December 2004., p 5
http://calwater.ca.gov/Programs/Science/adobe_pdf/CALSIM_Review.pdf
[vii] April 7, 2005 Public Review Draft of the California Water Plan Update, Vol. 4, page 4-27
[viii] April 7, 2005 Public Review Draft of the California Water Plan Update, Vol. 4, page 4-28
[ix] Los Angeles Department of Water & Power Draft 2005 Urban Water Management Plan, page 102

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October 26,2006

Mary Lou Cotton
Water Resources Manager
CLWA
27234 Bouquet Canyon Road
Santa Clarita, CA 91350
Fax: 661/297-1611

Re: Planning & Conservation League Supplemental Comments on the Castaic Lake Water Agency Draft 2005 Urban water Management Plan

Ms. Cotton,

The Planning and Conservation League submitted comments on the Draft 2005 Urban Water Management Plan to the Castaic Lakes Water Agency (CLWA) on October 21, 2005 (see attachment A). The following comments are submitted to supplement our previous comments.

PCL's previous comments identified several flaws in the draft UWMP. Primary among these flaws was the inappropriate inclusion of 41,000 acre feet of water supply from an unapproved and legally challenged transfer from Kern County Water Agency to CLWA. The draft UWMP assumes the 41,000 af transfer to be a component of CLWA's State Water Project (SWP) contract amount. However, the 41,000 af transfer of SWP contracted amount is contingent on completion of the Monterey Plus EIR and resolution of pending superior court actions by the Planning and Conservation League and California Water Impact Network contesting both the finality of the transfer and Castaic's most recent EIR. The Planning and Conservation League has repeatedly notified CLWA of legally inappropriate reliance on this transfer. We now re-submit several letters written by PCL on this matter and request full consideration of this material prior to approval of the draft UWMP (see attachments B, C, D, E and F) . In accordance with the above comments and the attached letters, CLWA is urged to remove the 41,000 af transfer from the SWP contract amount cited in the draft UWMP.

Thank you ,

Mindy McIntyre
Water Policy Specialist

9

Planning and Conservation League

Attachments:
Attachment A: PCL comments to CLWA on the draft Urban Water Management Plan, October 21,2005
Attachment B: PCL letter dated August 16, 2004 to Mary Lou Cotton
Attachment C: Rossmann & Moore letter on behalf of PCL dated March 28, 2003 addressed to Delores Brown
Attachment D: Rossmann & Moore letter on behalf of PCL letter dated February 3, 2004 addressed to Daryl Koutnik
Attachment E: Rossmann & Moore letter on behalf of PCL dated March 1, 2004 addressed to Ms. Hsio-ching Chen
Attachment F: Rossmann & Moore letter on behalf of PCL dated May 4, 2004 Jeff Hogan, Associate Planner

10

california water impact network

March 8, 2006

attachment #18 (4 pgs) ENV-28

Carolee K. Krieger president
Dorothy Green secretary
Joan H. Walk treasurer
Melinda Chouinard director
Yvon Chouinard director
Hap Dunning director
Michael Jackson director
Huey Johnson director
Imaging Sperco director

Board of Directors
Newhall County Water District
PO Box 220970
Newhall, CA 91322
FAX: 661-259 9673

RE: SB 610 Water Supply Assessment for Gates King Project

To the Board;

C-WIN strongly urges you not to approve the SB 610 Water Supply Assessment for the Gates-King Project as it is based on water supply assessment documents that are flawed and currently being challenged in court. These documents include, but are not limited to, CLWA's 2005 Urban Water Management Plan (UWMP) and DWR's Draft SWP Water Delivery Reliability Report 2005. This Water Supply Assessment is also relying on a 41,000 acre foot transfer of permanent Table A Allocation from the Kern County Water Agency that is not finalized and is currently in litigation.

We believe that these documents and the purported water transfer are further compromised by recent court rulings that include the October 2005 ruling by the 3rd District Court of Appeal overturning the CALFED Record of Decision; the 2nd District Court of Appeal ruling, known as the California Oak Foundation ruling that overturned the Gates-King EIR because it was based on the illegal 41,000 AF water transfer from Kern County; the February 9th, 2006 3rd District Court of Appeal ruling in which Golden Gate Audubon prevailed and the court ordered that existing salinity standards in the Bay Delta be upheld; and the subsequent Order by the State Water Resources Control Board (SWRCB) requiring DWR and the CVP to shut down their pumps if the salinity standards are not met which means that more water must be left in the San Joaquin River and the Bay Delta and therefore there is less water to pump to southern California.

Because of the recent realization that several species of fish in the Bay Delta including the delta smelt, split tail, winter run salmon and several others, are on the verge of extinction and that a very likely cause of that problem is over pumping in the Delta, it is very important for developers in southern California to start making the connection that there is very likely to be less water in the SWP and the CVP available to them. Global warming also exacerbates this problem.

The recent attempts by the SWP and the CVP to pump up to 27% more water out of the Bay Delta as part of what is known as the South Delta Improvement Project (SDIP) is soundly critiqued by the California Sportfishing Protection Alliance (CSPA) in their comments submitted to DWR February 7, 2006 (see attachment 1.)

Further more, it is not prudent to plan on building structures that will be here for many many years on a water supply document that states in the last page, "This WSA shall expire and be of no further force and effect on March 9, 2009.

P.O. Box 5462, Santa Barbara, CA 93150, email: carpleekrieger@cox.net, Phone: 805.969.0824, Fax. 805.565.3394

ISSUES:

1. **Water Reliability**

CLWA is relying on the **Draft 2005 SWP Delivery Reliability Report** which is still full of "paper water" and relies on the illegal 41,000 AF water transfer from the Kern County Water Agency. "Paper water" is water that exists as "a hope and a prayer" (to quote the Third District Court of Appeal in the PCL Monterey case) because the original SWP contracts had allocations of up to 4.23 million acre feet yet the reality is that the average actual annual delivery between 1990 and 2000 was a mere 1.86 million acre feet. The 2005 draft Reliability Report makes it appear that 77% of the SWP Table A Allocation is available for development purposes. Page 6 of the SB 610 Water supply Assessment Report states that **"This updated analysis indicates that the SWP, using existing facilities operated under current regulatory and operational constraints, and with all contractors requesting their full Table A Amounts in most years, could deliver 77 percent of total Table A Amounts on a long-term average basis."** Given actual historical average deliveries when the SWP contractors were requesting as much as they could get, DWR could not even deliver 50 percent. **The SWP has promised to deliver 4.23 MAF a year. In reality, between 1990 and 2000, the SWP actually delivered only 1.86 MAF a year.** This is hardly 77%; it is actually under 50%. It is critical for land-use planners to have a document that is clear about what actual, wet water is available.

I have attached the December 19, 2005 comments on the deficiencies of the 2005 SWP Reliability Report submitted by Physicist and Systems Analyst Arve Sjovold (attachment 2). I have also attached the December 22, 2005 comments on the deficiencies of the 2005 SWP Reliability Report by PCL Water Program Manager Mindy McIntyre (attachment 3).

The 2002 SWP Water Delivery Reliability Report is also misleading because it makes it appear that SWP is 76% reliable for development purposes. This is false and must be corrected to reflect the historic reliability of the SWP.

CALSIM II is the computer model upon which DWR bases its water reliability report. The peer review document of the DWR Water Reliability Reports, the December 4, 2003 "A Strategic Review of CALSIM II and its Use for Water Planning, Management, and Operations in Central California" is highly critical of the CALSIM II model and therefore this model should not be relied upon as factual. The peer review document needs to be considered when the actual numbers are calculated for planning and development purposes when SWP water is being considered as a water source. The **biggest problem with the CALSIM II model as I understand it, is that it takes groundwater as an unlimited resource.** This leads to a false impression of what water is actually available. I have attached a recent critique of CALSIM II for the record, "Musings on a Model: CalSim II in California's Water Community", 3/05 (attachment 4.)

More recently, "An Environmental Review of CalSim II" by Jeffrey T. Payne and David R. Purkey, November 2005, concludes "...we are left with the profound impression that it (CalSim II) is not a tool that can - under its current formulation – fully address the legally required water management objectives. CalSim II holds that the environment is a constraint on system operations, not one of the objectives for which the system should be managed." (See attachment 5.) Also attached is a critique of CalSim II by Jan de Leeuw, Distinguished Professor and Chair CLA Department of Statistics, dated October 23, 2005 (attachment 6.) I have also attached three comment letters concerning the CalSim II modeling by Arve Sjovold; "Some Insights on Water Deliveries to Settlement Contractors", October 24, 2004 (attachment 7; "On the Adequacy of

2

CalSim II for Environmental Impact Analysis and SWP Reliability Analysis", August 12, 2004 (attachment 8); and "Response to Director Gerald Johns Letter on CalSim II", October 2, 2005 (attachment 9.) All of these documents clearly lay out the problems for anyone who wants to rely on CalSim II as the predictor of reliability for the SWP.

Global Warming must be taken into consideration when calculating water reliability in California. Global warming has not been factored in to the reliability of the water supply being considered. The consensus of scientists who are studying global warming concludes that it will snow less, rain more and the snow will melt sooner giving us a rush of water in the Spring rather than the snow pack acting as a reservoir as it has in the past. C-WIN incorporates "Emissions Pathways, Climate change, and Impacts on California" (attachment 10.).

Now, with the recent 3rd District Court of Appeal decision, the RCRC decision (JCCP No. 4152) setting aside the CALFED EIR and overturning the CALFED ROD because of the failure of the CALFED EIR to analyze sending less water south of the San Francisco Delta, it is imperative for CLWA to be cautious in reporting the SWP reliability (attachment 11.)

2. 41,000 AF Water Transfer from Kern County Water Agency to CLWA is NOT final; several court cases exist regarding this transfer

CLWA is relying on the transfer of 41,000 AF of agricultural water allocation from the Kern County Water Agency that is currently under litigation. Without the DWR Monterey Plus EIR being final, and with the current litigation, CLWA should not be citing 95,200 AF as its "firm" SWP allocation.

Page 8 of the SB 610 Water Supply Assessment states, "The Monterey Amendments Settlement Agreement expressly authorizes the operation of the SWP in accordance with the Monterey amendments, which authorize the transfer (the 41,000 AF transfer)." This is blatantly not true. The 41,000 AF transfer was specifically singled out as NOT final and still under the cloud of litigation; which is exactly where it still is.

CLWA should be using 54,200 AF not 95,200 AF as its Table A Allocation for SWP water.

3. SWP Contract Articles 18 (a) & (b) issues

CLWA is a municipal water agency and a great deal of its imported water is coming from the State Water Project. Much of this imported water is being relied upon for building housing units in the Newhall Land and Farming area. The 41,000 AF of proposed transfer water from the Kern County Water Agency is agricultural, and DWR has not finalized the Monterey Plus EIR, therefore it is imperative that this draft UWMP wait until the Monterey Plus EIR becomes final before counting on the 41,000 AF water transfer. Article 18(a) of the SWP water contracts requires that agriculture take the first cut backs in SWP deliveries during drought years. This is a very important safe-guard for municipal water supplies. Article 18(b) states that DWR will only promise what it can actually deliver on a long range basis, thus eliminating "paper water", water that really doesn't exist. One of the most contentious parts of the PCL Monterey litigation was the fact that implementation of Article 18(b) was never analyzed as an alternative.

4. Other Issues affecting proposed water transfers

The following are some, but perhaps not all, of the other issues affecting proposed water transfers:

a. Impacts from transferring area.

b. Water quality issues about putting pumped water back into the SWP aqueduct.
c. SWP aqueduct carrying capacity.
d. How does this affect the negotiations on the Monterey Plus EIR?

All of these questions must be dealt with before CLWA can rely on such big numbers for water availability in the 2005 draft UWMP.

C-WIN hereby incorporates all other comments by reference opposing the proposed SB 610 Water Supply Assessment for the Gates-King Project. For the above reasons, C-WIN requests that this Water Supply Assessment rely only on 54,200 AF of SWP as their Table A amount and that because of serious critique of the SWP Water Delivery Reliability Report, that this 54,200 AF be relied on only at half its face value. The existing "paper water" must be removed from the system to protect the people who already live in the CLWA service area.

Sincerely,

Carolee K. Krieger

Carolee K. Krieger
President, C-WIN
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Attachments:
1. "CSPA Comments on the South Delta Improvement Program, Draft EIS/EIR" by Bill Jennings, chairman and Executive Director, CSPA, 2/7/06
2. "Comments on the Draft SWP Reliability Report 2005" by Arve Sjovold, 12/19/05
3. "Comments on Public Review Draft of the SWP Delivery Reliability Report 2005" by Mindy McIntyre, PCL Water Program Manager, 12/22/05
4. San Francisco Estuary & Watershed Science, March 2005 "Musings on a Model: CALSIM II in California's Water Community."
5. "Some Insights on Water Deliveries to Settlement Contractors" by Arve Sjovold, 10/24/04
6. "On the Adequacy of CalSim II for Environmental Impact Analysis and SWP Reliability Analysis" by Arve Sjovold, 8/12/04
7. "Response to Gerald Johns' Letter on CalSim II", by Arve Sjovold, 10/2/05
8. "An Environmental Review of CalSim II" by Jeffrey T. Payne and David R. Purkey, 11/05
9. "Response to Gerald Johns' Memo" by Jan de Leeuw, 10/23/05
10. "Emissions Pathways, Climate Change, and Impacts on California", August 24, 2004
11. 3rd District Court of Appeal decision JCCP No. 4142

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March 9, 2006

Maria Gutzeit, President
Newhall County Water District & Board Members
PO Box 220970
Santa Clarita, Ca 91322-0970
VIA FAX (661) 259-9673

attachment #19 (5 pgs)

ENV-28

RE: SB 610 Water Supply Assessment for the Gate-King Project

Dear Ms. Gutzeit and Board Members,

The Planning & Conservation League, a plaintiff in the Monterey Settlement, strongly urges your Board NOT to approve the Water Supply Assessment for the Gate King Project. The Water Supply Assessment relies on flawed materials and includes false information. These flaws seriously call into question the reliability of the supplies for this project, and therefore, it is inappropriate to endanger the water supply of existing customers by approving this WSA.

The Planning & Conservation League has previously indicated our concern with the unreliable water supply for the Gate-King Project, and with the reliance on water supplies included in the Stetson Report that have not been fully realized. We now reiterate our concerns and resubmit our previous comments on the Gate-King water supply assessment and the Stetson Report (attached).

This WSA states, "The pending challenges to the EIR for the 41,000 afy transfer do not affect the reliability of the transfer amount, and it is still appropriate to include the transfer amount as part of CLWA's 95,200 afy Table A Amount, for the following reasons. First, the transfer was approved by DWR and completed 1999, and DWR has allocated and annually delivered the water in accordance with the completed transfer (WSA page 8)."

This statement is factually untrue. The Monterey Settlement Agreement, to which Castaic Lake Water Agency is a signatory superficially states that the 41,00 acre foot transfer is not completed. This Agreement precludes reliance on the 41,000 afy transfer and on projects approved after March 26, 2001 until the new Monterey agreement EIR is completed.

Per the Court Order filed June 6th, 2003, item 4:

As part of the Settlement Agreement, DWR and the SWP Contractors who are signatories to the settlement agreement have agreed that, pending DWR's filing of a return in satisfaction of the Writ of Mandate and this Court" dismissal of the Writ of Mandate, they will not approve any new project or

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activity (as defined in Section VII.A of the Settlement Agreement) in reliance on the 1995 Environmental Impact Report for the Implementation of the Monterey Agreement.

Castaic Lake Water Agency has purported to prepare a new EIR for that transfer, but that EIR is legally inadequate, and both the Court of Appeals' decision in the Monterey Amendments litigation and the Monterey Settlement Agreement preclude Castaic Lake Water Agency serving as the lead agency for the new EIR for the 41,000 AF transfer. It is indisputable that DWR's new Monterey Amendments EIR is not complete. Therefore, the transfer cannot be relied upon as a water supply, and that water supply does not meet the legal test of Government Code Section 66473.7 (d).

The WSA for this project also relies on the 2005 CLWA Urban Water Management Plan. PCL submitted comments on that document outlining several specific flaws, which we re-submit to you as an attachment to this letter. Primary among those flaws is the fact that the 2005 UWMP relies on draft information on SWP reliability provided by the Department of Water Resources in May 2005. NCWD should note that the draft information provided in May 2005 is not consistent with the information DWR subsequently included in its full draft of the 2005 Delivery Reliability Report in December 2005.

In addition, CLWA included the May 2005 draft materials in the UWMP without verifying the validity of the information included in the May 2005 draft material or the subsequent December 2005 complete draft. Both draft documents relied on flawed information. We submit to your Board our comments on the 2005 Draft SWP Delivery Reliability Report.

The WSA states that in NCWD's judgment the 2005 still provides the best available information regarding water supplies and demand projections. However, NCWD should be aware that the Draft Reliability Report is based on old information, including modeling based on historic rain fall assumptions. However, it is now recognized that future hydrology in California will not be like the past. Climate change is altering the timing and amount of rainfall in California. The DWR draft Reliability Report fails to include demand or reliability projections under expected impacts of climate change, even though that information is available. DWR has in fact modeled reliability and demands under climate change. The California Energy Commission has also modeled water supply reliability from the SWP under climate change (see PCL comments to DWR on the December Draft 2005). According to that information, deliveries from the SWP could be up to 1 million acre feet per year *less than* what was reported in the DWR's Draft Reliability Report. If the SWP deliveries are cut back by 1 million acre feet, NCWD would not receive the amount of water relied on in this WSA.

PCL has previously alerted NCWD to the flaws in the CALSIM II. The CALSIM II model still has not been calibrated or validated, and many other flaws remain as well. Both DWR's Delivery Reliability Report and CLWA UWMP rely on that faulty model. Given those flaws of the model, NCWD should not rely solely on the model results to determine whether actual supplies exist from the SWP for this Water Supply Assessment.

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The reliability of the SWP is also questionable given the fact that the SWP does not have a take permit to divert water from the Bay Delta Estuary under the California Endangered Species Act. On March 7th 2006, the California Sport Fishing Alliance notified DWR of their intent to sue DWR for operating the SWP in violation of CESA (see attached press release from CSPA). Under CESA, DWR is not permitted to take CESA listed species such as Delta smelt without a take permit. NCWD should note that DWR does not have such a permit, and therefore, DWR could be required to cutback pumping from the Bay Delta Estuary.

For these reasons, and for continued concerns about the quality and quantity of your local aquifers, we urge your Board not to approve the WSA for this project until these concerns have been addressed.

Thank you for consideration of these comments,

Mindy McIntyre

Attachments

CC: Newhall Water District Board Members
Attachments

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FOR IMMEDIATE RELEASE: March 7, 2006

For More Information: Bill Jennings, 209-464-5067, Cell 209-938-9053
Michael Lozeau, 510-749-9102, Cell 415-596-5318

CSPA ISSUES NOTICE OF INTENT TO SUE DEPARTMENT OF WATER RESOURCES FOR ILLEGAL TAKE OF ENDANGERED SPECIES

Today, Watershed Enforcers, the California Sportfishing Protection Alliance's new environmental law enforcement project, placed the California Department of Water Resources (DWR) on notice that it intends to sue DWR for violation of the California Endangered Species Act (CESA) unless the agency acts within 30 days to cease its illegal take of listed species at the main intake pumps for the State Water Project or obtain long-overdue authorizations from the California Department of Fish and Game (DFG) for incidental takes provided by CESA. The notice letter also includes DWR Director Lester Snow and four other administrators, acting in their official capacity.

The CESA prohibits any persons "taking" – including killing, possessing, or trapping – any threatened or endangered species unless specifically approved by DFG. CSPA's investigation found that, despite numerous agency findings, scientific studies and reports describing takings of threatened spring-run and endangered winter-run Chinook salmon and threatened Delta smelt, DWR failed to procure authorizations for such takes from DFG pursuant to the Fish and Game Code. These violations at DWR's Clifton Court Forebay, Skinner Fish Protection Facility and the Harvey O. Banks Pumping Plant have been ongoing for many years.

"It is outrageous that, during a period of crashing populations of salmon and Delta smelt, the agency responsible for annually killing many thousands of endangered species has failed to comply with the most basic requirements of state law to mitigate and protect those fish," said CSPA Executive Director Bill Jennings. "It is also incomprehensible that DFG, the state trustee agency charged with protecting fishery resources, has allowed DWR to continue to ignore CESA pursuant to a wink and backroom handshake," added Jennings.

In response to a 19 December 2005 Public Records Act request by CSPA, DWR admitted in a 11 January 2006 letter that it had no record of any consistency determinations or other authorizations from DFG addressing take of spring-run or winter-run Chinook salmon or Delta smelt at any of DWR's facilities. These admissions are consistent with the testimony by DWR Director Lester Snow and DFG Director Ryan Broddrick before the Delta Resources subcommittee of the Senate Committee on Natural Resources and Water in late 2005.

Section 2080 of the Fish & Game Code prohibits take of a listed species without a permit, pursuant to § 2081, or a consistency determination, pursuant to § 2080.1. An entity who has obtained an incidental take permit under the federal Endangered Species Act, 16 U.S.C. § 1531 *et seq.* (ESA) may request a consistency determination from DFG. However, the Director of DFG must make findings within 30 days that the federal ESA permit is "consistent" with the requirements of CESA. The minimum requirements of CESA go substantially beyond minimal

ESA requirements. For example, unlike ESA, CESA requires that impacts of any authorized incidental takes be minimal, fully mitigated, not jeopardize the continued existence of a species and that all measures be capable of successful implementation and adequately funded. Fish & Game Code § 2081(2),(3) and (4).

"If DWR cannot comply with CESA within 30 days, we will file suit to enforce the protections mandated for California's threatened and endangered salmon and threatened Delta smelt," said Michael Lozeau, an attorney for CSPA. "We owe it not only to the fish, but also the integrity of the Sacramento-San Joaquin Delta and its tributaries and all the Californians who depend upon it for their health and well-being."

DWR's State Water Project yearly pumps millions of acre-feet of water from the Sacramento-San Joaquin Delta for agricultural and municipal uses in Southern California. The project's powerful pumps cause reverse flows in the Delta and San Joaquin River and "take" some 58 species and hundreds of thousands of fish, many of which are listed as threatened or endangered. Recently, state and federal scientists have confirmed that populations of open-water fish in the Delta, including Delta smelt, longfin smelt, threadfin shad, young-of-the-year striped bass and their food supplies, have dropped precipitously. An increase in the level of water exports is suspected to be a significant contributor to the declines.

Although federal ESA permits have been issued, an independent CalFed expert panel recently concluded that the permits were not based upon "best available science" and the Inspector General of the U.S. Department of Commerce has found that the National Marine Fisheries Services violated its own procedural requirements in issuing the permits. Further, mitigation for export pumping is largely predicated on an Environmental Water Account that causes redirected impacts by killing other listed species.

Although the notice letter states that Watershed Enforcers does not intend to delay filing of a lawsuit at the end of the 30-day period, it offers to meet with DWR to discuss possibilities of resolving the dispute short of litigation. Two law firms, led respectively by attorneys Michael Lozeau and Andrew Packard represent CSPA in this action.

CSPA is a 501(c)(3) public benefit corporation established as an advocate for fisheries, habitat and water quality. It implements its mission by working within the administrative and regulatory processes and, where necessary, through litigation. Watershed Enforcers is the enforcement arm of CSPA.

1991 - started

Friant Dam (ESA)

Paper water in CVP pg 51-54

decision July 28, 2005

attachment #20 (7 pgs)

ENV-28

UNITED STATES DISTRICT COURT

EASTERN DISTRICT OF CALIFORNIA

NRDC v. Bureau of Rec.

NATURAL RESOURCES DEFENSE COUNCIL, et al.,

Plaintiffs,

v.

KIRK C. RODGERS, etc., et al.,

Defendants.

NO. CIV. S-88-1658 LKK

ORDER ON MOTION FOR SUMMARY JUDGMENT RELATING TO THE ENDANGERED SPECIES ACT

Federal District Court Eastern District of CA Sac Division

Pending before the court is plaintiffs' motion for summary adjudication as to liability on their claims relating to the Endangered Species Act ("ESA"), 16 U.S.C. §§ 1531 et seq.[1]

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[1] During the January 20, 2005 Status Conference, the parties represented to the court that it was in the interest of the parties to first resolve all the liability issues before turning to remedies. The parties also stated their preference that the court first resolve causes of action relating to liability under the Endangered Species Act before turning to the remaining causes of action. Consequently, this order covers only the plaintiffs' ESA claims, or causes of action four through six of the seventh amended complaint.

not in accordance with the law. Connor, 848 F.2d at 1457-58.[43] The court wishes to be clear, it may well be that some O&M activities could not be accounted for in the BiOp because they were unknown. The fact that extensive O&M activities was absolutely certain, however, requires that the activities be analyzed under § 7.

b. FWS's Use of Historical Average Water Deliveries

Plaintiffs contend that FWS's jeopardy opinion should be set aside on yet another ground. They argue that FWS consulted on an amount of water that is significantly less than what was authorized by the water contracts. They maintain that § 7 requires that the action agency consult, and that FWS render BiOps on the effects of the action that is actually authorized by the action agency. 50 C.F.R. §§ 402.02, 402.14.[44] The

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[43] In American Rivers v. United States Army Corps of Engineers, 271 F.Supp.2d 230, 255 (D.D.C. 2003), the court explained why segmented consultations do not conform to the the requisites of the statute:

> If FWS were allowed to apply such a limited scope of consultation to all agency activities, any course of agency action could ultimately be divided into multiple small actions, none of which, in and of themselves would cause jeopardy. Moreover such impermissible segmentation would allow agencies to engage in a series of limited consultations without ever undertaking a comprehensive assessment of the impacts of their overall activity on protected species.

[44] "Action" means all activities or programs of any kind *authorized, funded, or carried out*, in whole or in part, by Federal agencies in the United States or upon the high seas. Examples include, but are not limited to: (a) actions intended to conserve listed species or their habitat; (b) the promulgation of regulations; (c) the granting of licenses, contracts, leases, easements, rights-of-way, permits, or grants-in-aid; or (d) actions

record reflects that FWS failed to do so, instead consulting on approximately less than half of what was authorized in the long-term contracts.

Defendants maintain that the regulation is in the alternative, "*authorized, funded, or carried out*", and the agencies consulted on the amount of water actually to be delivered as determined by historic deliveries, i.e., "carried out." Even assuming that the regulation is in the alternative, the argument fails.

It is clear that the language "carried out" is retrospective, and thus is not relevant to the matter at bar, which is the consummation of contracts for the future delivery of water. Because the contracts are for future delivery, and the amount of water actually to be delivered will vary from year to year and is thus uncertain, the only alternative which applies is the amount of water authorized to be delivered by those contracts. Put another way, the contemplated action is the execution of the water contracts. That execution will authorize the delivery of water, but clearly the execution of the contracts will not, in itself, carry out that delivery. As I now explain, given this conclusion, the BiOp was inconsistent was the agencies' ESA duties.

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directly or indirectly causing modifications to the land, water, or air. 50 C.F.R. §402.02. The agencies must consult on the effects of "the action" and cumulative effects on the listed species or critical habitat. 50 C.F.R. § 402.14.

The Friant long-term contracts cumulatively authorized the Bureau to deliver more than 2.1 million acre-feet of water per year, for twenty-five years.[45] Rather than analyzing the effects of 2.1 million acre-feet of water delivery, FWS explained that its "effects analysis is conducted under the expectation that water will be delivered to CVP service contractors in quantities that approximate historic deliveries (1988 through 1997), as given in Appendix D of the November 21, 2000 programmatic long-term CVP contracts consultation." This assumption was made, the BiOp explained, because "delivery of full contract quantities is unrealistic." BORESA 040105. An examination of Appendix D reveals that the historic deliveries for the water districts at issue totaled over 850,000 acre-feet.[46] Further, Table 1.4, which is included in the 2001 BiOp and which lists the Friant Division and Cross Valley Water Contractors, puts the historic annual deliveries at 799,411 for the Friant districts and 53,574

[45] The BiOp states that "[f]ull entitlements" under the contract are 2,115,975 acre-feet for the Friant Division and 128,300 acre-feet for the Cross-Valley Division. BORESA 039991. However, as plaintiffs point out, FWS used several different figures in describing the full quantity of water to be delivered. In Table 1.4 of the BiOp, the "Total of All Entitlements" is listed as 2,141,475 acre-feet, BORESA 039994, and where the Opinion incorporates the contract quantities that were used in "Appendix D" of an earlier consultation, the total contract quantities exceed 2.18 million acre-feet. BORESA 040105; BORESA 047873. While these numbers vary slightly in the record, the court is satisfied that the full quantity of water authorized by the contracts exceeded 2.1 million acre-feet.

[46] Appendix D lists all the CVP Contractors, rather than just the CVP contractors involved in this dispute, but based on what the court can tell, the amount of water consulted on is somewhere between 850,000 and 950,000 acre-feet.

acre-feet for the Cross Valley Contractors. BORESA 039993-039995.

Even though it is unclear what the exact amount of the historic annual delivery was between 1988 and 1997 for all of the water districts at issue, it appears clear that the amount was approximately half of what the water districts were authorized to receive through the contracts. Simply put, FWS did not evaluate the effects of the entire authorized agency action. Significantly, on the same day that the FWS BiOp was issued, Frank Michny, of the Bureau of Reclamation, e-mailed an FWS scientist, that:

> Our view is that we are consulting on full contract amts for each district, recognizing that total deliveries in certain areas may be limited by OCAP. We will agree that we will consult on any BOR action that may affect listed species . . . If changing project description to above results in a J[eopardy] opinion I have been informed, "so be it."

FWS AR 08023996.[47]

Just hours before the FWS BiOp was to be issued, the Bureau's regional environmental officer explicitly told FWS that it was to consult on "full contract amts," yet FWS failed to do so. As discussed above, "biological opinions must be coextensive with the agency action." Connor, 848 F.2d at 1457-58 (9th Cir. 1988). There is no question that ESA requires that

[47] During oral argument on April 13, 2005, the court asked the parties which documents were considered part of the administrative record. Counsel for Federal defendants conceded that internal communications between the action agency and the consulting agencies, including e-mails and other memorandum, were to be considered part of the administrative record.

all impacts of agency action - both present and future effects - be addressed in the consultation's jeopardy analysis. Id. The fact that it was thought by FWS that "delivery of full contract quantities is unrealistic" and that "deliveries continue to be impacted by existing climate, hydrology, actions and statutes, . . . socio-economic factors" does not excuse consulting on the "entire agency action," which was the authorized delivery of over 2.1 million acre-feet of water, and nothing less than that.[48]

Friant defendants' attempt to excuse FWS by pointing out that FWS created a mechanism whereby it would coordinate with Reclamation "when the quantity of water to be delivered to the contractors *exceeds the average historical deliveries* . . ." (emphasis in original).[49] BORESA 040105. Friant Defs.' Br. at 36. This argument is unavailing. ESA mandates that biological opinions must be coextensive with the action authorized, 50 C.F.R. § 402.02, and does not permit incremental-step consultations. Connor, 848 F.2d at 1457-58. Because 2.1 million acre-feet of water was authorized by the long-term contracts, FWS was required to analyze the direct and indirect

[48] The court must say it can't imagine why FWS thought the Bureau was contracting for double the amount the Service thought was realistic, and why the Bureau insisted it wasn't kidding.

[49] The BiOp explains that FWS assumed "that, if deliveries are to be provided in excess of the maximum historic deliveries identified in that Appendix D, Reclamation will determine if these deliveries may affect listed or proposed species and/or critical habitat, and will include the Service in that determination." BORESA 040105.

effects of delivering 2.1 million acre-feet of water[50]

Federal and Friant defendants argue that this court cannot substitute its judgment for that of FWS, and that the decision to analyze the average of actual water delivery amounts was within FWS' discretion. I cannot agree.

While it is true that ESA does not dictate any specific method FWS must employ to evaluate effects, it does require using a method which adequately considers the impact of the action. Selkirk Conservation Alliance v. Forsgren, 336 F.3d 944, 964 (9th Cir. 2003). The question here, however, is not the method the agency employed to analyze impact, but what in fact was the scope of the proposed activity.

The scope of agency action and the proper scope of FWS' review are legal questions that do not require scientific expertise, as defendants suggest. See Connor, 848 F.2d at 1453 (adopting D.C. Circuit test of determining adequacy of biological opinion by matching the meaning of "agency action" with a legal definition of term). This court, therefore, is not required to defer to the FWS.

Moreover, even if I were required to give deference to the Agency's decision, I would still conclude that FWS violated the statute because it failed to analyze the proper scope of the

[50] Plaintiffs also object to this mechanism created by FWS because the trigger for further consultation is not reached until the Bureau delivers 1,728,582 acre-feet per year (the maximum historical deliveries to the Friant Division identified in Appendix D), well in excess of the actual amount analyzed by FWS in its BiOp. Pls.' Br. at 41.

D22. Letter from California Water Network, dated February 11, 2007

Response 1

The comment is noted. No further response is required given that the comment does not address or question the content of the Draft EIR.

Response 2

The comment generally addresses water transfers, but does not relate the comment to any specific alleged deficiency in the Landmark Village Draft EIR. The subject of water supply for the proposed project received extensive analysis in the Landmark Village Draft EIR, Section 4.10, Water Service. In addition, the Draft EIR, Appendix 4.10, contains an exhaustive appendix of water-related technical reports, studies, and other documents relative to water supply and demand and related issues in the Santa Clarita Valley and the region. The previously certified Newhall Ranch Specific Plan Program EIR also contains in-depth information regarding water supplies and demand for the Specific Plan as a whole, and for the region (see Newhall Ranch Revised Additional Analysis, Section 2.5, Water Resources, Volume VIII (May 2003)). The comment does not raise any specific issue regarding that analysis and, therefore, no more specific response can be provided or is required. However, the comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project.

Response 3

The comment is noted. No further response is required given that the comment does not address or question the content of the Draft EIR.

Response 4

The comment states that it is important to consider cumulative impacts, especially with respect to water supply. Both the previously certified Newhall Ranch environmental documentation (see Newhall Ranch Revised Additional Analysis, Section 2.5, Water Resources, Volume VIII (May 2003)), and the current Landmark Village Draft EIR, Section 4.10, Water Service, Volume II (November 2006), address significant cumulative water-related impacts to both the Specific Plan and Landmark Village. This comment, however, does not raise any specific issue regarding that analysis and, therefore, no more specific response can be provided or is required. However, the comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project.

Response 5

The comment refers to the recent California Supreme Court decision, *Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho Cordova* (2007) 40 Cal.4th 412. The *Vineyard* decision has been evaluated relative to the Landmark Village project and cumulative development in the region. Please see **Topical Response 5**: Litigation Concerning Water Supplies.

Response 6

The comment addresses cumulative water-related impacts, refers to Newhall Ranch as a "sprawl" development project, and includes other general claims not related to the adequacy or content of the Landmark Village Draft EIR.

In further response to comments concerning urban "sprawl," the County wishes to clarify that the planning of Newhall Ranch does not implicate such issues; on the contrary, Newhall Ranch has been situated and designed to promote smart growth planning principles. Newhall Ranch is immediately adjacent to existing infrastructure, major transportation corridors, a major employment center, and is within an established region identified for urban growth by the Southern California Association of Governments (SCAG). It is surrounded on its southern and eastern boundaries by urban areas, including the City of Santa Clarita, and the communities of Stevenson Ranch and Westridge, with a combined population of over 250,000 people. The Magic Mountain Theme Park is also located along Newhall Ranch's eastern boundary. SR-126 bisects its northern boundary. Directly adjacent to the north is the Castaic community and the Valencia Gateway, currently home to over 60,000 jobs. Valencia Gateway is the primary employment center for northern Los Angeles County and represents almost 80 percent of local employment.

Additionally, Newhall Ranch will dedicate to the public approximately 6,000 acres of property that is now privately owned, including portions of the Santa Clara River, representing more than half of its 12,000 acres. This dedication to a public Joint Powers Authority comes with a $2 million endowment to restore and enhance habitat. Wildlife corridors are preserved. An additional 1,500 acres of property in Ventura County that is not part of the Newhall Ranch Specific Plan, but is adjacent to its western boundary, will be preserved as well. About 90 percent of the oak trees on Newhall Ranch will be preserved, along with 64 acres of San Fernando Valley Spineflower preserves, which were deeded to the state in advance of approval.

The planning for Newhall Ranch has gone through a detailed public review and approval process for well over a decade. Many public and environmental groups have commented on that planning effort and, today, the Newhall Ranch Specific Plan is approved and in the implementation stages.

Response 7

The comment states that the Landmark Village Draft EIR, Section 4.10, Water Service, makes "overly optimistic assumptions about the long-term reliability of water that can be delivered" from the Alluvial aquifer "to show that State Water Project water is not required for this project." For information responsive to this general comment, please see the Draft EIR, Section 4.10, Water Service, pp. 4.10-17 through 4.10-44. For further information concerning the adequacy of the Santa Clarita Valley's local groundwater supplies, please see **Topical Response 9**: Groundwater Supplies and "Overdraft" Claims.

Response 8

The comment states that the local groundwater basin is not adjudicated and that the applicant's claims of "ownership" to groundwater rights is "not valid."

First, it is correct that the local groundwater basin is unadjudicated; this fact has been regularly reported in annual Santa Clarita Valley Water Reports since 1998. Second, under California law, the applicant, as an overlying landowner, has the right to take water from the ground underneath for use on the "overlying" land within the basin or watershed—the right is based on ownership of the land and is appurtenant to that ownership. The overlying owner, in this case The Newhall Land and Farming Company, is authorized to take such amounts as are reasonably needed for beneficial purposes. (See, e.g., *City of Pasadena v. City of Alhambra* (1949) 33 Cal.2d 908, 925; Cal. Const., art. X, section 2.) The rights of the overlying owner also are generally paramount. (*City of Pasadena*, *supra*, 33 Cal.2d at 927.)

As reported in the Landmark Village Draft EIR, Section 4.10, Water Service, the applicant would meet all of the Landmark Village project's potable water demands by using groundwater pumped from the Alluvial aquifer, which is presently committed to agricultural uses. The amount of water historically and presently available from this source is approximately 7,038 afy. The project's potable water demand is estimated to be 702 afy. No additional water would be pumped, instead, the water presently and historically used to irrigate crops would be pumped from sanitary-sealed municipal supply wells (as compared to open air agricultural wells), treated at the wellhead to meet Title 22 drinking water standards, and then used to meet the project's potable demand, as agricultural areas are taken out of production. The amount of groundwater that will be used to serve the potable demands of the project would not exceed the amount of water historically used for agricultural uses.

Response 9

Please see **Response 8**, above.

Response 10

The comment expresses concern regarding "shortfalls" in the local groundwater basin, it refers to the currently pending 2005 Urban Water Management Plan (UWMP) litigation, and it states that groundwater supplies are "overstated."

For information responsive to claims that groundwater supplies are "overstated" or in "overdraft," please refer to the Landmark Village Draft EIR, Section 4.10, Water Service, pp. 4.10-17 through 4.10-44, and **Topical Response 9**: Groundwater Supplies and "Overdraft" Claims.

As to the 2005 UWMP litigation, please see **Topical Response 5**: Litigation Concerning Water Supplies. In addition, as of August 3, 2007, the Los Angeles County Superior Court, the Honorable Dzintra Janavs, presiding, issued a statement of decision in favor of the Castaic Lake Water Agency (CLWA), the CLWA Santa Clarita Water Division, Newhall County Water District, and Valencia Water Company, and upheld the validity of the 2005 UWMP for the CLWA service area.

In the litigation, the author of this comment, California Water Impact Network (CWIN), and Friends of the Santa Clara River (Friends), disputed the sufficiency of the 2005 UWMP's analysis as well as various conclusions reached in the plan. For example, CWIN and Friends alleged that the plan failed to accurately estimate future water demand, overstated water supply (including groundwater supplies), and failed to address alternative water sources to bridge the alleged "gap" between water supply and demand in the Santa Clarita Valley. However, the trial court found each of the claims to be without merit and ruled that: (a) the conclusions in the 2005 UWMP are supported by substantial evidence; (b) the 2005 UWMP identifies adequate supplies to meet future demands, including both groundwater supplies and imported State Water Project (SWP) supplies (which, itself, includes CLWA's 41,000 acre-feet water transfer); and (c) the 2005 UWMP meets the requirements of the Urban Water Management Planning Act.

The recent statement of decision is found in **Appendix B** of this Final EIR. Objections to the statement of decision were filed with the trial court on or before August 20, 2007. The trial court decision may be subject to appeal by CWIN and/or Friends; however, an appeal has not yet been filed.

Response 11

The comment addresses concerns over perchlorate in the Alluvial aquifer and elsewhere. The comment also refers to CLWA's 2000 UWMP, which was amended, after litigation, in 2005, and the 2000 UWMP, as amended in 2005, was never challenged in court. Thereafter, by December 2005, the water agencies in the Santa Clarita Valley approved the new 2005 UWMP. The 2005 UWMP was the subject of a legal

challenge, which has been resolved at the trial court level in favor of the Santa Clarita Valley water agencies. Please see also **Response 10**, above.

In addition, for information responsive to concerns over perchlorate, please see the Landmark Village Draft EIR, Section 4.10, Water Service, pp. 4.10-17 through 4.10-44; and **Topical Response 1**: Perchlorate Treatment Update.

Response 12

The comment addresses CLWA's Buena Vista/Rosedale-Rio Bravo water storage project and the pending litigation concerning that project. This project was adequately addressed in the Landmark Village Draft EIR, Section 4.10, Water Service, pp. 4.10-50. In addition, please see **Topical Response 5**: Litigation Concerning Water Supplies.

Response 13

The comment claims that unspecified transfers "may be coming from so-called 'surplus water'." If this comment is claiming that Landmark Village is relying upon Article 21 water, then the comment is mistaken. Please see the Draft EIR, Section 4.10, Water Service, for a description of the water sources necessary to serve the project's demand and cumulative development in the Valley. Due to the lack of specificity in this comment, a more specific response is not possible and is not required.

However, for clarification purposes, Article 21 water refers to water that is made available by the Department of Water Resources to SWP contractors under the parties' long-term water supply contracts. Article 21 water is made available in wet weather years, is not part of SWP Table A amounts, and can be stored in surface water storage reservoirs or groundwater banks for subsequent use during dry year conditions. These dry year programs help the average reliability of SWP supplies, and are important in supporting the average year deliveries reported in DWR's SWP Delivery Reliability Report (2005), and the percentages used in the 2005 UWMP for average, dry, and multiple dry years.

Water suppliers like CLWA and Valencia Water Company do not rely specifically on the Article 21 provision of CLWA's long-term water supply contract as a primary source of water for new development. Article 21 water occurs only on a variable basis year-to-year with short delivery time frames. Nonetheless, Article 21 water remains an important provision available to SWP contractors, and the Article 21 provision makes surplus water available for various uses during wet weather conditions.

Response 14

The comment addresses CLWA's water storage programs and suggests that supplies from those programs should not be considered in "the long term demand." The County has conferred with CLWA and Valencia Water Company. First, the Landmark Village Draft EIR, Section 4.10, Water Service, p. 4.10-50, adequately describes CLWA's water storage programs. These programs also are thoroughly addressed in the 2005 UWMP, which is found in Appendix 4.10 of the Draft EIR. In addition, for further responsive information concerning pending litigation over CLWA's Buena Vista/Rosedale-Rio Bravo program, please see **Topical Response 5**: Litigation Concerning Water Supplies.

Response 15

The comment states that unspecified "contracts for the water transfers" are derivative of the Monterey Amendments, which, according to the comment, are "contingent and non-final." Under the Monterey Settlement Agreement, the parties expressly agreed that the SWP would continue to be administered and operated in accordance with both the Monterey Amendments and the terms of the Monterey Settlement Agreement. The Monterey Settlement Agreement is found in **Appendix B** of this Final EIR. In addition, for further information responsive to this request, please see **Topical Response 4**: CLWA's 41,000 AFY Water Transfer, and **Topical Response 5**: Litigation Concerning Water Supplies.

Response 16

The comment addresses the 41,000 acre-feet water transfer, and claims it should not be counted toward the Santa Clarita Valley's water supplies. Please see **Topical Response 4**: CLWA's 41,000 AFY Water Transfer, and **Topical Response 5**: Litigation Concerning Water Supplies.

Response 17

The comment is critical of the Landmark Village SB610 Water Supply Assessment. Please see **Topical Response 4**: CLWA's 41,000 AFY Water Transfer, and **Topical Response 5**: Litigation Concerning Water Supplies.

Response 18

The comment claims global warming has not been considered relative to water supplies. Please see **Topical Response 6**: Global Climate Change And Its Effects On California Water Supplies.

Response 19

Please see **Topical Response 4**: CLWA's 41,000 AFY Water Transfer, and **Topical Response 5**: Litigation Concerning Water Supplies.

Response 20

Please see **Response 8**, above.

Response 21

The comment claims that there are "excessive levels of total dissolved solids (TDS)" in the groundwater to be utilized for Newhall Ranch. The water quality data does not show that TDS levels exceed adopted standards. On the contrary, the groundwater to be used for Landmark Village has been tested, and the testing indicates that all constituents tested were at acceptable levels for drinking water under Title 22 (see Landmark Village Draft EIR, Section 4.10, Water Service, p. 4.10-42). In addition, the author of this comment raised this same issue in connection with the 2005 UWMP litigation, and the trial court rejected the issue based on substantial evidence found in both the 2005 UWMP and the record. Please see **Response 10**, above.

To the extent that the author of this comment continues to pursue this claim, the County notes that the 2005 UWMP and record are in the possession of CWIN and its counsel and that such documents are available for public inspection and review at CLWA, 27234 Bouquet Canyon Road, Santa Clarita, California 91350. The documents from the 2005 UWMP record, which support the position that TDS levels in the groundwater to be utilized for Newhall Ranch do not exceed adopted standards, are incorporated by this reference.

Finally, the comment references "Attachment 2" in support of the comment concerning TDS levels. Attachment 2 is a letter from Sierra Club to CLWA, dated October 21, 2005, in connection with comments on the 2005 UWMP. The Sierra Club comment letter, at p. 3, concerns TDS levels at an "adjacent landfill," and provides no data supporting the information presented in the comment. In contrast, results from laboratory testing conducted for the Valencia Water Company wells that will serve Landmark Village are provided in Appendix 4.10 of the Landmark Village Draft EIR. The data does not show TDS levels in excess of adopted standards.

Response 22

The comment generally refers to alternative water sources, but does not provide sufficient specificity to allow for a detailed response. However, the subject of water supply received extensive analysis in the

Landmark Village Draft EIR, Section 4.10, Water Service. This section provides data supporting the conclusion that adequate and reliable water supplies are available to serve the Landmark Village project and cumulative development in the Santa Clarita Valley -- without the need for alternative water sources. Also, please see **Topical Response 5**: Litigation Concerning Water Supplies.

Response 23

The comment addresses current legal challenges to various water supplies or water-related documents. For information responsive to this comment, please see **Topical Response 4**: CLWA's 41,000 AFY Water Transfer, and **Topical Response 5**: Litigation Concerning Water Supplies.

Response 24

The comment identifies court decisions that it claims "compromise" the Landmark Village Draft EIR and documents supporting the water supply and demand analysis found in that EIR. For further information responsive to this comment, please see **Topical Response 5**: Litigation Concerning Water Supplies.

Response 25

The comment addresses the Bay-Delta, and aquatic species in the Delta; it also states that less water in the SWP and the Central Valley Project (CVP) will be available to southern California due to Delta concerns. The County provides the following information in response to this comment:

Water availability, its reliability, and the impact of supplying that water to Newhall Ranch has been thoroughly studied in both the Los Angeles County and Court-approved Newhall Ranch environmental documents, and has been examined and debated during the lengthy open and public planning process. As shown in the approved Newhall Ranch environmental documents, Newhall Ranch will primarily use local groundwater, which has been historically used on site for agriculture operations, for urban/municipal potable uses, and recycled water from local water reclamation plants to meet Newhall Ranch's non-potable water uses (e.g., irrigation). At build-out of Newhall Ranch, a small percentage of Newhall Ranch's water supply will come from a private purchase from Kern County. This private purchase is outside of the SWP and the water supply from that purchase is guaranteed. Because these water sources meet the water needs of Newhall Ranch, including Landmark Village, no potable water will be needed from the existing or planned imported SWP supplies of CLWA.

In addition, CLWA and the local retail purveyors have extensively studied the capacity and condition of the local groundwater basin the Santa Clarita Valley. These technical studies have demonstrated that groundwater supplies are adequate to meet the water agency groundwater operating plan, without any

detrimental consequences to the basin or downstream uses. In addition, planning for the remediation of perchlorate and restoration of the impacted well capacity is substantially underway. It is also monitored closely by CLWA, the local water purveyors, the Department of Toxic Substances Control, and the U.S. Army Corps of Engineers.

Furthermore, Newhall Ranch does not rely on water pumped from the Sacramento-San Joaquin Bay-Delta, and, therefore, will not result in environmental impacts to the Bay Delta or contribute to the issues currently facing the Bay-Delta region. In addition, Newhall Ranch recognizes the current and future challenges facing the Bay-Delta, and supports the Governor's recent efforts to implement legislation and other actions that will address these issues, including Executive Order S-17-06. The Executive Order has created the Delta Vision Blue Ribbon Task Force, an appointed team that will prepare an independent public report to set forth findings and recommendations on the sustainable management of the Bay-Delta. The goal of the Task Force is to develop a sustainable management program encompassing the Bay-Delta's full array of infrastructure and land-use resources. There is wide recognition that a solution must be found for the Bay-Delta, and both the County and the applicant support the Governor's latest actions and funding proposals to address these issues.

For further information responsive to this comment, please see **Topical Response 5**: Litigation Concerning Water Supplies.

Response 26

The comment mentions global warming "exacerbating" the Bay-Delta "problem." For information responsive to this comment, please see **Response 25**, above; and **Topical Response 6**: Global Climate Change And Its Effects On California Water Supplies.

Response 27

The comment discusses imported supplies from the SWP and the CVP. As stated in the Landmark Village Draft EIR, Section 4.10, Water Service, p. 4.10-2 to 4.10-4, the proposed project does not rely on either SWP or CVP supplies. Instead, Landmark Village will use local groundwater and recycled water from local water reclamation plants to meet potable and non-potable water demand. Nonetheless, for further information responsive to this comment, please see **Topical Response 5**: Litigation Concerning Water Supplies.

Response 28

The comment addresses issues concerning water reliability. For information responsive to this comment, please see **Topical Response 4**: CLWA's 41,000 AFY Water Transfer, and **Topical Response 5**: Litigation Concerning Water Supplies.

Response 29

Please see **Topical Response 4**: CLWA's 41,000 AFY Water Transfer, and **Topical Response 5**: Litigation Concerning Water Supplies.

Response 30

Please see **Topical Response 4**: CLWA's 41,000 AFY Water Transfer, and **Topical Response 5**: Litigation Concerning Water Supplies.

Response 31

Please see **Topical Response 6**: Global Climate Change And Its Effects On California Water Supplies.

Response 32

Please see **Response 30**, above.

Response 33

Please see **Topical Response 5**: Litigation Concerning Water Supplies.

Response 34

Please see **Response 33**, above.

Response 35

Please see **Topical Response 4**: CLWA's 41,000 AFY Water Transfer, and **Topical Response 5**: Litigation Concerning Water Supplies.

Response 36

Please see **Topical Response 5**: Litigation Concerning Water Supplies.

Response 37

Please see **Topical Response 4**: CLWA's 41,000 AFY Water Transfer, and **Topical Response 5**: Litigation Concerning Water Supplies.

Response 38

Please see **Response 37**, above.

Response 39

The comment is well beyond the scope of the Landmark Village project and Draft EIR. In addition, Landmark Village does not rely on SWP supplies to meet its potable or non-potable water demand. Nonetheless, for general information responsive to this comment, please see **Topical Response 4**: CLWA's 41,000 AFY Water Transfer, and **Topical Response 5**: Litigation Concerning Water Supplies.

Response 40

The comment does not address the adequacy or content of the Landmark Village Draft EIR. Please see also **Response 39**, above. Additional information responsive to this comment is found in the 2005 UWMP, which is found in Appendix 4.10 of the Draft EIR.

Response 41

The comment is noted. No further response is required given that the comment does not address or question the content of the Draft EIR.

Response 42

The comment requests that the County rely only on 54,200 acre-feet of SWP water for the reasons set forth in the comment. The County relies on CLWA and the local retail water purveyors for their expertise in providing water management, supply, and demand information to the County. In this respect, CLWA has consistently reported to the County that its SWP Table A supplies are 95,200 acre-feet per year and that these supplies are variable and subject to reduction due to regulatory, environmental, and hydrological conditions. However, CLWA has never advised the County that its SWP supplies are only 54,000 acre-feet. The Landmark Village Draft EIR, Section 4.10, Water Service, also accurately summarizes for information purposes CLWA's SWP supplies and the litigation challenges to such supplies (see Draft EIR, pp. 4.10-12–4.10-14; and 4.10-44–4.10-57). As to litigation uncertainties, and the reasons why alternative water supply sources are not necessary at this time, please see, generally, **Topical**

Response 4: CLWA's 41,000 AFY Water Transfer, and **Topical Response 5**: Litigation Concerning Water Supplies.

Response 43

The comment is noted. No further response is required given that the comment does not address or question the content of the Draft EIR.

Letter No. D23

Friends of the Santa Clara River

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Wishtoyo Foundation

February 16, 2007

Mr. Daniel Fierros
Los Angeles County Department of Regional Planning
Impact Analysis Section, Room 1348
320 West Temple St.
Los Angeles, CA 90012

ENV-27

Re: Comments on Draft Environmental Impact Report - Newhall Ranch, Landmark Village (County Project No. 00-196)

Dear Mr. Fierros,

Friends of the Santa Clara River submits the following additional comments on the subject project.

The Chloride TMDL for the Santa Clara River governs allowable chloride discharges from the Saugus and Valencia treatment plants. These discharges are now far in excess of TMDL limits and chlorides are now beginning to show up strongly in groundwater of the Piru basin. Chloride data developed by United Water Conservation District have been sent by separate cover. 1

Landmark Village treatment plant discharges will be additive to those discussed above. These impacts need to discussed in the EIR and appropriate mitigation defined. 2

Thank you for your consideration of these comments. 3

Sincerely,

Ron Bottorff

Ron Bottorff, Chair

Attachment

1. Bachman, Steven, and Detmer, Daniel, *Chloride in the Piru Basin*, United Water Conservation District, April 2006.

CHLORIDE in the PIRU BASIN

Photo: Piru groundwater basin, looking downstream from Newhall Bridge

Steven Bachman, PhD, Groundwater Resources Manager
Daniel Detmer, C.Hg, Senior Hydrogeologist
United Water Conservation District
April, 2006

Introduction

Chloride concentrations in groundwater have been increasing since 1999 in the eastern portion of the Piru groundwater basin. This investigation examines both groundwater data and surface water data to determine water quality trends and potential causes for those trends. This investigation provides a technical basis for policy on wastewater discharges in upstream Los Angeles County, the most significant documented source of chloride loading to the Piru basin. The cause of increasing chloride concentration in groundwater has been attributed by some to increases in chloride loading to the Santa Clara River, while others assert recent impacts fall within the normal fluctuations due to wet and dry climatic cycles. Of particular interest is the linkage between surface water quality and groundwater quality in various parts of the basin, and the historic variations in chloride concentrations throughout the basin.

Overview of Chloride Occurrence in the Piru Basin

Chloride in the majority of the Piru basin has historically ranged from approximately 30 to 65 mg/l (e.g., Map 4 and Map 5). However, the eastern portion of the basin, east of the confluence of Piru Creek, has historically recorded groundwater chloride concentrations exceeding 150 mg/l between the years 1957 and 1966 (Map 4 and Figure 1). The high chloride in the eastern portion of the basin in the 1950s and 1960s is attributed to the discharge of oilfield brines into tributaries to the Santa Clara River prior to the enactment of the federal Clean Water Act. West of Piru Creek, chloride concentrations remained well below 100 mg/l during that same time period, and reflect historic chloride concentrations in the basin. Following the prohibition of the improper disposal of oilfield brines in Ventura and Los Angeles counties, chloride concentrations remained below 100 mg/l for many years (Map 5 and Map 6).

The historical range of groundwater chloride concentrations in the Piru basin prompted the Los Angeles Regional Water Quality Control Board to set a water quality objective of 100 mg/l west of Piru Creek and 200 mg/l east of Piru Creek. This standard for the eastern portion of the basin remains at 200 mg/l even as water quality improved in the basin once oilfield brines were no longer discharged into the river, and is inconsistent with the surface water objective of 100 mg/l for the Santa Clara River in this vicinity. Recent and historic studies indicate the 100 mg/l chloride is the appropriate water quality objective for all waters of the Piru basin, being protective of chloride-sensitive agricultural uses common to the basin, and all other recognized beneficial uses (CH2M Hill, 2005, and LA RWQCB, 1994).

Since 1999, chloride in the eastern portion of the Piru basin has steadily increased from the post-Clean Water Act ambient level of approximately 80-100 mg/l to levels as high as 176 mg/l (Figure 1). This new occurrence of high chloride concentrations is clearly observable in the area east of Piru Creek (Maps 9-11). During and following the drought of the late 1980s, and for the past several years, chloride concentrations in wells located just west of Piru Creek have also exceeded 100 mg/l (Map 7). The occurrence, sources areas and fate of chloride in the Piru basin is examined in this report.

Hydrogeology of the Piru Basin, Groundwater Flow System

The Piru groundwater basin is an elongate alluvial basin located along the Santa Clara River Valley in eastern Ventura County. The basin is approximately ten miles long and less than two miles across at it widest point, covering an area of approximately 7,000 acres. Some investigators include the alluvium of lower Piru Canyon as part of the basin, resulting in a larger area of approximately 8,900 acres (CA DWR, 2003). The eastern boundary of the Piru basin is defined by the near-surface presence

of the non water-bearing rocks of the Pico Formation, where alluvial deposits are thin and subsurface flow is believed to be minor. The upstream basin boundary is commonly drawn near the former USGS gauging station at Blue Cut where the river channel is narrow and the river makes a distinct bend around exposed rocks of the Pico Formation. The downstream boundary of the Piru basin is located in the vicinity of the Fillmore Fish Hatchery, approximately two miles upstream of the A Street Bridge in the City of Fillmore. The downstream boundary is drawn at the bottom of the topographic narrows that extend more than two miles upstream from this location. These narrows restrict groundwater discharge from the basin, often resulting in rising groundwater that discharges to surface flow in the Santa Clara River (Map 1).

The basin fill (aquifers) of the Piru groundwater basin consists of recent and older alluvium, underlain by deposits of the San Pedro (Saugus) Formation (Mann, 1959). The recent and older alluvium is made up of highly-permeable coarse sand and gravel that exist basin-wide to a depth of approximately 60 - 80 feet. The San Pedro Formation consists of permeable sand and gravel and extends to a depth several thousand feet below land surface. The basin is generally bounded on the north by the San Cayetano fault and on the south by the Oak Ridge fault. Both faults are significant regional faults accommodating the north-south compressive regime of the Transverse Ranges, and the narrow plan shape and thick sediments of the Piru basin result from this compression. The Piru basin is considered an unconfined groundwater basin. Low-permeability units have been observed in specific locations, most commonly in the older alluvium, but nowhere are they so extensive or continuous that confined groundwater conditions are suggested (Mann, 1959).

Recharge to the Piru Basin

Major surface water inputs to the Piru basin include the Santa Clara River, Piru Creek, and Hopper Creek, all of which are gauged continuously for flow rates. Additional lesser inputs include inflow from minor side canyons, the direct percolation of rainfall, and direct recharge to outcrop on the basin margins beyond the extent of the basin fill. The near-surface sediments in the Piru basin have a tremendous percolation capacity, allowing the rapid infiltration of large volumes of surface water through the bottom of the river channel. The capacity of the basin to accept surface water as groundwater recharge is somewhat dependent on channel morphology and depth of the underlying groundwater, but recharge is rarely limited in the upstream portions of the basin where a broad, flat, braided sandy channel is normally located. Between the present location of the USGS gauging station at the Newhall bridge and the area upstream of the confluence of Piru Creek and the Santa Clara River, both the floodplain and the basin itself widens and surface water readily percolates into the ground, recharging the upstream end of the basin's groundwater flow system. The high percolation rates in this upstream end of the Piru basin cause the entire flow of the Santa Clara River to infiltrate during much of the year, creating a "dry gap" which typically extends some five miles downstream to the vicinity of Cavin Road east of the Fillmore Fish Hatchery (Map 1). The constriction of the Piru basin in this area coincides with a stable groundwater gradient that often intersects the bottom of the river channel, resulting in a gaining reach of the river where groundwater discharges to the river channel, re-establishing surface flow in the river system.

United Water has conducted various investigations of the percolation of surface water in the Piru basin over the past 75 years. While a principle study objective has been the optimization of the conveyance of water released from Lake Piru across the permeable midsection of the Piru basin, recharge estimates have also been calibrated for the reach of the Santa Clara River between the USGS flow gauge at Blue Cut and the confluence of Piru Creek. Recent studies by United Water confirm that this reach readily percolates large volumes of water: typical dry weather flows of approximately 25-30 cubic feet per second (cfs) percolate entirely in this reach, approximately 85 percent of flows as high as

100 cfs percolate here, and percolation as high as 1000 cfs has been estimated during flood flows. The width of the river channel exceeds 1000 feet throughout most of the basin, and high percolation rates are also commonly observed in the reach extending from Torrey Road to the area of rising water near the western downstream end of the basin. The Santa Clara River is the largest source of recharge to the Piru basin, and during typical base flow conditions (non-stormflow conditions), all of the river flow percolates to groundwater in the eastern third of the basin.

Piru Creek is the largest tributary to the basin, entering the basin from the north. The sediments of the Piru Creek fan are also highly-permeable, and significant recharge occurs at times along this channel. Additional recharge is possible in this vicinity via United Water's Piru spreading grounds, a 44-acre facility near the west bank of Piru Creek, which is supplied water by a diversion structure near the town of Piru. Artificial recharge totals at the Piru grounds are low in recent years, as the facility is used less than it was historically because of the importance of bypassing the maximum amount of water to the facilities in the Oxnard Plain to combat seawater intrusion. United Water commonly releases three to five cfs from Lake Piru during most of the year, which flows down Piru Creek before percolating to groundwater along Piru Creek where it meets the main groundwater basin.

Groundwater Flow in the Piru Basin

Groundwater flow paths in Piru basin appear to vary little from year to year, with the dominant flow moving westerly down the axis of the basin. Recharge sourcing from Piru Creek and Hopper Creek result in groundwater flow with a more southerly component in the north-central portion of the basin. This effect is most apparent during wet years when recharge from the tributaries is greater. In the eastern and western portions of the basin, where there is no significant recharge from sources along the edges of the basin, groundwater flow is consistently interpreted to be straight down the basin, parallel with the Santa Clara River channel. United Water's interpretation of available groundwater elevation data reveal that flow paths vary little between years, largely due to high permeability of the aquifers, the relatively even distribution of pumping for irrigated agriculture throughout the basin, and the lateral constraints on the flow system.

While the direction of groundwater flow varies little through time, groundwater gradients tend to vary with climatic conditions. United Water has contoured fifty years of spring and fall water level records, allowing the following observations. In the wettest years, the high percolation capacity of the basin allows it to rapidly fill to capacity, and the slope of the water table becomes fairly consistent across the entire basin (Map 2). This consistency in slope is also fairly persistent under all climatic conditions in the two-mile reach between Cavin Road and the downstream end of the basin, where the sides of the basin are nearly parallel and the aquifers of the basin discharge rising groundwater to the river. This groundwater discharge to the river maintains a fairly steady flux of groundwater exiting the basin.

Steep groundwater gradients are common in the eastern portion of the basin where the basin is narrow, basin fill is believed to be thinner, and the upstream portions of the alluvial and San Pedro aquifers remain saturated by the constant recharge of Santa Clara River water sourcing from Los Angeles County. As the basin becomes wider in the area just east of Piru Creek, flowpaths diverge, and the groundwater gradient becomes less steep. Where Piru Creek enters the basin from the north, the basin is at its widest, depths to groundwater are greater, and groundwater flow fields are more variable and dynamic due to the intermittent inputs from Piru Creek. The central third of the basin between Piru Creek and Hopper Creek is where much of the variable storage in the basin occurs. Water levels in this area are observed to decline during dry periods, and groundwater gradients become less steep (Map 3).

Chloride in the Santa Clara River

An extensive water quality record exists for the Santa Clara River near the Los Angeles-Ventura County line, allowing an evaluation of long-term trends. Sample collection points have historically included Blue Cut, the surface water diversion point for Rancho Camulos, and more recently the new gauging location at the Newhall bridge (and possibly the county line proper). These sampling locations are all located near the Blue Cut constriction where alluvium is thin, and it is reasonable to combine these records. Much of the older data were collected by the California Department of Water Resources, and much of the recent data by United Water Conservation District. Figure 1 displays recorded chloride concentrations from the past 55 years, and three distinct periods are apparent. Between 1951 and 1968, high and variable chloride concentrations were recorded in the river, with the source of the high chloride attributed to the surface discharge of oilfield brines. The Del Valle, Newhall-Potrero and Castaic Junction oil fields exist near the Santa Clara River between Interstate 5 and the county line. The Los Angeles Regional Water Pollution Control Board recognized this serious threat to water resources of the region, commissioned a study of local practices, and then took prompt action to stop surface water and groundwater pollution associated with this improper discharge of brines (e.g., CA DWR, 1959). Flow at Blue Cut during this period was considerably less than flow recorded in recent decades.

Between 1969 and 1975 chloride concentrations exceeding 100 mg/l were not recorded in the Santa Clara River at Blue Cut. Between 1975 and 1999 measured chloride concentration generally ranged from 70 to120 mg/l, with the average chloride concentration of this period of record being 93 mg/l. Data is unavailable for the dry years 1989 through 1991, except for one sample in 1990. The time period from the mid-1970s to the late-1990s was also a period of increasing flow in the Santa Clara River, corresponding to population growth in the Santa Clarita area and increased imports of water from the State Water Project.

The third distinct period apparent in Figure 1 is the period from 1999 to present, characterized by steadily increasing chloride concentrations in the Santa Clara River at Blue Cut. Beginning in the summer of 1999 chloride concentrations routinely exceed 120 mg/l, and chloride values of 150 mg/l were recorded in the winter, spring and fall of 2004. The year 2005 was the second-wettest on record for a number of gauges in the Santa Clara River Valley, and the increased runoff and groundwater discharge from the upper watershed has served to temporarily dilute chloride concentrations at Blue Cut. Additional flow was provided by sustained released from Castaic Lake, which continued into July 2005. However, the dilution benefits of this exceptionally wet year were short-lived, and chloride concentrations of 125 and 134 mg/l were recorded in August and November 2005, respectively.

Chloride in Piru Creek

Santa Felicia Dam was constructed by United Water Conservation District in 1955 in order to capture winter runoff from the Piru Creek watershed. Stored water is typically held through the summer and released in the fall for downstream beneficial uses. As the released water flows down Piru Creek and then the Santa Clara River, some of the water percolates to groundwater, providing recharge to the Piru, Fillmore and Santa Paula basins. However, releases are carefully managed to optimize the conveyance of water past these basins to the Freeman Diversion, where the water is diverted for groundwater recharge to the Oxnard Forebay basin and direct irrigation delivery on the Oxnard Plain. These activities directly support one of United Water's primary groundwater management objectives, the abatement and reversal of saline intrusion in coastal areas of the Oxnard Plain and Pleasant Valley

groundwater basins. Continuous releases of three to five cfs are maintained throughout the year to sustain fish and riparian habitat in Piru Creek below Santa Felicia Dam.

Pyramid Lake was completed in the upper Piru Creek watershed in 1973 by the California Department of Water Resources, as part of State Water Project (SWP). The reservoir receives larges volumes of SWP water sourcing from the Sacramento River in northern California, and provides regulated storage for hydroelectric power generation at Castaic Lake. United Water holds the rights to surface water yielded by the Piru Creek watershed, and DWR routinely releases water volumes down Piru Creek equaling that of measured inflow to Pyramid Lake. As a result, the water released downstream to Lake Piru often reflects the chemical character of SWP water. SWP water is prone to elevated chloride concentrations in certain years, most notably when northern California is experiencing dry climatic conditions. United Water also has an allocation to purchase as much as 3750 acre-feet of State Water to release down Piru Creek for storage in Lake Piru.

Historic water quality records from Piru Creek below Santa Felicia Dam are displayed in Figure 2. Water quality trends generally follow climatic cycles, with chloride increasing during drier conditions. The water quality record shows a pronounced peak in chloride concentration during and following the drought of the late 1980s-early 1990s, when local inflow to the lake was low and chloride concentrations in the SWP were high. A trend of increasing chloride was also observed in the years following the record wet year of 1998, reaching a maximum-recorded concentration of 77 mg/l in 2004. Chloride concentrations in Lake Piru dropped to 30 mg/l following the significant rains of 2005.

Chloride Concentrations in Groundwater

As detailed in the hydrogeology section above, the Piru basin readily accepts great volumes of recharge water from the channel of the Santa Clara River. One major source of recharge to the basin is the continuous percolation of surface water discharge from Los Angeles County, with daily average flows commonly ranging from 20 to 30 cfs since the early 1980s. A second major source of recharge is the downward percolation runoff during significant winter storms, which inundate broad areas of the Santa Clara River floodplain with floodwaters of low chloride concentration. These large storms tend to occur infrequently, and the timing of their occurrence is not predictable.

Figure 1 plots chloride concentrations from five Rancho Camulos wells along with chloride records collected at Blue Cut, located a short distance upstream (Map 1). All of these wells are located in the eastern third of the Piru basin where the only significant source of recharge is water flowing past Blue Cut. Chloride data from these wells are also shown on Maps 4 through 11. The strong correlation of chloride concentrations in these wells in the eastern third of the basin to chloride records from Blue Cut provides compelling evidence of the influence surface water quality has on groundwater in this portion of the basin, and confirms our understanding of the recharge and flow system of the basin.

Figure 3 plots all available surface water and groundwater chloride data for the discharge portion of the Piru basin west of Cavin Road. Prior to the mid-1970s, groundwater chloride concentrations were variable in this vicinity, but many records show chloride concentrations ranging from 20 to 45 mg/l. In later years chloride concentrations less than 40 mg/l become less common, and many records fall within a range of 45 to 70 mg/l. Surface water quality data are unavailable prior to 1992. Chloride in surface water samples collected near the Fillmore Fish Hatchery typically fall within the range of groundwater records in this area, reflecting the common condition of groundwater discharge to surface water near the downstream boundary of the Piru basin.

Annual maps showing the maximum-recorded chloride concentration were generated for the years 1955 through 2005, allowing a spatial display of historical chloride records for the Piru basin. The number of data points varies from year to year, but these water quality maps are valuable tools for

assessing changes in water quality in the basin. The following maps were selected to portray recent and historical water quality conditions in the basin, with consideration given to the quality of the annual data set and the hydrologic conditions of the year being displayed. In many cases, only a single chloride record exists for a given well in a single year, but when more than one record exists, the maximum-recorded value is plotted. Maximum and average chloride concentrations are also labeled at surface water monitoring locations. The following notes and comments are meant to accompany the annual maps selected for inclusion in this report.

Map 4, 1962 - A wet year following two dry years, but basin storage is still fairly low as this year falls within the long-term dryer period ranging from 1945 to 1977. Chloride impacts associated with oilfield brines are seen in surface water concentrations at Blue Cut and in groundwater east of Piru Creek. Good chloride records from this year show annual maximum chloride concentrations averaging 48 mg/l between Piru Creek and Cavin Road. West of Cavin Road, in the area where older waters are exiting the basin, chloride concentrations average 34 mg/l.

Map 5, 1972 - A dry year following several average and wet years, basin storage is similar to recent years (1999-2004). Chloride concentrations throughout the basin range from 26 to 90 mg/l. Limited records show the eastern portion of the basin has recovered from brine impacts. Data is lacking in the area immediately west of Piru Creek. Chloride records from all wells in the basin are recorded below 100 mg/l chloride for the next fifteen years (except for several records from a single well drilled adjacent the northern basin boundary).

Map 6, 1987 - A dry year following wet years in 1983 and 1986 and dry years in 1984 and 1985. A good annual data set shows groundwater chloride ranging from 35-98 mg/l.

Map 7, 1990 - Peak of the last drought. Groundwater chloride concentrations of 110 mg/l recorded near Piru Creek and United Water's Piru spreading grounds. Chloride concentrations as high as 100-110 mg/l are seen for the next three years in the area of the Piru Creek fan, sourcing from reservoir releases from Lake Piru. High-chloride water is imported to the Piru Creek watershed as an unintended consequence of the transfer of SWP water to southern California, but the actual purchase and import of SWP water to the lower Santa Clara River is minor. Chloride records are not available for Blue Cut or groundwater in the eastern Piru basin in this year (the one chloride record at Blue Cut appears to be erroneous).

Map 8, 1993 - Second consecutive wet year. The Piru basin is considered to be essentially full, with a fairly uniform groundwater gradient across the basin. These conditions saturate the uppermost aquifer in the basin, the highly-permeable deposits of younger alluvium. Following occurrences such as this, groundwater concentrations are often more variable throughout the basin, making it is more difficult to recognize chloride movement away from specific source areas. The downward flushing of salts accumulated in soils also occurs in the wettest years, and the relative importance of these two salt transfer mechanisms is not well understood. By this time chloride concentrations at Blue Cut and in groundwater in the eastern Piru basin regularly exceed 100 mg/l, conditions which continue to present times.

Map 9, 2001 - Wet year following a dry and average year, also a wet year at the end of the wettest decade on record (Santa Paula gauge #245). Lake Piru has low chloride concentrations and the

upper Piru Creek fan has apparently been flushed of high chloride by the multiple wet years following the last drought. Chloride at Blue Cut has increased steadily since 1999 (Figure 1), and impacts to groundwater in the eastern Piru basin match the surface water records. Chloride of 100 mg/l or more is recorded in wells west of Piru Creek for the second time in as many years, and this increase cannot be accounted for by sourcing from Piru Creek.

Map 10, 2004 - Dry year following average. Basin depletion greatest since the drought, steep groundwater gradients observed in the eastern portion of the basin. Surface water and groundwater chloride in eastern Piru basin recorded in excess of 150 mg/l. Record-high chloride of 138 mg/l recorded in Camulos well west of Piru Creek, with the only apparent source being water moving from the eastern Piru basin. Chloride concentrations in Piru Creek remain relatively low.

Map 11, 2005 - Very wet year, Piru basin fills to capacity again. High chloride is still very pronounced in groundwater in the eastern basin, and one well west of Piru Creek. The only apparent source of high chloride in the well west of Piru Creek is from the eastern Piru basin. As in 1993 when a good data set exists for similar hydrologic conditions, groundwater chloride concentrations are variable throughout the basin.

The chloride concentration maps presented here do not answer all questions related to the movement of chloride in the Piru groundwater basin, but they are very useful observational tools in a basin such as this where the sources of recharge and the groundwater flow system are well understood. Sufficient data are available to show the occurrence of chloride over time, and the periodic expansion of chloride pollution from well-defined inputs such as the Santa Clara River and Piru Creek. However, specific "packages" or "plumes" of historic high chloride inputs are often not traceable over long distances or many years. Most existing data are from production wells with large screened intervals, and various processes exist that promote the mixing or waters within the basin. Although the exact fate and migration pathways of chloride in the Piru basin are not completely understood, the chloride data presented here show the effect of long-term chloride loading in the basin, evidenced by the increasing chloride concentrations in groundwater and in surface flows at the discharge point of the basin (Figure 3). In the early 1960s chloride concentrations ranging from 20 to 40 mg/l were common in this locality. In recent years chloride concentrations ranging from 45 to 70 are the norm. This is the only significant avenue for chloride to exit the basin, and the tremendous ongoing mass of chloride being loaded at the upstream portions of the basin will continue to move downgradient, increasing chloride concentrations at this point, and points beyond.

Summary and Conclusions

The increase in chloride concentrations in the eastern Piru basin since 1999 directly correlates in time and concentration with the increase in chloride in the Santa Clara River at the county line. There is little doubt that the chloride in the river is causing the increase in chloride in the eastern basin – not only is there a direct correlation between the two, but the river is the sole significant recharge source to the eastern basin. In fact, the entire flow of the river infiltrates into the basin during most of the year, leaving a dry riverbed for a distance across the eastern portion of the Piru basin.

The connection between high chloride in the river and in the eastern Piru basin was previously demonstrated in the 1950s and 1960s when brine that was high in chloride was discharged into the Santa Clara River from oilfields along the river drainage. The Los Angeles Regional Water Pollution

Control Board took action to stop this discharge of high chloride into the river, which subsequently improved the water quality of both the river and the eastern Piru basin.

However, this oilfield discharge was actually less of a threat to the Piru basin than the current chloride pollution because flows in the river were much smaller in those days. Today, the importation, use, and discharge of State Water into the Santa Clara River has increased flows at the county line, and high chloride concentrations are consistently documented in wastewater discharges. This higher loading (a larger volume of high chloride water) allows chloride pollution to migrate farther downgradient within the Piru basin. In fact, higher chloride concentrations have occurred in wells just west of Piru Creek over the past several years, at the same time that recharge water percolating from Piru Creek had much lower chloride concentrations. An imminent threat to the basin is that these higher chlorides just west of Piru Creek are the beginning of degradation of the remainder of the Piru basin, caused by the high salt loading in the eastern Piru basin.

The salt loading in the Piru basin caused by higher salts in the Santa Clara River cannot be easily dismissed as an artifact of climatic conditions along the river. The period since 1999 has been wetter than normal, including the second wettest year on record (2005). Only in 2005 did chloride concentrations dip, and this was a temporary condition caused by the very high flows in the river that diluted salts being discharged into the river in Los Angeles County.

Water quality degradation of the Piru basin is clear during the past several years. The eastern basin continues to degrade as Santa Clara River water increases in chloride concentration. Degradation of the western portion of the basin may have commenced just west of Piru Creek, and the degraded water in the eastern Piru basin has no place to flow except into the western basin, creating the conditions for further degradation of the reminder of the Piru basin. It is clearly time for regulatory action to prevent further degradation of the Piru basin.

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Mann, John, 1959. A Plan for Groundwater Management. Technical hydrogeologic investigation of the groundwater basins and water resources within the United Water Conservation District.

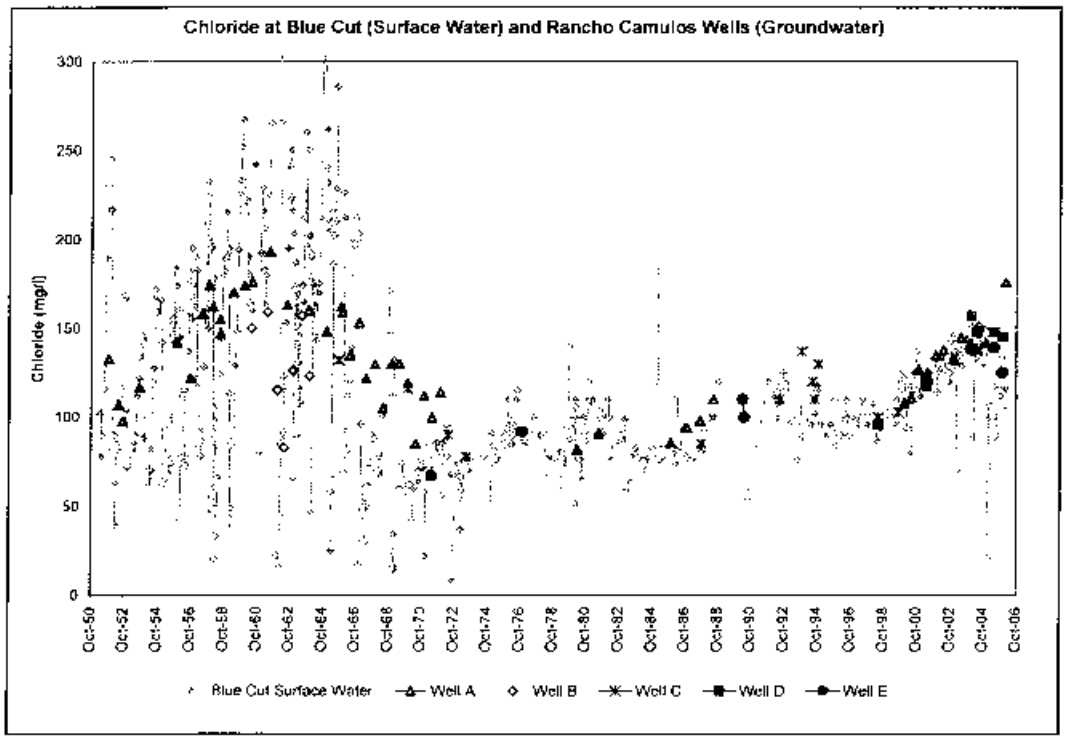


Figure 1.

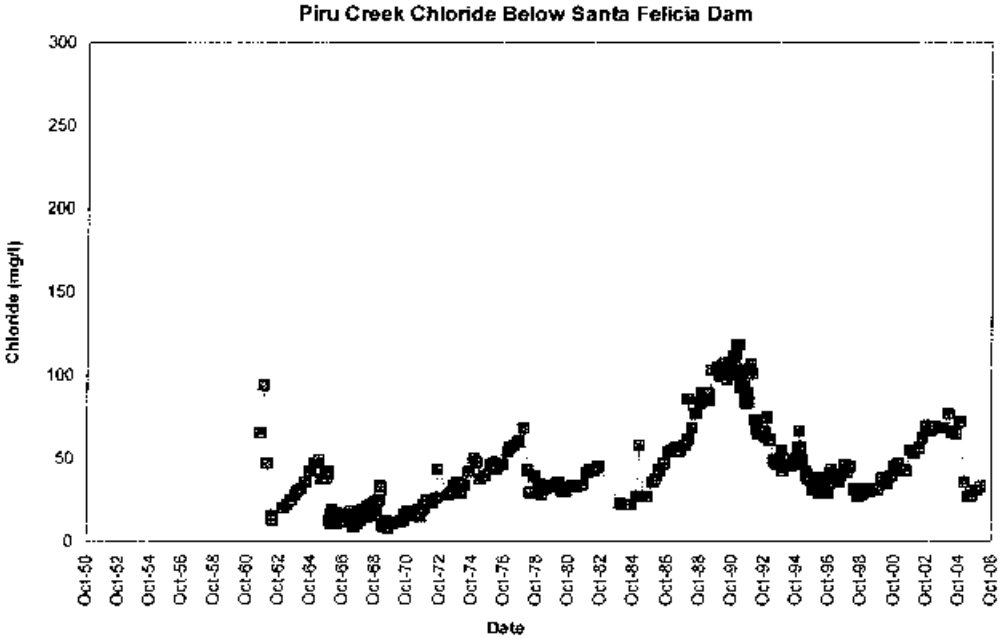


Figure 2.

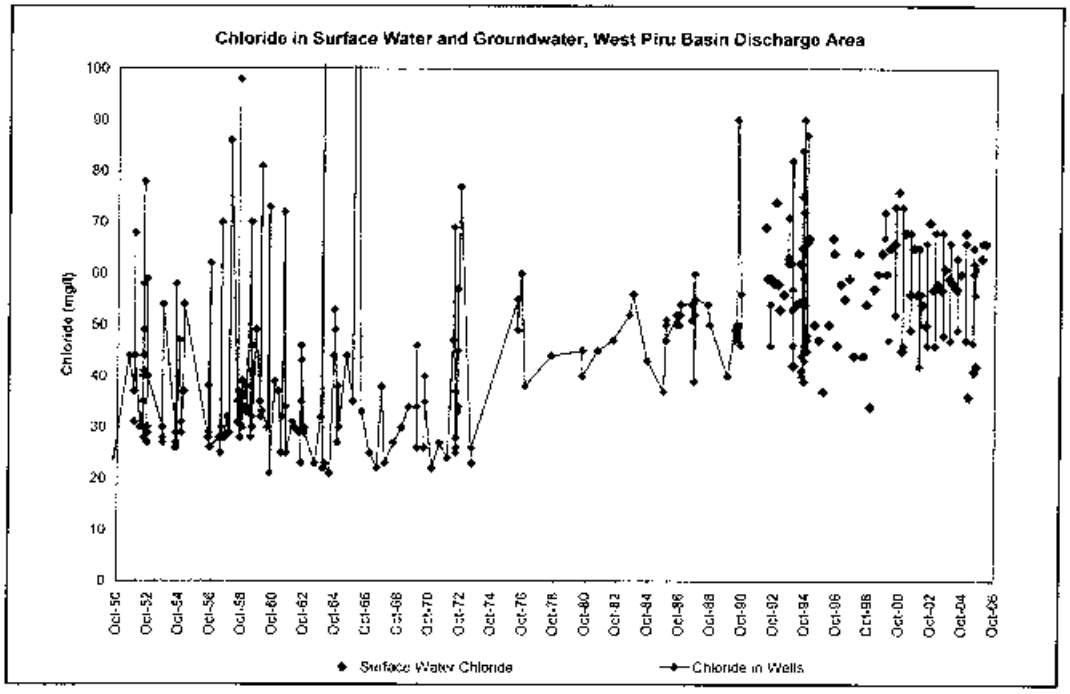
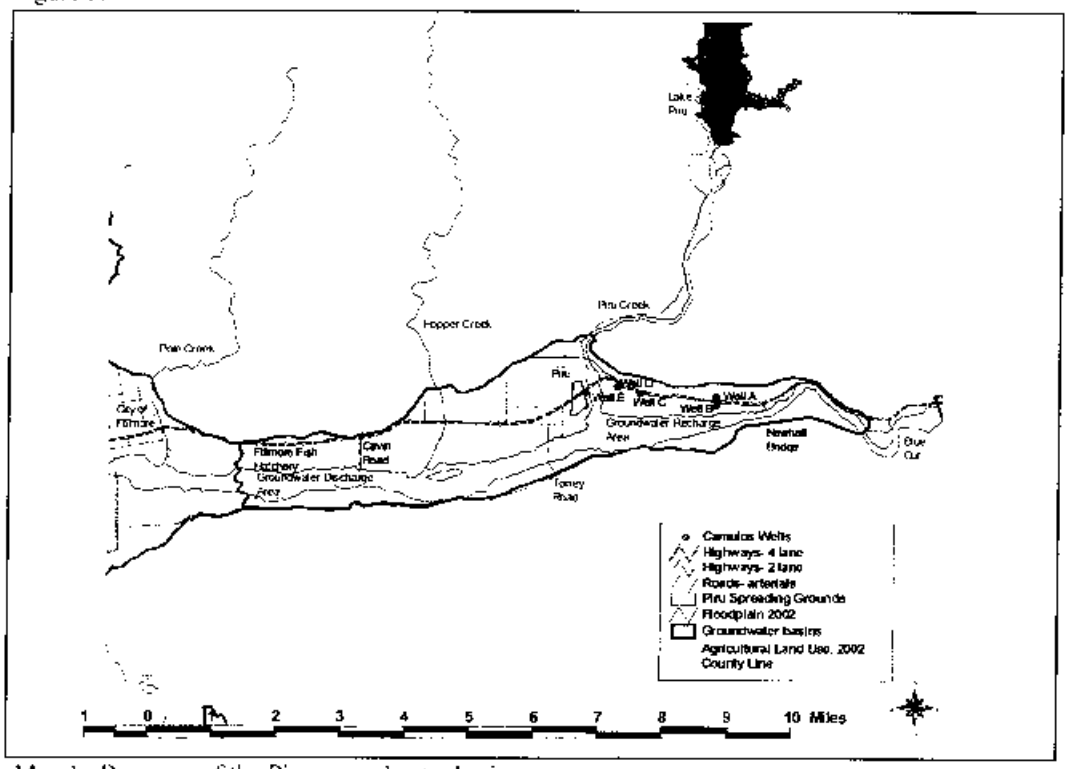
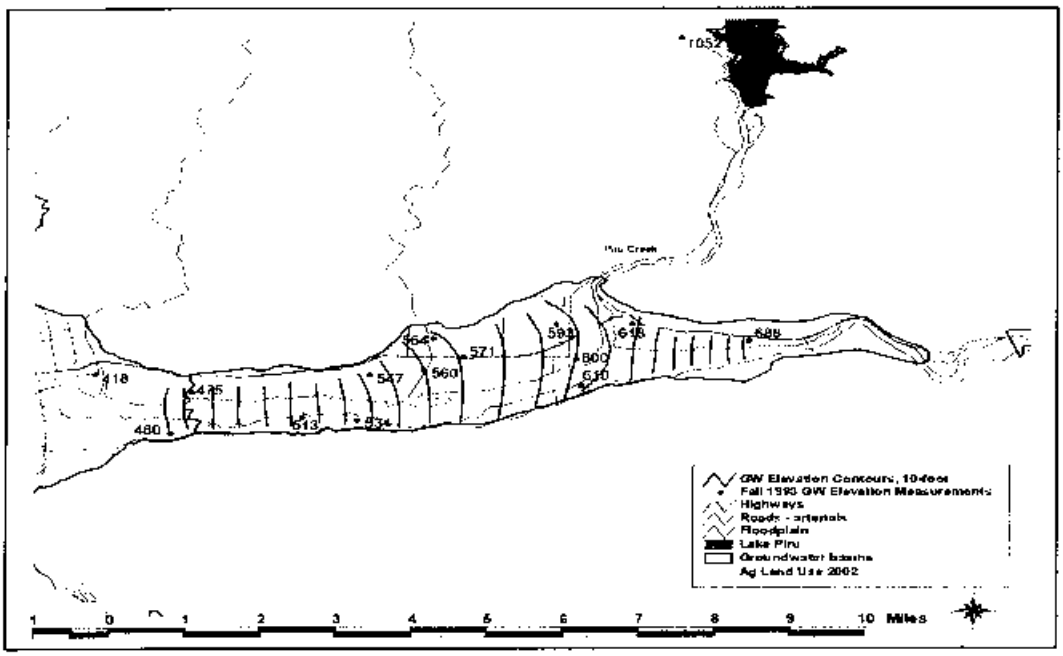


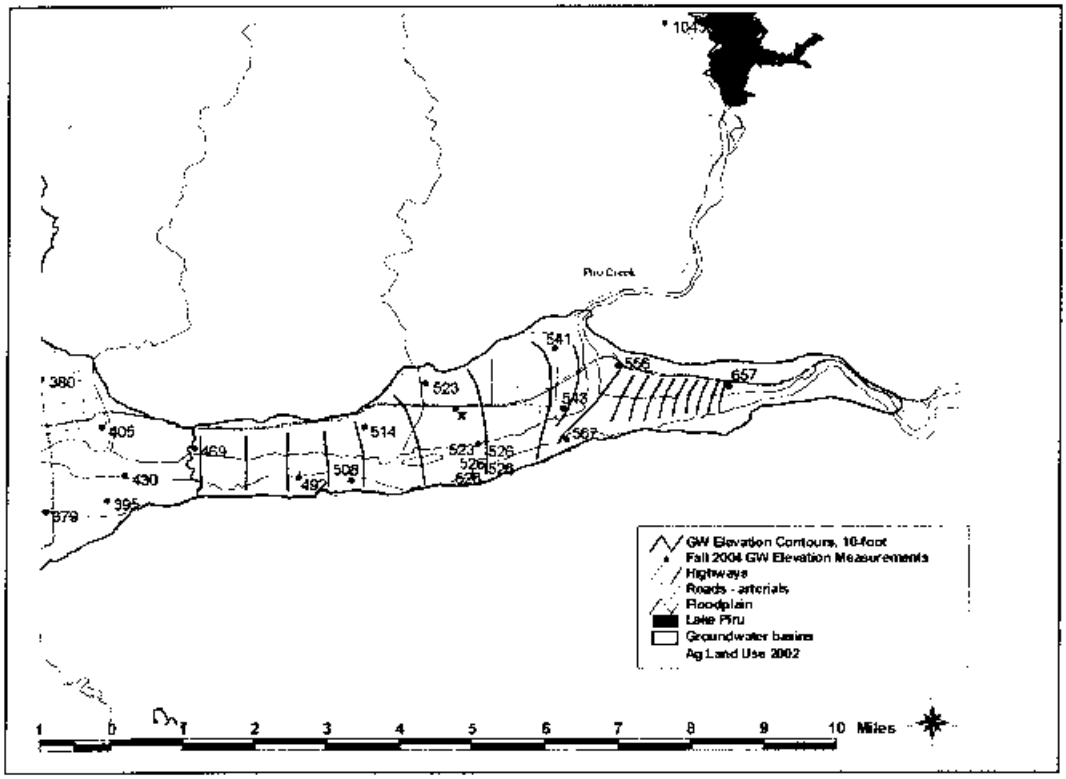
Figure 3.



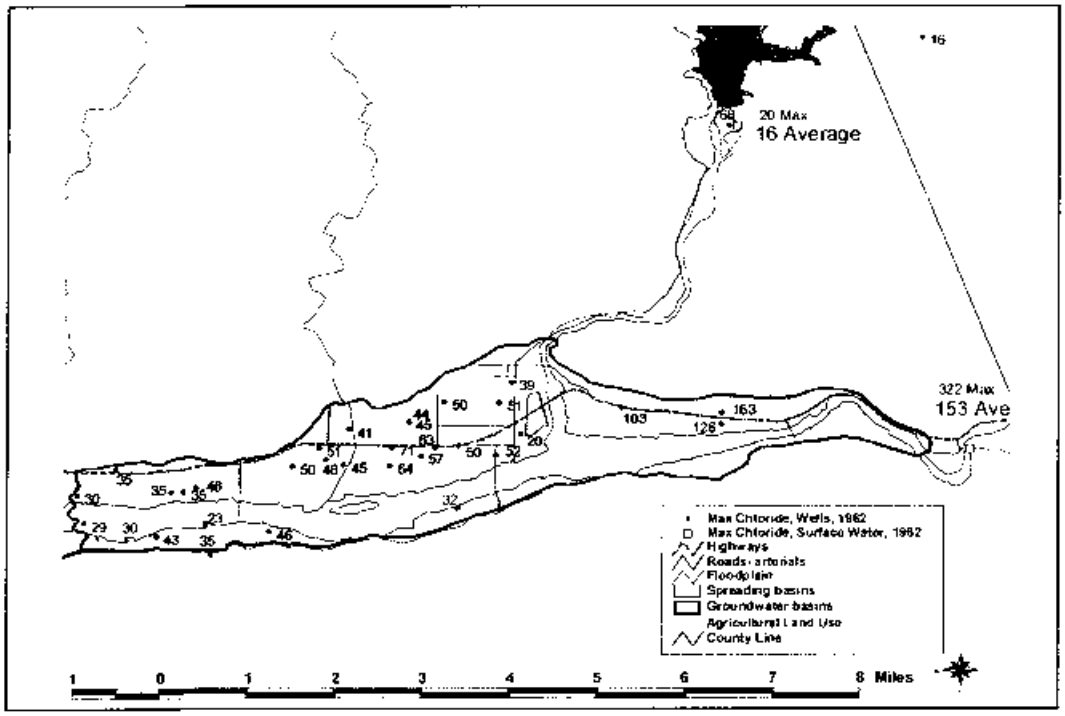
Map 1. Base mapof the Piru groundwater basin



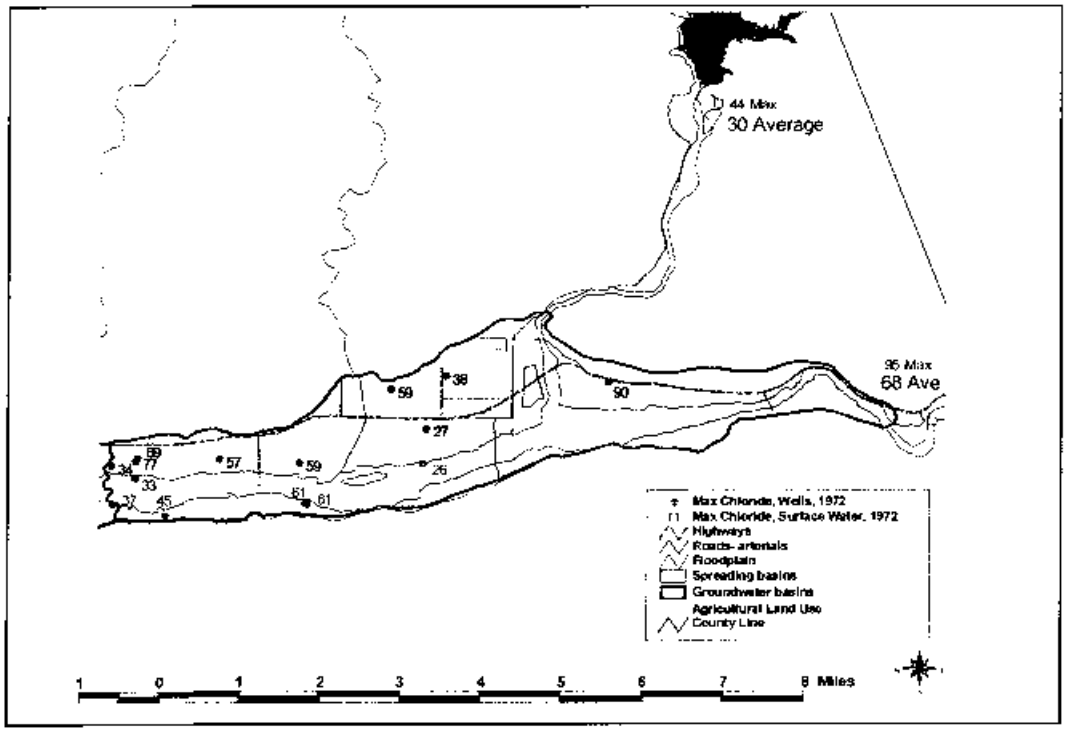
Map 2. Typical wet-year groundwater elevation contours, fall 1993.



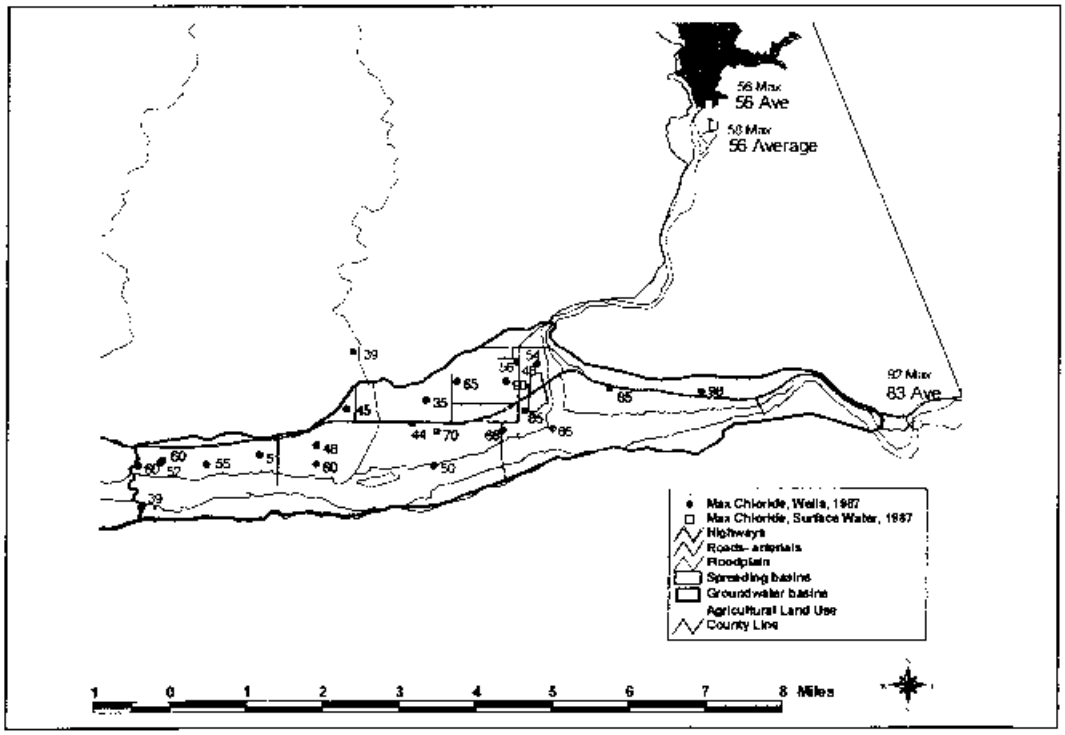
Map 3. Typical dry-year groundwater elevation contours, fall 2004



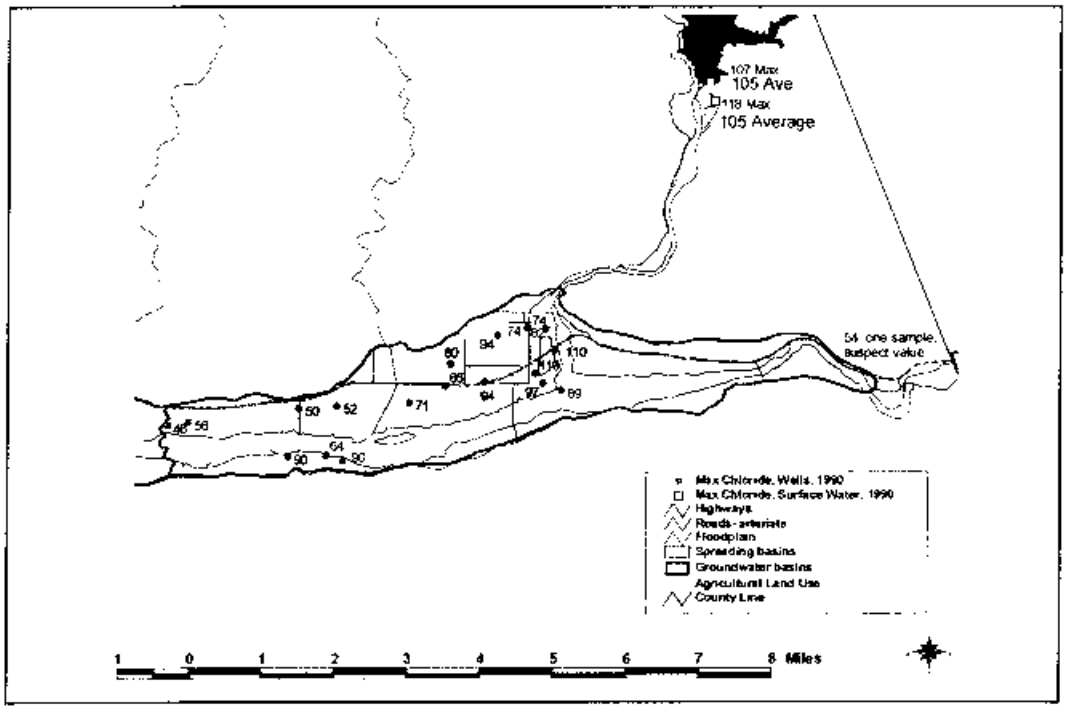
Map 4. Maximum-recorded chloride in wells and surface water, 1962.



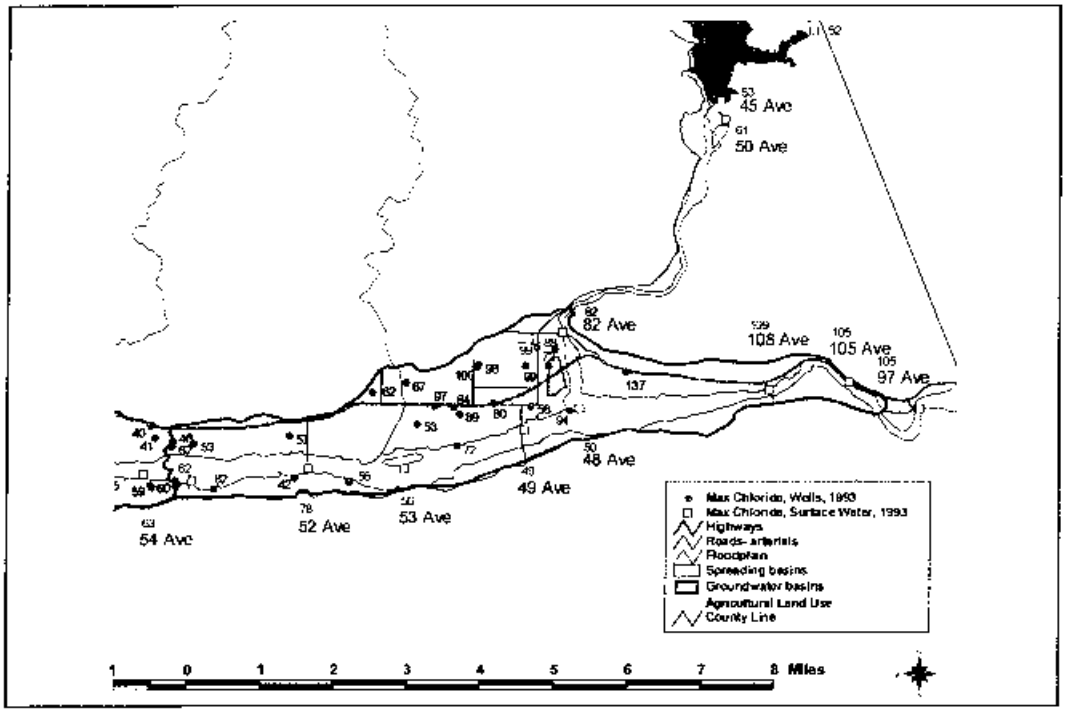
Map 5. Maximum-recorded chloride in wells and surface water, 1972



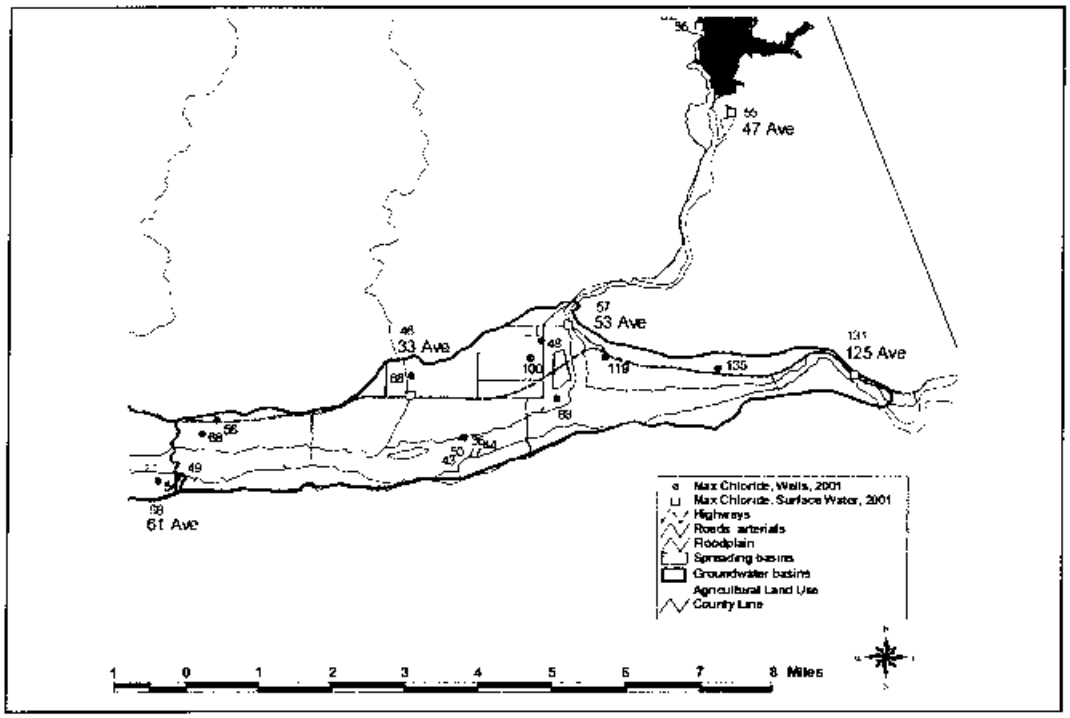
Map 6. Maximum-recorded chloride in wells and surface water, 1987



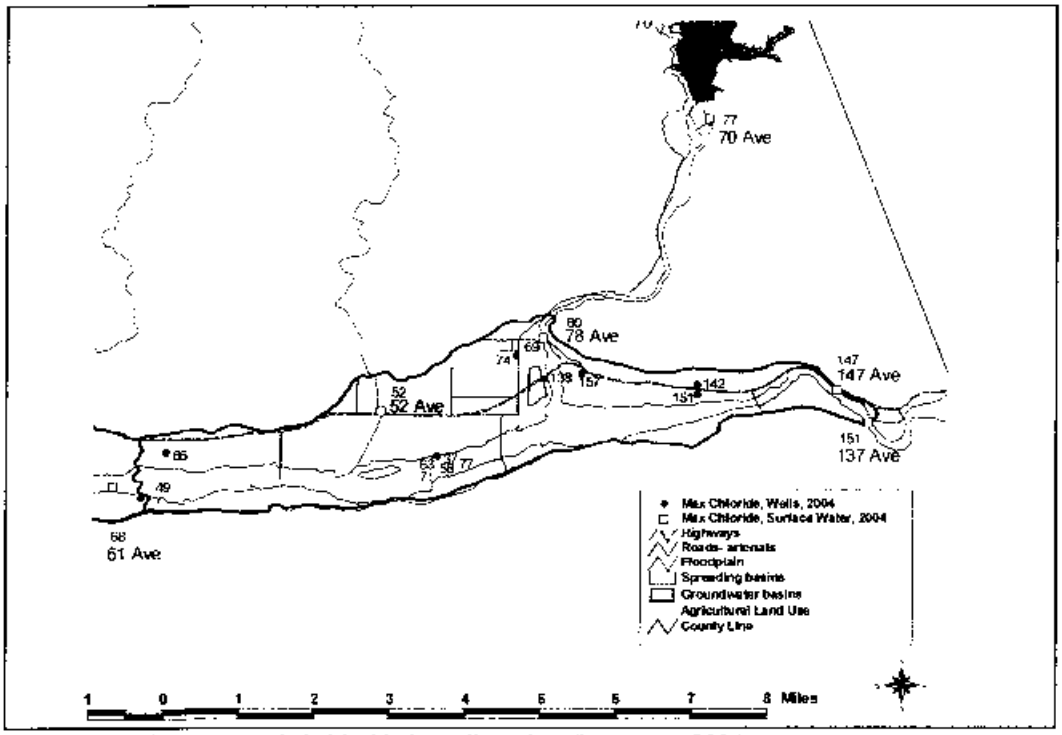
Map 7. Maximum-recorded chloride in wells and surface water, 1990



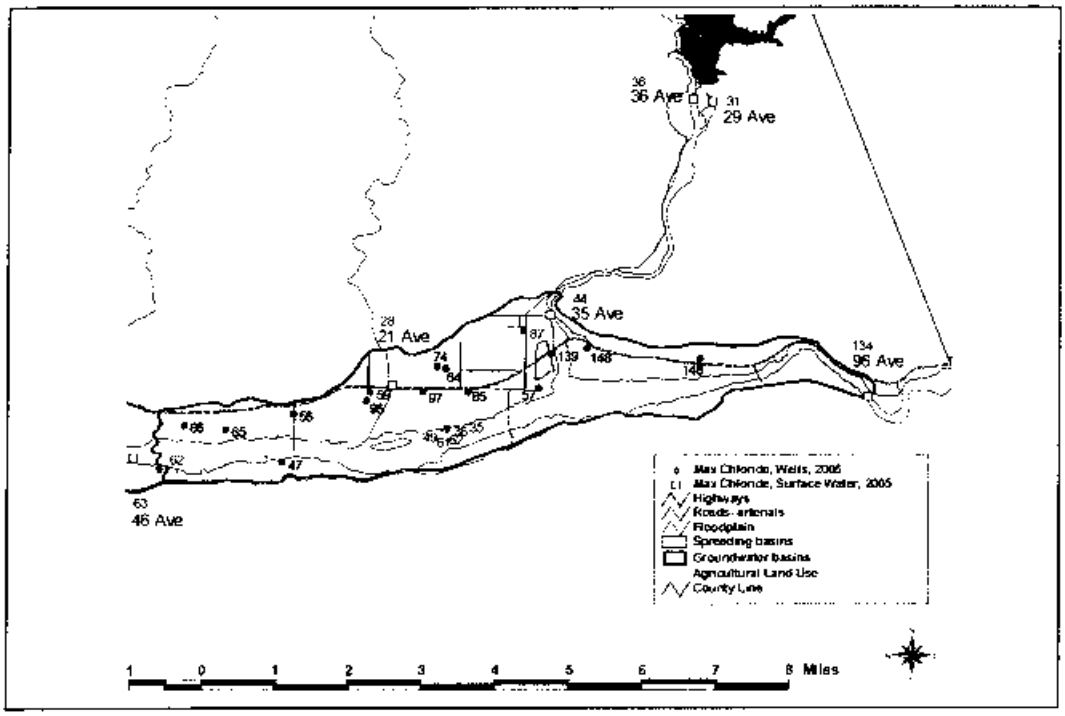
Map 8. Maximum-recorded chloride in wells and surface water, 1993



Map 9. Maximum-recorded chloride in wells and surface water, 2001



Map 10. Maximum-recorded chloride in wells and surface water, 2004



Map 11. Maximum-recorded chloride in wells and surface water, 2005

D23. Letter from Friends of the Santa Clara River, dated February 16, 2007

Response 1

Please see **Response 2** to letter from California Regional Water Quality Control Board, Los Angeles Region, dated January 22, 2007, which indicates that the Landmark Village project is well within TMDL limits for chloride. Furthermore, treatment at the Newhall Ranch WRP will consist of screening, activated sludge secondary treatment with membrane bioreactors, nitrification/denitrification, ultraviolet disinfection, and partial reverse osmosis. Effluent limitations on discharges to the Santa Clara River have been set at 100 mg/L.

As is discussed in the Newhall Ranch WRP NPDES Permit Fact Sheet (p. F-13), which is referenced in the **Introduction** to letter from California Regional Water Quality Control Board, Los Angeles Region, dated January 22, 2007, the Upper Santa Clara River chloride wasteload allocations (WLAs) are expressed on a concentration basis derived from and equivalent to the existing water quality objective for Reaches 5 and 6 of the Santa Clara River, thereby providing direct protection for sensitive beneficial uses. Under the TMDL Implementation Plan, a special study was conducted to confirm that the concentration-based WLA of 100 mg/L chloride is protective of this beneficial use. A concentration-based WLA also accommodates future growth and provides beneficial uses protection from chloride loads that were in place at the time of the TMDL development. Protection of beneficial uses from additional chloride loads that were not assigned wasteload allocations is provided by using the WLAs as effluent limits in permits for new and future sources, such as the Newhall Ranch WRP.

Further stated in the Fact Sheet (p. F-13), the Staff Report for the TMDL, dated August 21, 2002, states "A concentration-based target accommodates future growth by allowing increased mass as long as it is accompanied by additional flow… " The Fact Sheet finds that water quality will not be degraded if concentration-based wasteload allocations that are equivalent to the water quality objectives are assigned to new facilities at the end of pipe. The Fact Sheet also states that studies regarding the effect of additional chloride load on groundwater basins underlying the Upper Santa Clara River are underway and scheduled for completion by November 2007 (Fact Sheet p. F-14). Initial results from these studies show that discharges at effluent limits of 100 mg/L chloride will not degrade groundwater quality. In conclusion, the Landmark Village project will not result in significant water quality impacts.

Response 2

Please see **Response 2** to letter from California Regional Water Quality Control Board, Los Angeles Region, dated January 22, 2007.

Response 3

The comment is noted. No further response is required given that the comment does not address or question the content of the Draft EIR.

Letter No. D24

SCOPE
Santa Clarita Organization for Planning and the Environment
TO PROMOTE, PROTECT AND PRESERVE THE ENVIRONMENT, ECOLOGY AND QUALITY OF LIFE IN THE SANTA CLARITA VALLEY
POST OFFICE BOX 1182, SANTA CLARITA, CA 91386

2-16-07

Mr. Daniel Fierros/ Ms. Susan Tae
Los Angeles County Regional Planning Dept.
320 W. Temple St.
Los Angeles, CA 90013

Re: Newhall Ranch, Landmark Village (Project No. 00-196-(5)
Request for Continuation of hearing date and Extension of EIR Comment Period

Please copy to all commissioners

Dear Mr. Fierros and Ms. Tae:

It has come to our attention that two important sections of the Environmental Impact Report lack essential information that is required by the County of Los Angeles to process all entitlements. 1
They are the Development Monitoring System infrastructure analysis and the SB610/ SB221 water verification (see comments under **Water Supply**). 2 We therefore request that the public hearing scheduled for Feb.28th be continued and the comment period be extended so that this information may be provided and circulated. 3

Failure to Comply with the Los Angeles County Development Monitoring System

The Los Angeles County Development Monitoring System (DMS) came into being as a result of a court-ordered General Plan Amendment (SP-87). This amendment was approved to settle a case filed by Center for Law in the Public Interest and brought to ensure that infrastructure including schools, libraries, roads, fire, water and sewer service would be adequate to serve additional housing units while not reducing the existing level of service provided to existing residents. 4 SCOPE has previously argued, and continues to assert that Sheriff's services should also be a part of the DMS evaluation. 5

The DMS requires that each project in an urban expansion area analyze existing, pending, recorded and approved projects, along with the addition of the current project proposal, to ensure that the six infrastructure areas will be adequate to provide for the new project in addition to the previously approved projects. 6

In 1993, SCOPE was a party to successful litigation brought for inconsistency with this General Plan section against the Newhall Land and Farming's Westridge project. That litigation resulted in the project being set aside until agreements with school districts to provide adequate school funding were reached and a library assessment district to provide adequate library materials to serve new residents was established. 7

The DMS analysis for the project before you includes the first part of the General Plan requirement, i.e., it evaluates the number of existing, pending and recorded the infrastructure requirements for existing pending and approved projects. But the printouts in the EIR do not provide information as to the level of infrastructure service needed for these existing, pending and approved projects. For example, there is no information as to the level of sewage plant capacity (normally represented in millions of gallons) for existing, pending and approved projects. Nor do the printouts indicate the additional load that will be placed on each of these service areas by the new project. Without this information, the decision-makers cannot adequately assess the level of service available to current and future residents of the Santa Clarita Valley. There is no evaluation of the adequacy of fire, school, Library, water and sewage service in the face of the additional projects that have already been approved. Nor has traffic been evaluated under this system. 8 9 10 11 12 13 14

We have attached previous evaluation forms for other projects as an example of the information that should be provided to the decision-makers. (Attachment 1). The mere disclosure of the number of existing units in each of the service areas is meaningless. Thus, this EIR does not comply with the Los Angeles County Development Monitoring System. ***We request that this information be provided prior to further hearings on this project.*** 15 16

Lack of DMS Reporting of water availability

The EIR erroneously states that this project will be entirely served from Valencia's "agricultural water" that it "owns". Although the Newhall Land and Farming Company does have riparian rights for farming water along the Santa Clara River, riparian rights are not transferable to municipal uses. The Santa Clara River is an "unadjudicated" ground water basin. That means there has never been a legal proceeding to decide how much water each user may withdraw from the basin. It also means that Valencia Water Co, the wholly owned subsidiary of Lennar Corp., has NO rights to any particular amount of water. They are subject, like the other water companies, to a "Memorandum of Understanding" as to the safe yield of the Santa Clara River basin, but no party has any set amount that they may withdraw from the basin. Newhall/Lennar has been stating for quite some time that they will supply the many projects for which they have received entitlement approvals since 2000 (app.8,000-9,000 units) from the water currently being used for agriculture. Yet the amount of water used for agricultural remains listed at the same level. It is therefore imperative that a current DMS analysis be conducted for this project, both to ensure an adequate water supply for this future community and existing residents as well as to comply with consistency requirements for the Los Angeles County General Plan. 17

Inadequacy of Sheriff Services under the DMS

According to page 4.13.1 the sheriff's department stated that an additional 15 deputies would be required for the project. This is consistent with a report the Sheriff's Dept. produced for the needs of Westside services in 1999 (Attached 2). The EIR preparer claims that only four would be required and relies on a letter from the Sheriff's department in 2004 stating that estimated current response times would fall into the acceptable time categories. ***However, these estimates were made at a time when no housing exists in the project!*** Further, ***estimates were made based on the then current (2004) population and traffic in the Santa Clarita Valley.*** After a housing boom that has substantially increased traffic and population in this area, these projections are no longer valid. 18 19 20

We therefore believe the County should evaluate this service need as part of the DMS in order to project the needed officers for the amount of existing housing approvals so that adequate mitigation can be required. 21

In addition, the mitigation for the required new sheriff's officers is to provide them out of the tax base generated by the new development. If that is to occur, there should be an evaluation of the property tax generated to see if it will be sufficient to provide for new officers. There is no fiscal evaluation of the sufficiency of funds to provide for new officers, nor is there any mitigation measure devoted to directing tax funds specifically to the Sheriff's Department. Therefore, the proposed mitigation for this shortfall seems to be infeasible. 22

Inadequacy of School classroom space under DMS

The William S. Hart Union High School District has been unable to provide adequate school capacity for students from already developed areas. They are currently in financial difficulty and unable to built schools promised in the previous bonds passed by voters. We request that current information on this issue be disclosed in the EIR. 23

Water Supply

The water section of this Environmental Impact Report is incomplete. At the tract map approval stage, the County of Los Angeles requires that a project proponent to supply both an SB661 Water Assessment and a SB221 Water Verification. The Dept. of Regional Planning requested these two documents on January 27, 2004 and Jan 6, 2005 (correspondence attached 3). The only such report included in the EIR is a draft 610 assessment, not even a final assessment! The Dept. of Regional Planning may not rely on a draft document for approval. 24

Since the requirements of SB221 are more stringent, including the necessity for actual contracts and permits to show water availability, it is important that the project proponent comply with the County's request prior to consideration of this proposal. We therefore request that the Feb 28th hearing be delayed until the developer and Lennar Corporation have fully complied with the County and State requirements regarding water supply and that this information be circulated to all interested parties. 25

Further, the California Public Utilities, the regulating oversight governance for Valencia Water Co., stated in its Decision D.0111048, Nov. 30th, 2001 that:

> "If Valencia proposes to expand its service area to serve the Newhall Ranch Specific Plan, or any part of it, Valencia shall file an application requesting authority to expand its service area, and provide an updated Water Management Program and advice letter covering any such service area expansion."
> (Decision at Page 46, cover and cited page attachment 4)

26

Since to our knowledge, no updated Water Management Program has been provided or approved, we believe that the above is an indication that this proposal currently does not comply with the requirements of SB221. 27

Ammonium Perchlorate Pollution in the Saugus Aquifer

A recent decision in the California Supreme Court, *Vineyard Area Citizens for Responsible Growth, Inc. et al. v. City of Rancho Cordova*, Case No. S132972 makes clear the Court's direction on long-term water analysis and disclosure requirements for such an analysis. We do not believe that this EIR complies with the requirements of this decision in that it makes no disclosure of the possibility of delays in the permitting and building of the ammonium perchlorate clean-up facilities. The indicated pumping from the Saugus Aquifer cannot be accomplished with out the return to service of the wells that are currently closed due to ammonium perchlorate pollution. Construction of this 28 29 30

project was originally scheduled to begin in 2005, but has consistently been delayed (see CLWA Agenda item attachment 5 indicating construction will begin 10/06 and a current agenda item indicating the schedule has slipped to 1/08. Both the Vineyard decision and the 5th Appellate Court decision that set aside the Santa Clarita Valley water purveys' 2000 Urban Water Management Plan (*Friends of the Santa Clarita River v. Castaic Lake Water Agency*), require a timeline for re-instatement of this water if reliance upon it is indicated as a source of supply and an alternative source in case the supply is not forth coming. Such analysis is important to the decision making process because Castaic Lake Water Agency intends to rely on water pumped from the Newhall Ranch area ground water in case of emergency need. This means that they will be drawing from the same ground water source identified for this project. 30 31

In the meantime, the study for this project conducted by the Army Corps of Engineers concluded that the pollution plume was moving in a westerly direction. It detected extremely high pollution levels in some areas (see attachment 6). The pollution plume also migrated to another Newhall County Water District Well (NCWD 13), causing its temporary closure. (news article included in previous attachment.) 32

The chart on page 4.10-30 depicting well capacity for the Saugus aquifer is incorrect since well # 159 was destroyed due to ammonium perchlorate pollution. Also, maximum pumping capacity of a well should not be used as an indication of how much water can actually be supplied from that well due to other limitations such as maintenance and distribution capabilities. A better indication of water supply capability is the amount actually pumped from each well on a yearly basis. This table should be updated to include that information. 33 34

We concur with other commentors that the 41,000 AF Monterey Amendment water transfer identified in the EIR as part of the total water supply may not be relied upon for SB221 purposes since the environmental documentation is not complete. Although the EIR claims that it will not rely on this water, in a drought the project may have no other choice. Alternatively, a cut back in state water supply may require that the existing residents be supplied with ground water from the project area. Such scenarios must be disclosed and considered in this EIR in light of the Vineyard decision. 35 36

In a Court supervised settlement where the litigants, including SCOPE, agreed to drop their appeal of the Specific Plan for this project, Newhall Land agreed to identify the farming acreage that would be retired to support the water usage for each tract map. This stipulation is also a condition of the Specific Plan (SP4.11.22). Newhall Land also agreed to identify how the water usage on that acreage was calculated and provide documentation of such. We do not see this information in the EIR. 37

Due to the controversy and litigation surrounding water supply for this project, the Specific Plan placed several other conditions on the project's tract map approvals regarding water supply. Compliance with those conditions, if it exists, should be disclosed and discussed in the EIR. 38

Use of Recycled Water

We believe this project represents an opportunity to use recycled water in much more creative and truly conservative uses than just application on a golf course. We request that the developer explore the use of recycled water for all public medians, open space areas and home gardens. We realize that the Dept. of Health Services does not currently allow the use of gray water for local 39

landscaping. But should this development be approved, we would like to work with the developer to try to include this option wherever possible. 39

Water Quality Issues

The effluent produced from the LA County Sanitation Districts already fails to comply with limits for chlorides (see attached RWQCB Complaint and excerpts from their slide presentation to the City of Santa Clarita attachment 7). Please indicate how this project will avoid increased releases of this unpermitted pollutant into the Santa Clara River and appropriate mitigation to avoid increased releases. 40

Federal Army Corps Permit and State Streambed Alternation permit EIR/EIS should proceed this approval

We continue to request that this entitlement process NOT proceed until after the completion of the EIR/EIS for required permits affecting the Santa Clara River. That document has not yet even been released. We believe that this process should not proceed the release of that document because impacts identified and mitigated for those federal and state permits may very well affect the design of the project before you. The Army Corps/DFG EIS/EIR should be completed first, mitigation measures adopted, and special permit conditions approved, before this project is approved. The current sequencing risks greater delay than if the Landmark project were stayed pending completion of the EIS/EIR and issuance of the Army Corps/DFG permits, which is the proper sequence. 41

Inconsistency with the Regional Water Quality Control Board Hydromodification Resolution and requirements for a 401 permit

In February of 2005 the Los Angeles Regional Water Quality Board passed a resolution expressing its intent to vigorously enforce permitting under its jurisdiction through its enabling legislation (resolution attached). Despite extensive bank stabilization and floodplain development, the EIR does not evaluate the project's consistency with the RWQCB's Hydromodification Resolution. (Attachment 8). The Regional Board will need to issue a 401 certification in connection with the project, and has indicated that it will look closely at all future hydromodification projects to ensure they evaluate the required range of alternatives. Here, the project fails to consider eliminating or reducing downstream bank stabilization and eliminating the Long Canyon Bridge. 42 43

Geology and Soils

We request that the Commission carefully read and evaluate the enormous amount of fill to be placed under some of the housing units in this project. We believe that amount of fill will prove to be unsafe, particularly in liquefaction areas. In fact, settling that is resulting in damage to homes is already occurring in fill areas next to San Francisquito Creek where similar fill patterns were utilized 44 45 46

The public believes that the County approval process will protect it from such defects. They do not go down to the Public Works Department to investigate the stability of the lot on which their home is built before they purchase it. Therefore, if the County intends to approve projects that are built on substantial amounts of fill dirt, we request that notification of such be required in large (14 pt) bold type in the Real Estate Purchase Agreement so that the public may be aware of exactly what they are purchasing and act accordingly. 47

We concur and incorporate by reference the comments of other organizations expressing concern over impacts to habitat and species in this sensitive area. The only way that these impacts can be 48

reduced is through greater avoidance. Many of the impacts could be reduced or avoided by eliminating the downstream bank stabilization and the Long Canyon Bridge. Other permanent impacts (oak woodland, riparian forest, etc.) could be avoided by alterations in the project footprint. For instance, the EIR should consider alternatives that drop the downstream bank stabilization and the Long Canyon Bridge and alternative footprints that avoid the necessity for removing the 67 oaks. Moving oaks does not result in a high survival rate in the Santa Clarita Valley and many are merely removed at a later date under some kind of emergency process that excludes public participation. 48 49

SCOPE continues to oppose building in the Significant Ecological Area. The specific plan for this project already substantially reduced the area of SEA 23, the Santa Clara River. We request that no further reduction be allowed and that the original buffer along the Santa Clara River be restored. 50 51

The proposed mitigation measures will not reduce these impacts to less than significant levels. Fuel modification features of the project are not adequately described in the project description, nor the effects of fuel modification zones sufficiently accounted for in the impact analysis. Instead, the EIR defers development of the fuel modification plan until later, making it impossible to determine the true impacts to habitats of the project. 52 53

Unwarranted Bank Stabilization Proposals

The downstream bank protection on the south bank should not be included as part of the Project Description. As the EIR indicates, it is a mitigation measure for the project's impacts. But when those impacts are analyzed, it turns out that they are localized and less than significant. One mile of bank protection that will clearly serve future development is not proportionate to the impacts disclosed in the EIR. The bank protection component should be removed from the project description and evaluated as a mitigation measure. Because the bank stabilization will itself result in significant temporary and permanent impacts to riparian vegetation, less damaging and more proportionate mitigation should be considered for the project's localized impacts, if such impacts are significant at all. 54

A similar argument applies to the bank protection for the utility corridor on the north bank. Localized velocity impacts may require localized bank protection solutions, but they don't require another nearly one mile segment of bank protection. 55

The EIR should consider alternatives that drop the downstream bank stabilization and the Long Canyon Bridge. The Long Canyon Bridge is not an essential part of the project and should be dropped from the Project Description. Its only purpose is to serve future development that has not been approved. Its environmental effects can still be considered in the cumulative impact analysis. 56 57

We re-iterated again that this entitlement process should NOT preceed the Army Corp/DFG EIR/EIS process, as the above modifications may not be approved anyway. 58

Significant Impact to Solid Waste

We do not support the expansion of Chiquita Canyon Landfill as the neighboring communities have already been severely impacted by that facility. Further expansion will now impact even more nearby residents if this project is approved. We believe compliance with AB939 and aggressive recycling on the part of the adjacent jurisdictions will alleviate much of the need for expansion. 59

However, should expansion be approved anyway, we request that future residents of the Landmark project be notified in their real estate agreements in 14-pt type of the intention to expand the landfill. 60

We also believe that a large piece of open space area comparable to Central Park in the City of Santa Clarita should be donated as mitigation for that expansion. Donating portions of the floodplain or SEA currently slated for development in the Landmark project might be considered. 61

Traffic

The project does not identify the substantial impacts to the I-5 corridor. This corridor is already at a service level of F between the hours of 6 AM and 9AM and 3:30PM and 7PM. Newhall Pass acts as a choke point where traffic generated by substantially increased development approvals along the Hwy. 14 meet the I-5. The additional trips generated by this project cannot be supported by the existing infrastructure. This fact should be disclosed in the EIR. 62

Further, the very mitigation that would resolve this issue has been eliminated. We believe that this project should not be approved without the re-instatement and commitment to funding of a rail right of way and a commuter rail service. 63

Further, Highway 126 will require widening to accommodate future buildout of this project, but this project proposes building in areas that would later have to be condemned for such a widening. 64
Condemnation proceeding would occur only at great cost to the public and disruption to merchants 65
that have begun their businesses in this area. We therefore request that highway right of way be included in this project to accommodate the 357,000 per day estimated future commuters. 66

Global Warming

In an attempt to control greenhouse gases, the State of California recently passed AB32. A major source of greenhouse gas emission is the automobile. This project proposes to add 357,000 trips per day at build out. Nowhere does the EIR evaluate this project's contribution to global warming. Nor does it evaluate the cumulative impacts of such auto-related land use. The EIR must at the very least, evaluate the project's contribution to greenhouse gas emissions. Feasible measures exist to reduce or avoid these impacts and must be considered in the EIR. 67

Sincerely,

Lynne Plambeck
President

Enclosure: Attachments as indicated in the text

OVERVIEW

87-222-(5)

NEED FOR DMS:

1. Development Policy Map Designation: 4 – Urban Expansion
   7 – Non-Urban Hillside
2. Is the project located in the Antelope Valley, East San Gabriel Valley, Malibu/Santa Monica Mountains, or Santa Clarita Valley Planning Area? ☒ Yes ☐ No
   (if yes, circle which area)
3. Is the project an urban demolition and located within, or proposes a plan amendment to, an urban expansion designation? ☒ Yes ☐ No

IF BOTH QUESTIONS ARE ANSWERED "YES," A DMS ANALYSIS IS NECESSARY. CONTINUE WITH THIS OVERVIEW.

A. INFRASTRUCTURE CRITERIA:

	SERVICE	WATER (ACRE FEET/YEAR)	SANITATION (MILLION GALLONS/DAY)	SCHOOLS (CLASSROOMS)			LIBRARY
DEMAND	AGENCY NAME	Valencia Water Company	Sanitation Dist. Nos. 26 and 32	Elementary Saugus Union	Intermediate Hart Jr. Hi.	Secondary Hart Sr. Hi.	Valencia
	CURRENT USE	14,667	13.70	183.9	129.1	229.4	78,065
	RECORDED DEMAND	1,524	1.12	21.1	11.3	22.5	12,208
	APPROVED DEMAND	2,996	2.30	1.7	13.1	37.4	19,194
	SUBTOTAL	19,187	17.12	206.8	153.5	289.3	109,467
	PROJECT DEMAND	1,050	0.56	16.4	5.4	10.7	7,479
	TOTAL DEMAND	20,237	17.68	223.2	158.9	300.0	116,946
SUPPLY	CURRENT SUPPLY	25,500	19.10	131.0	108.0	203.0	74,699
	ADDITIONAL SUPPLY	–	–	–	–	–	–
	TOTAL SUPPLY	25,500	19.10	131.0	108.0	203.0	74,699
	IS SUPPLY ADEQUATE?	~~No~~ Yes	Yes	No	No	No	No

006359

Fire Department: Identification of nearest Fire Station: 173 Distance to Fire Station: 2.0 mi. Fire Department Threshold Distance: 1.5 mi.

1. Is the project within acceptable distance? ☐ Yes ☒ No

IDENTIFY INFRASTRUCTURE (LISTED ABOVE) MITIGATION MEASURES, IF NECESSARY, IN MITIGATION BOX (OVER).

1990 Westridge EIR

TABLE E-5: PROJECTED GROWTH IN WATER DEMAND
IN VALENCIA WATER DISTRICT

YEAR	PHASE	POPULATION (1)	PERCENTAGE OF TOTAL POPULATION INCREASE	WATER DEMAND INCREASE (MGD)(2)	INCREASE BY PROJECT BUILDOUT (AF/YR)	TOTAL FUTURE DEMAND (3)	ASSURED WATER SUPPLY
1988		126,667				14,667	22,000
1989		133,333	4.65%	738.6		15,406	22,000
1990		140,000	4.65%	738.2		16,144	22,000
1991		147,000	4.88%	775.0		16,919	25,500
1992		154,000	4.88%	775.0		17,694	25,500
1993		161,000	4.88%	775.0		18,469	25,500
1994		168,000	4.88%	775.0		19,244	25,500
1995		175,000	4.88%	775.0		20,019	25,500
1996	buildout	182,000	4.88%	775.0	6,127	20,794	25,500
1997		189,000	4.88%	775.0		21,569	25,500
1998		196,000	4.88%	775.0		22,344	25,500
1999		203,000	4.88%	775.0		23,119	25,500
2000		210,000	4.88%	775.0		23,894	25,500
2001		216,000	4.19%	664.3		24,558	25,500
2002		222,000	4.19%	664.3		25,222	25,500
2003		228,000	4.19%	664.3		25,887	25,500
2004		234,000	4.19%	664.3		26,551	25,500
2005		240,000	4.19%	664.3		27,215	25,500
2006		246,000	4.19%	664.3		27,880	25,500
2007		252,000	4.19%	664.3		28,544	25,500
2008		258,000	4.19%	664.3		29,208	25,500
2009		264,000	4.19%	664.3		29,872	25,500
2010		270,000	4.19%	664.3	9,743	30,537	25,500
TOTAL			100.00%	15,870	15,870		

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(1) Source: Staff Report on Plan Amendment # SPA 87-275, 8/19/87. Projections given for years 1987, 1990, 2000, and 2010; populations for other years were estimated.

(2) Source: Water demand assumed to grow at same rate as population, therefore: yearly water demand increase = the % of population increase x total water demand increase (15,870 AF/YR).

(3) Source: 1988 and 2010 water demand from DMS Analysis, 6/01/89, and Zoned District Report, 9/27/89, for ZCs & PAs.

004206

TABLE III-4B
PROJECT-GENERATED WATER DEMAND

LAND USE	DU, STUDENTS, OR NET ACRE	GENERATION FACTOR (AF/YR) (1)	DEMAND (AF/YR)	EXISTING DEMAND (AF/YR)(1)	EXISTING + PROJECT DEMAND (AF/YR)	EXISTING CONDITIONS: CAPACITY (AF/YR)	EXISTING CONDITIONS: REMAINDER /DEFICIT (AF/YR)	FUTURE CONDITIONS: CAPACITY (AF/YR)(1)	FUTURE CONDITIONS: REMAINDER/ DEFICIT (AF/YR)
Single Family	1,221	0.59 per DU	720						
Multi-family	718	0.25 per DU	180						
Elem. school (2)	660	0.03 per student	20						
Commercial	31.1	4.40 per acre	137						
Golf Course/ Graded Slopes	192.0	(3)	770						
TOTAL			1,827	14,667	16,494	22,000	5,506	25,500	9,006

(1) Source: Los Angeles County Department of Regional Planning, DHS Inventory Information for Water Service, 6/01/89.
(2) Per conversation with Art Clark, new elementary schools will be built to hold approximately 660 students.
(3) Generation factor = acres * average daily demand * days/year /1,000,000 * 3.069 AF/YR
= 192 acres * 3,578 gal/acre/day * 365/1,000,000 * 3.069
= 769.5 AF/YR

003562

- Informational Briefing-

Development of the Westside

The Impact on Police Services

Captain Donald A. Rodriguez

Santa Clarita Valley Station

March 16, 1999

Development on the "Westside"

The purpose of this report is to provide a brief overview regarding the development of the "Westside" of our station area. This geographical zone encompasses the area from the boundaries of the City of Los Angeles north to Highway 126. The western boundary runs along the Ventura County line, the Pico Canyon Oil development of the Chevron Corporation and the City of Los Angeles. Basically, it eastern border runs for ten miles from the 14/I-5 split along the I-5 Freeway to Highway 126. The piece of land, in size, is mostly rural, but will contain the largest areas of development for our station geographical boundaries. (See an included map)

There are four major residential development projects in the area. They are Sunset Pointe, Stevenson Ranch, Westridge and Newhall Ranch.

Sunset Pointe

Sunset Pointe is the oldest of the projects. Development began in the early 1980's and will be completed this year. The primary land developer was the Larwin Corporation. The project is 1,200 housing units made up of single family dwellings, condominiums and apartments. The approximate population is 3,600 people. There is a small commercial district. The main portion of the commercial district is three major motor motels.

The project's northern boundary is Pico Canyon Road and its southern boundary is appromately the extension of Calgrove Boulevard. Its eastern boundary is the I-5 freeway and its western boundary is approximately two miles west of the freeway.

This area received major damage during the 1994 Earthquake. The main fissure ran the length of the project and very few homes were not damaged severely.

Stevenson Ranch

Stevenson Ranch is the next area north of Sunset Pointe. It is the second largest development in the area. It will have a single commercial area of one million square feet, but that will be completed near the end of the project. At build-out, there will be approximately 5,800 residential units.

The project's southern boundary is Pico Canyon Road and it will run north to the extension of Valencia Boulevard. The eastern boundary is the City of Santa Clarita or the I-5 Freeway. The western border is the property line of the Chevron Corporation Pico Canyon Oil property.

This area's primary developer was the Dale Poe Corporation. Unfortunately, Mr. Poe was killed in a single car traffic collision several years ago. Lennar Homes purchased the parcel and is now the primary developer.

Currently, about 2,300 residential units are completed. It is estimated that an additional 3,500 residential units will be finished at build-out. These units will include single family dwellings, condominiums and apartments. At build-out, approximately 17,400 people will occupy this area.

Westridge

The Westridge project was recently before the Board of Supervisors and is near final approval, but there are some minor legal challenges to overcome. Grading for this project is expected to begin soon. Westridge is being developed by Newhall Land and Farming Company and at build-out, there will be 1,712 housing units adding approximately 5,100 people to the area. A major golf course will be a part of this development.

Westridge's boundaries are somewhat hard to define. The southern border will be along the extension of Valencia Boulevard, but will extend along The Old Road to Mc Bean Parkway. The eastern boundary is the I-5 Freeway. The western boundary runs about a mile west of the freeway.

Newhall Ranch

This will be the largest project. It is being developed by the Newhall Ranch Company, a division of Newhall Land and Farming, and will add a total of 22,000 housing units for 66,000 people. The final plan is before the Board of Supervisors and it is expected to be approved this month. The project will face major legal challenges. Be that as it may, grading for the project is expected to begin within four years. The build-out for this project is 25 years.

The southern border for this project is the extension of Valencia Boulevard. The northern boundary runs mostly along Highway 126. The eastern border is the I-5 Freeway and the western border is approximately the Ventura County line. The project encompasses approximately 11, 963 acres.

Commercial Projects

The commercial projects will mostly follow "The Old Road." This is a road that parallels the I-5 Freeway's west side, running from Calgrove Boulevard to Highway 126. Valencia Marketplace is the largest of these projects. It is one mile long and features several major retail stores including Walmart, Toys-R-Us and Circuit City. Also, there are several popular eating establishments including Chuckie Cheese, The Macaroni Grill and Claim Jumpers.

Near the completion of the Stevenson Ranch project, a one million square foot commercial area will be developed. This development will run along Valencia Boulevard.

Summary

These projects will add a significant population to the area. Currently, the total population for this area is approximately 7,000. Stevenson Ranch will add approximately 3,500 more housing units, Westridge another 1,712 and Newhall Ranch, 22,000. This means that within the next 25 years, the "build out" time, a total of 27,212 housing units will be added to this area. Using an average number of three persons per household, a total of 81,636 people will be added to the area, for a total of 88,636 people, a 1,166% increase. Most of the housing is planned for moderate to upper income families.

Police Services

Much public interest has been expressed as to the impact of municipal services in the area. The specific concern is police service. The Sunset Pointe project and Stevenson Ranch environmental impact reports were written in the early 1980's. The calculations of police services needs were made based upon the initial population figures, but the reports are no longer in our possession. The Westridge project was updated in March 1998. The report used the old calculation of one police officer for every 1,000 persons. This report means that only five additional police personnel were requested.

The calculations for the Newhall Ranch project were quite different. In 1996, two lieutenants took the populations figures and projected the actual police services based upon a similar population in the area. The comparison used was the City of Santa Clarita because the target housing products were geared toward a similar marketing population. In terms of 1996 dollars, the City of Santa Clarita was spending $77.68 per capita for police services. This includes full service for both general law and traffic services. The general law per capita cost for the Newhall Ranch project was estimated at $55.39. At build out, the following personnel classifications would be needed to provide adequate police services in Newhall Ranch:

- 2.5 sergeants
- 17.0 patrol deputies
- 3.0 non-patrol deputies
- 3.0 detectives
- 3.0 Desk Operations Assistants
- 1.0 Community Services Officers
- 3.5 Station Clerks
- 2.0 Telephone Operators

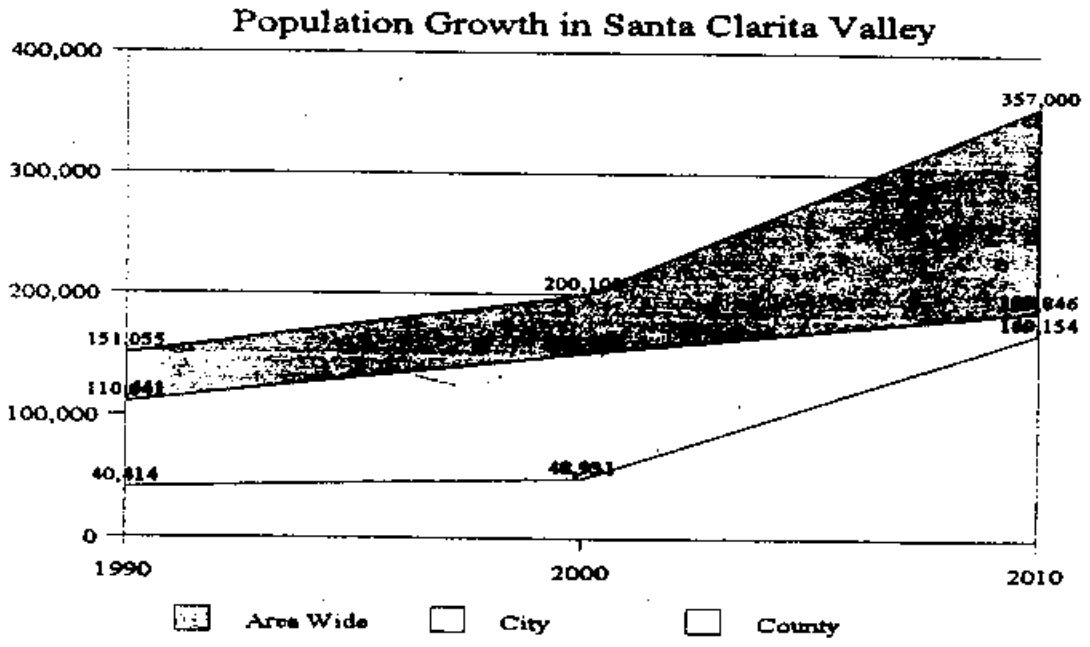
The annual cost in 1996 dollars at the build out would be approximately $3.8 million. Besides personnel, we also considered the needs of shotguns, vehicles, and other supplies and equipment.

POLICE SERVICE FACILITY

The one factor that was not addressed in any environmental impact report is our need for new facilities. The current station was built in the early 1970's and was designed for about 150 personnel. We currently have over 200 personnel assigned and we have no place to expand. Projecting into the future, we need to either build another major facility similar in size to the current physical plant or build a large facility that would be capable of housing over 400 personnel. This is a major political issue in that the City of Santa Clarita desires that we be located inside the city. Their master plan has a site for a large police facility, but that project has been placed on hold. If we acquire land outside the city to build a major facility, the contract could be in jeopardy. Initially, the Poe Development Company, initial developers of Stevenson Ranch, offered land for a major station. The City strongly opposed our move.

The Valencia Marketplace, the Stevenson Ranch commercial area and Newhall Ranch will provide storefront locations. The Valencia Marketplace's location remains vacant because we do not have enough personnel to staff it. Storefront operations will extend the life of any current police facilities, but there still will remain a need to build an additional large facility.

Even with the increase in calls and crime in this area, we are still holding our own in terms of staffing. But, the building companies are constructing residential units at the rate of 6,000 per year. This means that 18,000 more people reside in our area each year. The below graph indicates the population growth through the year 2010:



CURRENT "WESTSIDE" POLICE ACTIVITIES AND CRIME STATISTICS

STATION'S AREA

	1997	1998	% Change
• Total Calls	**39,727**	**40,123**	**+0.9%**
• Westside	**2,719**	**3,132**	**+15.2%**
• % of Whole	**6.8%**	**7.8%**	**+14.7%**
• Total Part I Crimes	**3,862**	**3,870**	**+0.2%**
• Westside	**235**	**324**	**+37.8%**
• % of Whole	**6.1%**	**8.4%**	**+37.7%**

WESTSIDE AREA

	1997	1998	% Change
• Calls for Service	**2,719**	**3,132**	**+15.2%**
• Part I Crimes	**235**	**324**	**+37.8%**

RESIDENTIAL AREAS

	1997	1998	% Change
• Part I Crimes	**104**	**123**	**18.3%**

COMMERCIAL AREAS

	1997	1998	% Change
• Part I Crimes	**131**	**201**	**53.4%**

RESIDENTIAL AREAS

SUNSET POINTE

Year	Homicide	Rape	Robbery	Aggravated Assault	Burglary	Larceny	Grand Theft Auto	Arson	Total
1997	0	0	1	10	5	29	8	2	55
1998	0	0	2	9	17	30	9	1	68
Difference	0	0	+1	-1	12	1	1	-1	13
% Change	0%	0%	100%	-10%	240%	3%	13%	-50%	24%

STEVENSON RANCH

Year	Homicide	Rape	Robbery	Aggravated Assault	Burglary	Larceny	Grand Theft Auto	Arson	Total
1997	1	0	1	4	18	20	5	0	49
1998	0	0	1	10	21	19	4	0	55
Difference	-1	0	0	6	3	-1	-1	0	6
% Change	-100%	0%	0%	150%	17%	-5%	-20%	0%	12%

COMMERCIAL AREAS

NORTH I-5 CORRIDOR AREA

Year	Homicide	Rape	Robbery	Aggravated Assault	Burglary	Larceny	Grand Theft Auto	Arson	Total
1997	0	0	2	7	0	19	13	1	42
1998	0	0	5	7	4	31	11	0	58
Difference	0	0	3	0	4	12	-2	-1	16
% Change	0%	0%	150%	0%	400%	63%	-15%	-100%	38%

THE VALENCIA MARKETPLACE

Year	Homicide	Rape	Robbery	Aggravated Assault	Burglary	Larceny	Grand Theft Auto	Arson	Total
1997	0	0	2	0	4	18	1	0	25
1998	0	0	7	0	11	20	5	0	43
Difference	0	0	5	0	7	2	4	0	18
% Change	0%	0%	250%	0%	175%	11%	400%	0%	72%

MAGIC MOUNTAIN

Year	Homicide	Rape	Robbery	Aggravated Assault	Burglary	Larceny	Grand Theft Auto	Arson	Total
1997	0	0	0	4	4	44	12	0	64
1998	1	1	2	11	6	69	10	0	100
Difference	1	1	3	7	2	25	-2	0	36
% Change	100%	100%	200%	175%	50%	57%	-17%	0%	56%

COUNTY AREA STAFFING

SANTA CLARITA VALLEY STATION
COUNTY DEPLOYMENT

EARLY MORNING SHIFT

•	UNIT 66	TWO DEPUTIES	WESTSIDE
•	UNIT 65	TWO DEPUTIES	EASTSIDE

DAY SHIFT

•	UNIT 65*	TWO DEPUTIES	EASTSIDE
•	UNIT 66	ONE DEPUTY	WESTSIDE
•	UNIT 67	ONE DEPUTY	WESTSIDE
•	UNIT 68	ONE DEPUTY	GORMAN
•	UNIT 68K	ONE DEPUTY	GORMAN
•	UNIT 60H1	ONE DEPUTY	PYRAMID LAKE
•	UNIT 60H2	ONE DEPUTY	PYRAMID LAKE
•	UNIT 66D	ONE DEPUTY	VAL VERDE YOUTH PROGRAM

•	COMMUNITY RELATIONS	ONE DEPUTY	
•	RESERVE COORDINATOR	ONE DEPUTY	
•	Y.A.L. COORDINATOR	ONE DEPUTY	VAL VERDE

PM SHIFT

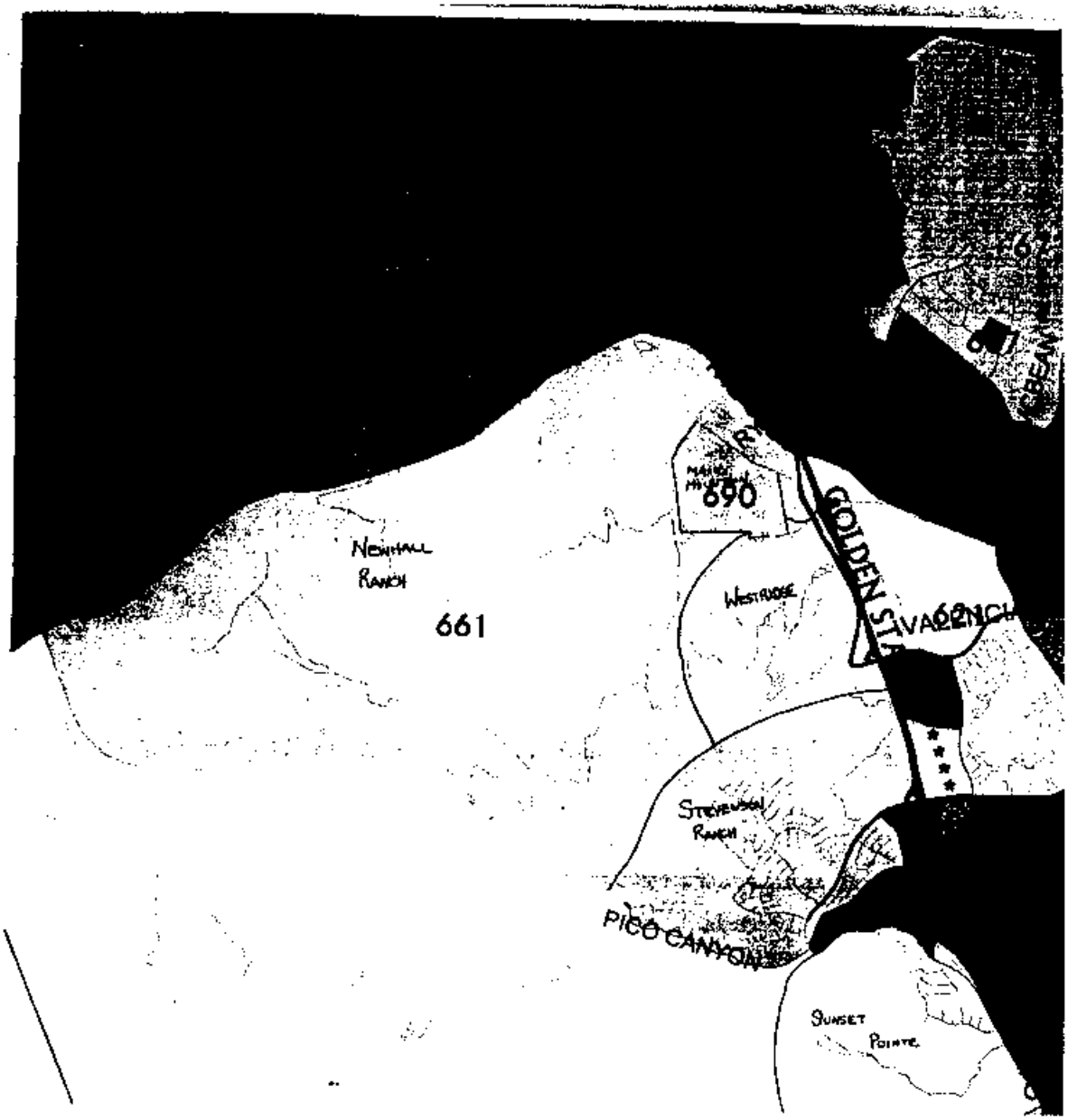
•	UNIT 65*	TWO DEPUTIES	EASTSIDE
•	UNIT 65A	ONE DEPUTY	EASTSIDE
•	UNIT 66	TWO DEPUTIES	WESTSIDE
•	UNIT 66B	TWO DEPUTIES	WESTSIDE
•	UNIT 68K9	ONE DEPUTY	WESTSIDE & EASTSIDE

*TRAINING CAR

COUNTY COPS TEAM

- SERGEANT
- TEN DEPUTIES

** BETWEEN MEMORIAL DAY AND LABOR DAY, FOUR COPS DEPUTIES ARE REASSIGNED TO PYRAMID LAKE**


690
NEWHALL RANCH
661
WESTRIDGE
GOLDEN STATE
VALENCIA
STEVENSON RANCH
PICO CANYON
SUNSET POINTE

COUNTY AREA STAFFING

SANTA CLARITA VALLEY STATION
COUNTY DEPLOYMENT

EARLY MORNING SHIFT

•	UNIT 66	TWO DEPUTIES	WESTSIDE
•	UNIT 65	TWO DEPUTIES	EASTSIDE

DAY SHIFT

•	UNIT 65*	TWO DEPUTIES	EASTSIDE
•	UNIT 66	ONE DEPUTY	WESTSIDE
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•	UNIT 60H1	ONE DEPUTY	PYRAMID LAKE
•	UNIT 60H2	ONE DEPUTY	PYRAMID LAKE
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•	COMMUNITY RELATIONS	ONE DEPUTY	
•	RESERVE COORDINATOR	ONE DEPUTY	
•	Y.A.L. COORDINATOR	ONE DEPUTY	VAL VERDE

PM SHIFT

•	UNIT 65*	TWO DEPUTIES	EASTSIDE
•	UNIT 65A	ONE DEPUTY	EASTSIDE
•	UNIT 66	TWO DEPUTIES	WESTSIDE
•	UNIT 66B	TWO DEPUTIES	WESTSIDE
•	UNIT 68K9	ONE DEPUTY	WESTSIDE & EASTSIDE

*TRAINING CAR

COUNTY COPS TEAM

- SERGEANT
- TEN DEPUTIES

** BETWEEN MEMORIAL DAY AND LABOR DAY, FOUR COPS DEPUTIES ARE REASSIGNED TO PYRAMID LAKE**

Los Angeles County
Department of Regional Planning

Planning for the Challenges Ahead

James E. Hartl, AICP
Director of Planning

January 27, 2004

Valencia Water Company
24631 Avenue Rockefeller
Valencia, CA 91385-5904
Attn: Environmental Review

SUBJECT: Water Supply Written Verification and Assessment
Project No. 00-196 The River Village Project
Tract Map No. 53108

The staff of the Department of Regional Planning is preparing an environmental review of the project identified above. To ensure that the County of Los Angeles is in compliance with SB 221 and SB 610, which became effective on January 1, 2002, we ask your assistance in providing the required water supply assessment for the project.

The project site is the first phase of the Riverwood Village Planning Area development of the Newhall Ranch Specific Plan in western unincorporated Los Angeles County, north of the Santa Clara River and west of Interstate 5 ("I-5"). The project is an application to subdivide the subject property into 418 lots to include a maximum of 1,444 residential units, a maximum of 1,353,000 square feet of non-residential mixed-used space, an elementary school, a community park, three private recreational facilities, open space and river trail uses. Two borrow sites (one located south of the Santa Clara River and the other north of SR-126 of unspecified acreage) and possible haul routes will be located outside of the tract map boundary but within the SP area. The domestic water system will be connected to existing facilities within the Valencia Commerce Center to the northeast.

SB221 and SB610 mandate that a water agency responds to the requested information within 90 days upon receiving the request. If you have any questions or foresee delay in completing your water supply assessment, please contact Dr. Hsiao-ching Chen of the Impact Analysis Section at (213) 974-6461, Monday through Thursday between 7:30 a.m. and 6 p.m. Our offices are closed on Fridays.

Very truly yours,

DEPARTMENT OF REGIONAL PLANNING
James E. Hartl, AICP
Director of Planning

Daryl Koutnik, Supervising Regional Planner
Impact Analysis Section

JEH:DLK:hcc

320 West Temple Street • Los Angeles, CA 90012 • 213-974-6411 • Fax: 213-626-0434 • TDD: 213-617-2292

Los Angeles County
Department of Regional Planning

Planning for the Challenges Ahead

James E. Hartl, AICP
Director of Planning

January 6, 2005

Valencia Water Company
24631 Avenue Rockefeller
Valencia, CA 91385-5904
Attn: Environmental Review

SUBJECT: Water Supply Written Verification and Assessment
Project No. 00-196 - The River Village Project
Tract Map No. 53108

The staff of the Department of Regional Planning continues preparing an environmental impact report for the project identified above. In compliance with SB 221 and SB 610, we previously asked your assistance in providing the required water supply assessment and verification for the project in a letter dated January 27, 2004 (see attachment).

Quite some time has expired since that letter. We would appreciate receiving your assessment and verification as soon as possible. SB221 and SB610 mandate that a water agency respond to the requested information within 90 days upon receiving the request.

If you have any questions or foresee delay in completing your water supply assessment, please contact Hsiao-ching Chen of the Impact Analysis Section at (213) 974-6461, Monday through Thursday between 7:30 a.m. and 6 p.m. Our offices are closed on Fridays.

Very truly yours,

DEPARTMENT OF REGIONAL PLANNING
James E. Hartl, AICP
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320 West Temple Street • Los Angeles, CA 90012 • 213-974-6411 • Fax: 213-626-0434 • TDD: 213-617-2292

ALJ/BDP/sid

Mailed 11/30/2001

Decision 01-11-048 November 29, 2001

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Application of Valencia Water Company (U34-W) seeking approval of its updated Water Management Program as ordered in Commission Resolution W-4154 dated August 5, 1999.	Application 99-12-025 (Filed December 17, 1999)

Nossaman, Guthner, Knox & Elliott, LLP, by Martin A. Mattes, Attorney at Law, and Robert J. Di Primio, for Valencia Water Company, applicant.
Brecher & Volker, LLP, by Stephan C. Volker. Attorney at Law, for Friends of the Santa Clara River, Santa Clarita Organization for Planning the Environment and Sierra Club, complainants.
James L. McBride, County Counsel, by Dennis L. Slivinski, Assistant County Counsel and Antonette B. Cordero, Assistant County Counsel for the County of Ventura.
Edwin and Joan Dunn, Robert P. Lathrop, for themselves.
Peter G. Fairchild, Attorney at Law, and Fred Curry, for the Water Division.

OPINION APPROVING WATER MANAGEMENT PROGRAM AND AUTHORIZING SERVICE AREA EXPANSION

water resources available to serve the projects described in Advice Letters 88 and 90.

2. Valencia is authorized to extend its service area to provide public utility water service to the North Valencia 2, Mountain View, West Creek and Tesoro del Valle developments as described in Advice Letters 88 and 90.

3. Advice Letters 88 and 90 are accepted for filing and shall become effective as of the date of this decision.

4. If Valencia proposes to expand its service area to serve the Newhall Ranch Specific Plan, or any part of it, Valencia shall file an application requesting authority to expand its service area, and provide an updated Water Management Program and advice letter covering any such service area expansion.

5. This proceeding is closed.

This order is effective today.

Dated November 29, 2001, at San Francisco, California.

LORETTA M. LYNCH
President
HENRY M. DUQUE
RICHARD A. BILAS
CARL W. WOOD
GEOFFREY F. BROWN
Commissioners

ITEM NO. 6.1

Castaic Lake Water Agency
Memorandum

January 4, 2007

To: CLWA Board of Directors

From: William J. Manetta
Acting Engineering and Operations Manager

Subject: Engineering and Operations Department Report

TREATMENT PLANT AND MAINTENANCE OPERATIONS

Completed Work:

Deliveries to the purveyors in December totaled 2,508 acre-feet (AF), for an average daily flow rate of 26 million gallons per day (MGD). December 2006 deliveries were 10% above December 2005 deliveries. Calendar year to date (CYTD) deliveries are 40,646 AF, which is 7% above 2005 CYTD deliveries. The fiscal-year-to-date (FYTD) deliveries for FY 2006/07 are 24,645 AF, which is 1% above FYTD 2005/06. Monthly flows for 2004, 2005 and 2006 are presented in the attached table. *(FY 2006/07 Goal 2.3.6: Meet all purveyor water demands and Goal 2.3.7: Meet all applicable water quality regulations.)*

Rio Vista Water Treatment Plant (RVWTP) maintenance activities included disassembling and cleaning ozone generator #1 and rebuilding the compressor for the ozone nitrogen system. Fabrication of media screens for clarifiers #1-4 has been completed.

Earl Schmidt Filtration Plant (ESFP) maintenance activities included cleaning and inspection of clarifier underdrains and recovering clarifier media from the wash water basins and placing the material back into the clarifiers.

Distribution System maintenance activities included valve vault inspections and cleaning and continued painting and re-labeling of pipeline bollards and station markers.

Work in Progress:

Recruitment for one treatment plant operator. *(Goal 4.1: Workforce Excellence – CLWA will hire and maintain excellent employees and compensate employees fairly)*

Restoration of clarifiers at RVWTP; restoration of media level to original specifications, and working with design engineers to minimize media loss and increase clarifier performance.

Optimization of Packaged Wash Water Return Recovery Units to comply with Department of Health Services (DHS) Crypto Action Plan.

Performance testing and monitoring of ozone system at ESFP for 120 days started on September 18th.

On November 15th pumps at Earl Schmidt Intake Pump Station were started to supply ESFP with water. Water could no longer be delivered to ESFP by gravity due to the lowered water level at Castaic Lake.

Planned Actions:

Install replacement polymer chemical feed pumps with automated flow pacing chemical feed pumps for Packaged Wash Water Recovery Units at ESFP.

Install new chlorine feed pumps replacing chlorine feed valves for improved efficiency and precise chlorine dosage at ESFP. Control system programming is complete, testing is currently underway.

PERCHLORATE CONTAMINATION PROGRAM MANAGEMENT

(FY 2006/07 Goal 2.1.5: Treat 2,400 gallons per minute of water from the Saugus Formation that is contaminated with perchlorate and restore to potable water service and Goal 2.1.6: Develop replacement wells for capacity lost due to perchlorate contamination.)

Completed Work:

The Agency and purveyors are proceeding to restore the production capacity of the groundwater supply wells contaminated by perchlorate while working on the objectives of containing the downgradient migration of perchlorate and recovering costs incurred in responding to the perchlorate contamination.

Work in Progress/Planned Actions:

Work continues on multiple tasks to address the perchlorate contamination of portions of the local aquifers stemming from past manufacturing activities on the Whittaker-Bermite site. The Agency and purveyors are proceeding to restore the production capacity of the groundwater supply wells contaminated by perchlorate, while working on the objectives of containing the downgradient migration of perchlorate and recovering costs incurred in responding to the perchlorate contamination.

The Agency has authorized Black & Veatch (B&V), Carollo Engineers (CE) and Kennedy/Jenks Consultants (K/J) to assist in providing services to respond to the various tasks associated with the Perchlorate Remediation Program. The following table provides a status report on the activities and tasks:

Task Group	Tasks	Consultant	Status
Settlement Activities	Project Description	K/J	Complete.
	Final Settlement	K/J, Nossaman	Negotiations ongoing.
DTSC Approval Activities	Remedial Investigation (RI)	K/J	DTSC approved 8/16/05.
	Feasibility Study (FS)	K/J	DTSC approved 8/16/05.
	Draft Remedial Action Plan (RAP)	K/J	DTSC approved 8/16/05.
	Final RAP	K/J	Public Hearing held 9/7/05. DTSC approved 1/20/06.
U.S. Army Corps of Engineers Feasibility Phase Study	Conceptual Hydrogeology Technical Memorandum	CH2MHILL	Final distributed 1/19/05. Progress report with model construction calibration distributed 10/11/05.
U.S. Army Corps of Engineers Feasibility Phase Study	Monitoring	CH2MHILL	Federal FY 2005 funding provides for limited monitoring of existing test wells and testing of NCWD NC13 Southern Saugus well. Completed 6/14/06.

Task Group	Tasks	Consultant	Status
DHS Approval Activities (97-005)	Source Water Assessment	B&V, CE	Incorporated in Engineer's Report.
	Water Quality Investigation	B&V, CE	Incorporated in Engineer's Report.
	Source Protection Plan	B&V	Incorporated in Engineer's Report.
	Effective Monitoring and Treatment	B&V, CE, CH2MHILL	Incorporated in Engineer's Report.
	Human Health Risk	B&V	Incorporated in Engineer's Report.
	Alternatives Evaluation	B&V, CE	Incorporated in Engineer's Report.
	Engineers Report	B&V	Final Draft submitted to DHS 10/27/06. Comments received on 12/1/06. Responded to DHS comments 12/19/06.
	CEQA	B&V	Mitigated Negative Declaration certified 9/14/05.
	Permit Application	B&V	Pending design completion.
	Public Hearing	B&V	Pending design completion.
	DHS Evaluation & Permit	B&V	Pending design completion.
Implementation Activities	Easements and Right of Way	K/J	Alignment studies complete 8/08/05. Document preparation in progress.
	Treatment Design	K/J	Scheduled design completion 1/07.
	Pipeline Design	K/J	Scheduled design completion 1/07.
	Construction	K/J	Plan to start 5/07.
	Startup and Monitoring	K/J	Scheduled 1/08.

The City of Santa Clarita's Multi-Jurisdictional Task Force and Citizens Advisory Group meetings will be held on February 28, 2007. The next bi-monthly DTSC meeting will be held on January 23, 2007.

CAPITAL IMPROVEMENT PROJECTS

Sand Canyon Pipeline and Reservoir

(FY 2006/07 Goal 2.2: Construction – CLWA will building facilities which reflect the best available technology and materials, in a cost effective and timely manner and Goal 2.2.3: Complete the Sand Canyon Reservoir.)

Completed Work:

At the reservoir, base slab, drain overflow pipeline, inlet/outlet pipeline, and reservoir walls are complete.

ITEM NO. 9

Castaic Lake Water Agency
Memorandum

November 22, 2005

To: CLWA Planning and Engineering Committee

From: Ken Petersen
Engineering and Operations Manager

Subject: Perchlorate Remediation Program

SUMMARY

Work continues on multiple tasks to address the perchlorate contamination of portions of the local aquifers, stemming from past manufacturing activities on the Whittaker-Bermite site. The Agency and purveyors are proceeding to restore the production capacity of the groundwater supply wells contaminated by perchlorate, while working on the objectives of containing the downgradient migration of perchlorate and recovering costs incurred in responding to the perchlorate contamination.

DISCUSSION

The Agency has authorized Black & Veatch (B&V), Carollo Engineers (CE) and Kennedy/Jenks Consultants (K/J) to assist in providing services to respond to the various tasks associated with the Perchlorate Remediation Program. The following table provides a status report on the activities and tasks:

Task Group	Tasks	Consultant	Status
Settlement Activities	Project Description	K/J	Complete.
	Final Settlement	K/J, Nossaman	Negotiations ongoing.
DTSC Approval Activities	Remedial Investigation (RI)	K/J	DTSC Approved 8/16/2005.
	Feasibility Study (FS)	K/J	DTSC Approved 8/16/2005.
	Draft Remedial Action Plan (RAP)	K/J	DTSC Approved 8/16/2005.
	Final RAP	K/J	Public Hearing held 9/7/05. DTSC responding to comments.
U.S. Army Corps of Engineers Feasibility Phase Study	Conceptual Hydrogeology Technical Memorandum	CH2MHILL	Final distributed 1/19/2005. Progress report with model construction calibration distributed 10/11/2005.

Task Group	Tasks	Consultant	Status
U.S. Army Corps of Engineers Feasibility Phase Study	Monitoring	CH2MHILL	FY 2005 funding provides for limited monitoring of existing test wells.
DHS Approval Activities (97-005)	Source Water Assessment	B&V, CE	Received comments from DHS 5/17/2005.
	Water Quality Investigation	B&V, CE	Received comments from DHS 5/17/2005.
	Source Protection Plan	B&V	Received comments from DHS 5/17/2005.
	Effective Monitoring and Treatment	B&V, CE, CH2MHILL	Received comments from DHS 8/15/2005.
	Human Health Risk	B&V	Draft completed. Awaiting comments from DHS.
	Alternatives Evaluation	B&V, CE	Draft completed. Awaiting comments from DHS.
	CEQA	B&V	Mitigated Negative Declaration certified 9/14/2005.
	Permit Application	B&V	Pending design completion.
	Public Hearing	B&V	Pending design completion.
	DHS Evaluation & Permit	B&V	Pending design completion.
Implementation Activities	Easements and Right of Way	K/J	Alignment studies complete.
	Treatment Design	K/J	Scheduled design completion 2/06.
	Pipeline Design	K/J	Alignment studies complete.
	Construction	K/J	Plan to start 2/06.
	Startup and Monitoring	K/J	Scheduled 10/06.

2

The City of Santa Clarita held its regular Multi-Jurisdictional Task Force and Citizens Advisory Group meetings on October 19, 2005. The City of Santa Clarita will hold its next regular Multi-Jurisdictional Task Force meeting examining the issues surrounding the Whittaker-Bermite site on December 7, 2005 and the Citizens' Advisory Group (CAG) meeting will immediately follow this meeting. The bi-monthly DTSC meeting was held on October 18, 2005. The next bi-monthly DTSC meeting will be held on December 5, 2005.

FINANCIAL STATUS

Settlement negotiations are ongoing with the purveyors, Whittaker-Bermite and insurance carriers.

KP

3

QUARTERLY GROUNDWATER MONITORING REPORT, OPERABLE UNIT 7
Third Quarter 2005
(Calendar Quarter July 1 to September 30, 2005)

Former Whittaker-Bermite Facility
Santa Clarita, California

Submitted to:

California Environmental Protection Agency
Department of Toxic Substances Control
Glendale, California

On behalf of:

Whittaker Corporation
Simi Valley, California

Prepared by:

ENVIRON International Corporation
Emeryville, California

April 3, 2006
Project No. 03-11368L

RECEIVED
MAY 22 2006
NCWD

QUARTERLY GROUNDWATER MONITORING REPORT, OPERABLE UNIT 7
Third Quarter 2005
(Calendar Quarter July 1 to September 30, 2005)

Former Whittaker-Bermite Facility
Santa Clarita, California

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Glendale, California

On behalf of:

Whittaker Corporation
Simi Valley, California

Prepared by:

ENVIRON International Corporation
Emeryville, California

April 3, 2006
Project No. 03-11368L

TABLE 7. SUMMARY OF QUARTERLY GROUNDWATER ANALYTICAL RESULTS - PERCHLORATE, CHLORATE, AND FREQUENTLY DETECTED VOCs
Former Whittaker Corporation Bermite Facility; Santa Clarita, California

Well No.	Aquifer (Prelim.)	Sample Date	Perchlorate (µg/l)	Chlorate (µg/l)	EPA Method (VOCs)	PCE (µg/l)	TCE (µg/l)	cis-1,2-DCE (µg/l)	1,1-DCE (µg/l)	1,1,1-TCA (µg/l)
11-MW-1	Alluvium	1/25/05	206	na	524.2	<0.50	3.4	<0.50	<0.50	<0.50
11-MW-1	Alluvium	4/13/05	399	12	524.2	<0.50	8.2	<0.50	<0.50	<0.50
11-MW-1	Alluvium	7/25/05	255	<3.9	524.2	<0.50	1.8	<0.50	<0.50	<0.50
11-MW-2	Alluvium	4/26/04	170	na	8260B	1.0 UJ	2.0 J	1.0 UJ	1.0 UJ	1.0 UJ
11-MW-2	Alluvium	7/15/04	188	na	524.2	<0.50	2.9	<0.50	<0.50	<0.50
11-MW-2	Alluvium	9/15/04	256	na	524.2	<0.50	4.1	<0.50	<0.50	<0.50
11-MW-2	Alluvium	1/17/05	251	na	524.2	<0.50	5.8	<0.50	<0.50	<0.50
11-MW-2	Alluvium	4/13/05	194	27	524.2	<0.50	4.9	<0.50	<0.50	<0.50
11-MW-2	Alluvium	7/25/05	233	<3.9	524.2	<0.50	1.1	<0.50	<0.50	<0.50
11-MW-3	Saugus	4/27/04	<4.0	na	8260B	<1.0	<1.0	<1.0	<1.0	<1.0
11-MW-3	Saugus	7/14/04	<4.0	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
11-MW-3	Saugus	9/15/04	<4.0	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
11-MW-3	Saugus	1/18/05	27.4	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
11-MW-3	Saugus	4/13/05	33.4	<3.9	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
11-MW-3-FD		4/13/05	38.7	<3.9	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
11-MW-3	Saugus	7/27/05	7.3	<3.9	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
11-MW-4	Saugus	4/26/04	918	na	8260B	<1.0	12	<1.0	<1.0	<1.0
11-MW-4	Saugus	7/14/04	472	na	524.2	<0.50	14	<0.50	<0.50	<0.50
11-MW-4	Saugus	9/15/04	438	na	8260B	<1.0	13	<1.0	<1.0	<1.0
11-MW-4-FD		9/15/04	436	na	8260B	<1.0	14	<1.0	<1.0	<1.0
11-MW-4	Saugus	1/17/05	419	na	524.2	<0.50	16	<0.50	<0.50	<0.50
11-MW-4	Saugus	4/13/05	549	<3.9	524.2	<0.50	25	<0.50	<0.50	<0.50
11-MW-4	Saugus	7/26/05	524	<3.9	524.2	<0.50	13	<0.50	<0.50	<0.50
11-MW-4-FD		7/26/05	540	<3.9	524.2	<0.50	17	<0.50	<0.50	<0.50
11-MW-5	Saugus	4/22/04	9.8	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
11-MW-5	Saugus	7/15/04	8.5	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
11-MW-5	Saugus	9/16/04	11.6	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
11-MW-5	Saugus	1/18/05	14.3	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
11-MW-5-FD		1/18/05	14.0	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
11-MW-5	Saugus	4/14/05	11.7	<3.9	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
11-MW-5	Saugus	7/26/05	12.2	<3.9	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
11-MW-6	Saugus	4/26/04	15.8	na	8260B	<1.0	<1.0	<1.0	<1.0	<1.0
11-MW-6	Saugus	7/14/04	13.4	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
11-MW-6	Saugus	9/16/04	15.7	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
11-MW-6	Saugus	1/18/05	13.9	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
11-MW-6	Saugus	4/14/05	15.6	<3.9	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
11-MW-6	Saugus	7/26/05	16.5	<3.9	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
11-MW-7	Saugus	4/26/04	81.6	<10	8260B	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
11-MW-7	Saugus	7/15/04	75.6	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
11-MW-7	Saugus	9/16/04	87.8	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
11-MW-7	Saugus	1/18/05	72	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
11-MW-7	Saugus	4/14/05	68.2	<78	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
11-MW-7	Saugus	7/26/05	62.3	<3.9	524.2	<0.50	<0.50	<0.50	<0.50	<0.50

TABLE 7. SUMMARY OF QUARTERLY GROUNDWATER ANALYTICAL RESULTS - PERCHLORATE, CHLORATE, AND FREQUENTLY DETECTED VOCs
Former Whittaker Corporation Bermite Facility; Santa Clarita, California

Well No.	Aquifer (Prelim.)	Sample Date	Perchlorate (µg/l)	Chlorate (µg/l)	EPA Method (VOCs)	PCE (µg/l)	TCE (µg/l)	cis-1,2-DCE (µg/l)	1,1-DCE (µg/l)	1,1,1-TCA (µg/l)
14-MW-1	Saugus S-III	4/20/05	8,490	12	8260B	<8.2	500	<8.2	8.8	<8.2
14-MW-1-FD		4/20/05	8,680	11	8260B	<10	510	<10	12	<10
14-MW-1	Saugus S-III	7/28/05	7,730	na	8260B	<5.0	410	<5.0	<5.0	<5.0
14-MW-2	Saugus S-III	4/20/05	62,200	15	8260B	<200	8,700	<200	<200	<200
14-MW-2	Saugus S-III	7/26/05	<4.0	na	8260B	<78	8,200	<78	<78	<78
14-MW-2-FD		7/26/05	53,700	na	8260B	<100	8,200	<100	<100	<100
20-MW-2	Saugus	7/15/04	101	na	8260B	<1.0	<1.0	<1.0	<1.0	<1.0
20-MW-2	Saugus	9/17/04	123	<10	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
20-MW-2	Saugus	1/20/05	113	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
20-MW-2	Saugus	4/19/05	128	<39	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
20-MW-2	Saugus	7/29/05	120	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
20-MW-3	Saugus	7/16/04	187	na	8260B	<1.0	<1.0	<1.0	<1.0	<1.0
20-MW-3	Saugus	9/17/04	270	<10	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
20-MW-3	Saugus	1/20/05	265	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
20-MW-3	Saugus	4/20/05	273	<3.9	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
20-MW-3	Saugus	7/29/05	276	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
21-MW-1	Saugus	7/16/04	56.6	na	8260B	<1.0	<1.0	<1.0	<1.0	<1.0
21-MW-1	Saugus	9/16/04	73.2	<10	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
21-MW-1	Saugus	1/19/05	67	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
21-MW-1	Saugus	4/20/05	67.6	<3.9	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
21-MW-1	Saugus	7/29/05	56.0	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
33-MW-1A	Saugus S-III	4/26/04	432	na	524.2	<0.50	1.6	<0.50	<0.50	<0.50
33-MW-1A-FD		4/26/04	447	na	524.2	<0.50	1.5	<0.50	<0.50	<0.50
33-MW-1A	Saugus S-III	7/14/04	420	na	524.2	<0.50	1.8	<0.50	<0.50	<0.50
33-MW-1A	Saugus S-III	9/17/04	410	na	524.2	<0.50	2.4	<0.50	<0.50	<0.50
33-MW-1A	Saugus S-III	1/13/05	123	59	524.2	<0.50	7.2	<0.50	<0.50	<0.50
33-MW-1A	Saugus S-III	4/7/05	273	20	524.2	<0.50	7.3	<0.50	<0.50	<0.50
33-MW-1A	Saugus S-III	7/27/05	387	na	524.2	<0.50	6.9	<0.50	<0.50	<0.50
33-MW-1B	Saugus S-III	1/12/05	811	150 J	524.2	<1.7	220	<1.7	<1.7	<1.7
33-MW-1B	Saugus S-III	4/8/05	651	130 J	524.2	<2	230	<2	<2	<2
33-MW-1B	Saugus S-III	7/22/05	242	na	524.2	<1.2	130	<1.2	<1.2	<1.2
33-MW-1C	Saugus S-III	1/12/05	281	220	524.2	<0.50	0.58	<0.50	<0.50	<0.50
33-MW-1C	Saugus S-III	4/8/05	283	220 J	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
33-MW-1C	Saugus S-III	7/21/05	69.5	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
50-MW-1	Saugus	7/14/04	338	na	8260B	<1.0	<1.0	<1.0	<1.0	<1.0
50-MW-1	Saugus	9/15/04	296	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
50-MW-1	Saugus	1/19/05	267	50	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
50-MW-1-FD		1/19/05	270	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
50-MW-1	Saugus	4/19/05	456	68	524.2	<0.50	1.2	<0.50	<0.50	<0.50
50-MW-1	Saugus	7/27/05	262	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50

TABLE 7. SUMMARY OF QUARTERLY GROUNDWATER ANALYTICAL RESULTS - PERCHLORATE, CHLORATE, AND FREQUENTLY DETECTED VOCs
Former Whittaker Corporation Bermite Facility; Santa Clarita, California

Well No.	Aquifer (Prelim.)	Sample Date	Perchlorate (µg/l)	Chlorate (µg/l)	EPA Method (VOCs)	PCE (µg/l)	TCE (µg/l)	cis-1,2-DCE (µg/l)	1,1-DCE (µg/l)	1,1,1-TCA (µg/l)
51-MW-1	Saugus	4/23/04	<4.0	<10	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
51-MW-1	Saugus	7/14/04	<4.0	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
51-MW-1	Saugus	9/15/04	<4.0	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
51-MW-1	Saugus	1/19/05	<4.0	<3.9	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
51-MW-1	Saugus	4/15/05	<4.0	<3.9	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
51-MW-1	Saugus	7/29/05	<4.0	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
51-MW-1 -FD		7/29/05	<4.0	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
51-MW-2	Saugus	7/14/04	<4.0	na	8260B	<1.0	<1.0	<1.0	<1.0	<1.0
51-MW-2	Saugus	9/17/04	<4.0	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
51-MW-2	Saugus	1/12/05	<4.0	3.9 UJ	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
51-MW-2	Saugus	4/13/05	<4.0	<3.9	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
51-MW-2	Saugus	7/26/05	<4.0	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
61-MW-1	Saugus	4/22/04	295	<10	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
61-MW-1	Saugus	7/13/04	318	na	524.2	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ
61-MW-1-FD		7/13/04	313	na	524.2	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ
61-MW-1	Saugus	9/21/04	320	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
61-MW-1	Saugus	1/19/05	271	<3.9	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
61-MW-1	Saugus	4/15/05	278	<3.9	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
61-MW-1	Saugus	7/20/05	291 J	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
67-MW-1	Alluvium	1/18/05	80.1	130	524.2	<0.50	4.2	0.92	<0.50	<0.50
67-MW-1	Alluvium	4/11/05	70.1	44	524.2	<0.50	1.5	<0.50	<0.50	<0.50
67-MW-1	Alluvium	7/20/05	56.6	31	524.2	<0.50	1.2	<0.50	<0.50	<0.50
67-MW-2	Saugus	4/23/04	950	1,600	8260B	<1.0	50	47	<1.0	<1.0
67-MW-2	Saugus	7/14/04	1,180	1,700	524.2	<0.50	45	51	<0.50	<0.50
67-MW-2-FD		7/14/04	1,180	1,700	524.2	<0.50	49	56	<0.50	<0.50
67-MW-2	Saugus	9/15/04	1,200	na	8260B	<1.0	41	44	<1.0	<1.0
67-MW-2	Saugus	1/18/05	1,060	1,800	524.2	<0.50	53	57	<0.50	<0.50
67-MW-2	Saugus	4/15/05	1,000	1,500	524.2	<0.50	53	56	<0.50	<0.50
67-MW-2	Saugus	7/22/05	1,110	1,900	524.2	<0.50	57	58	<0.50	<0.50
67-MW-3A	Fill	7/22/05	53.5	<3.9	8260B	<1.0	<1.0	<1.0	<1.0	<1.0
67-MW-3B	Saugus	7/22/05	88.2	140	8260B	<1.0	8.8	17	<1.0	<1.0
67-MW-3	Saugus	4/23/04	<4.0	<10	8260B	<1.0	<1.0	24	<1.0	<1.0
67-MW-3	Saugus	7/14/04	<4.0	<10	524.2	<0.50	<0.50	35	<0.50	<0.50
67-MW-3	Saugus	9/15/04	<4.0	na	8260B	<1.0	<1.0	28	<1.0	<1.0
67-MW-3	Saugus	1/18/05	<4.0	<3.9	524.2	<0.50	<0.50	28	<0.50	<0.50
67-MW-3	Saugus	4/15/05	9.2	<3.9	524.2	<0.50	<0.50	32	<0.50	<0.50
67-MW-3-FD		4/15/05	<4.0	<3.9	524.2	<0.50	<0.50	32	<0.50	<0.50
67-MW-3	Saugus	7/22/05	<4.0	23	524.2	<0.50	<0.50	28	<0.50	<0.50
67-MW-4	Saugus	4/23/04	574	900	524.2	<0.50	3.3	<0.50	<0.50	<0.50
67-MW-4	Saugus	7/13/04	258	180	524.2	<0.50	2.1	<0.50	<0.50	<0.50
67-MW-4	Saugus	9/15/04	899	na	524.2	<0.50	8.6	<0.50	<0.50	<0.50
67-MW-4	Saugus	1/17/05	163	190	524.2	<0.50	0.81	<0.50	<0.50	<0.50
67-MW-4	Saugus	4/13/05	89.5	83	524.2	0.55	0.79	<0.50	<0.50	<0.50
67-MW-4	Saugus	7/21/05	65.8	71	524.2	0.60	0.59	<0.50	<0.50	<0.50
67-MW-4-FD		7/21/05	64.1	72	524.2	0.63	0.64	<0.50	<0.50	<0.50

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TABLE 7. SUMMARY OF QUARTERLY GROUNDWATER ANALYTICAL RESULTS - PERCHLORATE, CHLORATE, AND FREQUENTLY DETECTED VOCs
Former Whittaker Corporation Bermite Facility; Santa Clarita, California

Well No.	Aquifer (Prelim.)	Sample Date	Perchlorate (µg/l)	Chlorate (µg/l)	EPA Method (VOCs)	PCE (µg/l)	TCE (µg/l)	cis-1,2-DCE (µg/l)	1,1-DCE (µg/l)	1,1,1-TCA (µg/l)
67-MW-5	Saugus	4/23/04	3,880	2,400	8260B	<1.0	<1.0	<1.0	<1.0	<1.0
67-MW-5	Saugus	7/13/04	4,220	2,400	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
67-MW-5	Saugus	9/15/04	4,190	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
67-MW-5	Saugus	1/18/05	3,340	2,300	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
67-MW-5-FD		1/18/05	3,480	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
67-MW-5	Saugus	4/14/05	2,860	1,500	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
67-MW-5	Saugus	7/27/05	4,180	2,900	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
67-MW-6	Saugus	7/13/04	2,990	4,200	8260B	<1.0	1.3	<1.0	<1.0	<1.0
67-MW-6	Saugus	9/15/04	2,940	3,900	8260B	<1.0	1.7	<1.0	<1.0	<1.0
67-MW-6	Saugus	1/18/05	2,580	4,200	524.2	0.84	<0.50	<0.50	<0.50	<0.50
67-MW-6	Saugus	4/14/05	2,670	4,100	524.2	<0.50	0.94	<0.50	<0.50	<0.50
67-MW-6	Saugus	7/22/05	1,550	4,400	524.2	<0.50	1.2	<0.50	<0.50	<0.50
67-PZ-7A	Alluvium	7/26/05	7.9	<3.9	8260B	<1.0	<1.0	<1.0	<1.0	<1.0
67-MW-7	Saugus	7/27/05	105	37	8260B	<1.0	<1.0	<1.0	<1.0	<1.0
67-MW-8	Saugus	7/25/05	<4.0	<3.9	8260B	<1.0	<1.0	2.6	<1.0	<1.0
67-MW-9	Saugus	7/22/05	<4.0	<3.9	8260B	<1.0	<1.0	<1.0	<1.0	<1.0
69-MW-1	Saugus	4/22/04	<4.0	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
69-MW-1	Saugus	7/14/04	<4.0	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
69-MW-1	Saugus	9/21/04	<4.0	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
69-MW-1	Saugus	1/19/05	<4.0	<3.9	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
69-MW-1	Saugus	4/15/05	<4.0	<3.9	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
69-MW-1	Saugus	7/20/05	4 UJ	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
75-PW-1	Alluvium	4/21/04	<4.0	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
75-PW-1	Alluvium	7/12/04	<4.0	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
75-PW-1	Alluvium	9/13/04	<4.0	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
75-PW-1	Alluvium	1/14/05	<4.0	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
75-PW-1	Alluvium	4/11/05	<4.0	57	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
75-PW-1	Alluvium	7/18/05	<4.0	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
75-MW-1	Alluvium	1/12/05	38.3	49 J	524.2	2.3	0.58	<0.50	<0.50	<0.50
75-MW-1-FD		1/12/05	10.3	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
75-MW-1	Alluvium	4/12/05	8.1	54	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
75-MW-1	Alluvium	7/19/05	11.9	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
75-MW-2	Alluvium	1/19/05	53.6	44	524.2	1.1	<0.50	<0.50	<0.50	<0.50
75-MW-2	Alluvium	4/11/05	23.4	49	524.2	0.73	<0.50	<0.50	<0.50	<0.50
75-MW-2	Alluvium	7/19/05	60.8	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
75-MW-3	Alluvium	1/19/05	78.2	75	524.2	1.1	<0.50	<0.50	<0.50	<0.50
75-MW-3	Alluvium	4/11/05	82.6	70	524.2	0.99	<0.50	<0.50	<0.50	<0.50
75-MW-3	Alluvium	7/19/05	73.6	na	524.2	0.88	<0.50	<0.50	<0.50	<0.50
75-MW-4	Saugus	4/20/04	173	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
75-MW-4	Saugus	7/7/04	165	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
75-MW-4	Saugus	9/14/04	200	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
75-MW-4	Saugus	1/14/05	164	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
75-MW-4	Saugus	4/13/05	152	<78	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
75-MW-4	Saugus	7/21/05	137	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50

TABLE 7. SUMMARY OF QUARTERLY GROUNDWATER ANALYTICAL RESULTS - PERCHLORATE, CHLORATE, AND FREQUENTLY DETECTED VOCs
Former Whittaker Corporation Bermite Facility; Santa Clarita, California

Well No.	Aquifer (Prelim.)	Sample Date	Perchlorate (µg/l)	Chlorate (µg/l)	EPA Method (VOCs)	PCE (µg/l)	TCE (µg/l)	cis-1,2-DCE (µg/l)	1,1-DCE (µg/l)	1,1,1-TCA (µg/l)
75-MW-5	Alluvium	4/19/04	109	na	524.2	0.78	<0.50	<0.50	<0.50	<0.50
75-MW-5	Alluvium	7/6/04	150	na	524.2	1.3	<0.50	<0.50	<0.50	<0.50
75-MW-5	Alluvium	9/14/04	182	na	524.2	0.91	<0.50	<0.50	<0.50	<0.50
75-MW-5	Alluvium	1/14/05	148	na	524.2	0.83	<0.50	<0.50	<0.50	<0.50
75-MW-5	Alluvium	4/12/05	115	64	524.2	1.4	0.54	<0.50	<0.50	<0.50
75-MW-5	Alluvium	7/20/05	99.3	59	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
75-MW-6	Saugus	4/20/04	116	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
75-MW-6	Saugus	7/7/04	98.6	na	524.2	<0.50	0.56	<0.50	<0.50	<0.50
75-MW-6	Saugus	9/14/04	96.1	na	524.2	<0.50	0.58	<0.50	<0.50	<0.50
75-MW-6	Saugus	1/14/05	96.9	na	524.2	<0.50	0.53	<0.50	<0.50	<0.50
75-MW-6	Saugus	4/12/05	95.9	25	524.2	<0.50	0.83	<0.50	<0.50	<0.50
75-MW-6	Saugus	7/19/05	79.1	na	524.2	<0.50	0.51	<0.50	<0.50	<0.50
75-MW-7	Saugus	4/20/04	47.0	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
75-MW-7	Saugus	7/7/04	87.9	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
75-MW-7	Saugus	9/15/04	104	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
75-MW-7	Saugus	1/14/05	94	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
75-MW-7	Saugus	4/13/05	95.2	<3.9	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
75-MW-7	Saugus	7/20/05	94.8	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
75-MW-8	Saugus	4/20/04	10.7	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
75-MW-8-FD		4/20/04	10.8	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
75-MW-8	Saugus	7/8/04	17.4	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
75-MW-8-FD		7/8/04	17.0	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
75-MW-8	Saugus	9/13/04	15.4	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
75-MW-8-FD		9/13/04	15.6	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
75-MW-8	Saugus	1/12/05	13.1	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
75-MW-8	Saugus	4/12/05	15.4	480	524.2	0.7	<0.50	<0.50	<0.50	<0.50
75-MW-8	Saugus	7/20/05	18.3	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
75-MW-9	Saugus	4/19/04	161	na	524.2	1.3 J	0.68 J	0.50UJ	0.50UJ	0.50UJ
75-MW-9	Saugus	7/6/04	109	na	524.2	1.6	0.68	<0.50	<0.50	<0.50
75-MW-9	Saugus	9/14/04	133	na	524.2	1.1	0.54	<0.50	<0.50	<0.50
75-MW-9	Saugus	1/14/05	98.8	na	524.2	0.88	<0.50	<0.50	<0.50	<0.50
75-MW-9	Saugus	4/12/05	109	27	524.2	1.2	0.56	<0.50	<0.50	<0.50
75-MW-9	Saugus	7/20/05	107	na	524.2	0.92	<0.50	<0.5	<0.50	<0.50
75-MW-10	Saugus	4/20/04	43.1	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
75-MW-10	Saugus	7/7/04	34.6	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
75-MW-10	Saugus	9/14/04	42.4	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
75-MW-10	Saugus	1/13/05	27.6	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
75-MW-10	Saugus	4/13/05	27.9	13	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
75-MW-10	Saugus	7/20/05	33.2	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
75-MW-11	Saugus	4/19/04	130	na	524.2	<0.50	1.0	<0.50	<0.50	<0.50
75-MW-11	Saugus	7/9/04	115	na	524.2	0.7	1.1	<0.50	<0.50	<0.50
75-MW-11	Saugus	9/14/04	144	na	524.2	1.1	1.8	0.53	<0.50	<0.50
75-MW-11	Saugus	1/13/05	112	na	524.2	2.1	2.5	0.95	<0.50	<0.50
75-MW-11	Saugus	4/11/05	110	54	524.2	1.6	1.1	<0.50	<0.50	<0.50
75-MW-11	Saugus	7/20/05	98.9	na	524.2	1.2	1.6	0.52	<0.50	<0.50

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TABLE 7. SUMMARY OF QUARTERLY GROUNDWATER ANALYTICAL RESULTS - PERCHLORATE, CHLORATE, AND FREQUENTLY DETECTED VOCs
Former Whittaker Corporation Bermite Facility; Santa Clarita, California

Well No.	Aquifer (Prelim.)	Sample Date	Perchlorate (µg/l)	Chlorate (µg/l)	EPA Method (VOCs)	PCE (µg/l)	TCE (µg/l)	cis-1,2-DCE (µg/l)	1,1-DCE (µg/l)	1,1,1-TCA (µg/l)
75-MW-12	Alluvium	1/17/05	14.5	260	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
75-MW-12	Alluvium	4/12/05	33.3	150	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
75-MW-12	Alluvium	7/21/05	32.2	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
75-MW-13	Saugus	4/19/04	52.3	na	524.2	1.1 J	1.5 J	0.50UJ	0.50UJ	0.50UJ
75-MW-13	Saugus	7/9/04	54.2	na	524.2	0.75	0.51	<0.50	<0.50	<0.50
75-MW-13	Saugus	9/14/04	68.9	na	524.2	0.77	<0.50	<0.50	<0.50	<0.50
75-MW-13	Saugus	1/12/05	66.5	na	524.2	1.6	0.7	<0.50	<0.50	<0.50
75-MW-13	Saugus	4/12/05	69.8	100	524.2	1.1	0.51	<0.50	<0.50	<0.50
75-MW-13	Saugus	7/21/05	64.0	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
75-MW-14	Alluvium	1/14/05	156	55 J	8260B	110	17	<2.0	28	29
75-MW-14	Alluvium	4/13/05	61.8	51	524.2	83	5.5	<0.50	12	7.2
75-MW-14	Alluvium	7/25/05	61.3	46	524.2	68	7.9	<0.50	10	6
75-MW-15	Saugus	4/21/04	98.4	24	8260B	37	74	<1.0	4.3	<1.0
75-MW-15	Saugus	7/7/04	100	39	524.2	58	77	0.59	4.2	<0.50
75-MW-15	Saugus	9/15/04	106	na	8260B	59	95	<1.0	4.8	<1.0
75-MW-15	Saugus	1/13/05	192	na	8260B	91	41	<2.0	4.7	2.8
75-MW-15	Saugus	4/13/05	131	50	524.2	160	15	<12	28	22
75-MW-15	Saugus	7/26/05	91.9	52	524.2	140	18	<1.0	26	16
75-MW-16	Saugus	4/20/04	<4.0	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
75-MW-16	Saugus	7/7/04	<4.0	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
75-MW-16	Saugus	9/15/04	<4.0	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
75-MW-16	Saugus	1/14/05	<4.0	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
75-MW-16	Saugus	4/13/05	<4.0	<3.9	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
75-MW-16	Saugus	7/26/05	<4.0	<3.9	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
75-MW-17	Alluvium	4/20/04	177	na	524.2	0.74	1.3	<0.50	<0.50	<0.50
75-MW-17	Alluvium	7/8/04	94.4	na	524.2	1.8	1.4	<0.50	<0.50	<0.50
75-MW-17	Alluvium	9/14/04	180	na	524.2	1.2 J	1.6 J	0.5 UJ	0.50 UJ	0.50 UJ
75-MW-17	Alluvium	1/14/05	29.2	na	524.2	1.1	0.54	<0.50	<0.50	<0.50
75-MW-17	Alluvium	4/12/05	49	53	524.2	0.87	0.8	<0.50	<0.50	<0.50
75-MW-17	Alluvium	7/19/05	188	33	524.2	1.0	2.6	<0.50	<0.50	<0.50
75-MW-18A	Alluvium	7/21/05	75.1	23	524.2	1.1	21	<0.50	<0.50	<0.50
75-MW-18	Alluvium	4/21/04	64.7	na	8260B	<50	2,000	<50	<50	<50
75-MW-18	Saugus	7/7/04	51.1	24	8260B	<50	1,900	<50	<50	<50
75-MW-18	Saugus	9/15/04	70.3	na	8260B	<25	1,400	<25	<25	<25
75-MW-18	Saugus	1/14/05	89.1	na	8260B	<50	2,100	<50	<50	<50
75-MW-18	Alluvium	4/13/05	111	48	8260B	<50	3,000	<50	<50	<50
75-MW-18-FD		4/13/05	110	45	8260B	<50	3,300	<50	<50	<50
75-MW-18	Alluvium	7/26/05	114	43	8260B	<50	2,500	<50	<50	<50
75-MW-19	Saugus	4/21/04	140	na	8260B	<200	14,000	<200	<200	<200
75-MW-19	Saugus	7/7/04	136	53	8260B	<500	16,000	<500	<500	<500
75-MW-19	Saugus	9/15/04	137	na	8260B	<200	13,000	<200	<200	<200
75-MW-19	Saugus	1/14/05	173	na	8260B	<250	13,000	<250	<250	<250
75-MW-19	Saugus	4/12/05	147	61	524.2	<200	13,000	<200	<200	<200
75-MW-19	Saugus	7/26/05	151	46	8260B	<170	12,000	<170	<170	<170
75-MW-19-FD		7/26/05	152	49	8260B	<120	12,000	<120	<120	<120

TABLE 7. SUMMARY OF QUARTERLY GROUNDWATER ANALYTICAL RESULTS - PERCHLORATE, CHLORATE, AND FREQUENTLY DETECTED VOCs

Former Whittaker Corporation Bermite Facility; Santa Clarita, California

Well No.	Aquifer (Prelim.)	Sample Date	Perchlorate (µg/l)	Chlorate (µg/l)	EPA Method (VOCs)	PCE (µg/l)	TCE (µg/l)	cis-1,2-DCE (µg/l)	1,1-DCE (µg/l)	1,1,1-TCA (µg/l)
75-MW-20	Saugus	7/26/05	99	88	8260B	<100	8,600	<100	<100	<100
CW-11A	Saugus-S III	5/5/04	39,200	na	524.2	12 UJ	1,900 J	12 UJ	12 UJ	12 UJ
CW-11A	Saugus-S III	7/14/04	39,800	na	8260B	<50	2,400	<50	<50	<50
CW-11A	Saugus-S III	9/17/04	42,500	na	8260B	<25	1,900	<25	<25	<25
CW-11A	Saugus-S III	1/14/05	42,900	na	8260B	<50	2,300	<50	50 UJ	<50
CW-11A	Saugus-S III	4/6/05	45,800	20	8260B	<50	2,800	<50	<50	<50
CW-11A	Saugus S-III	7/20/05	45,900 J	na	8260B	<25	2,000	<25	<25	<25
CW-11B	Saugus-S III	5/4/04	17.1	na	8260B	<1.0	<1.0	<1.0	<1.0	<1.0
CW-11B	Saugus-S III	7/15/04	6.7	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
CW-11B	Saugus-S III	9/15/04	<4.0	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
CW-11B	Saugus-S III	1/12/05	<4.0	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
CW-11B	Saugus-S III	4/5/05	15.5	<3.9	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
CW-11B-FD		4/5/05	15.0	<3.9	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
CW-11B	Saugus-S III	7/18/05	<4.0	na	524.2	<0.50	0.54	<0.50	<0.50	<0.50
CW-12A	Saugus S-III	4/29/04	5,620	na	524.2	1.6	39	0.51	<0.50	<0.50
CW-12A	Saugus S-III	7/20/04	8,120	na	524.2	<0.50	46	0.72	<0.50	<0.50
CW-12A	Saugus S-III	9/15/04	3,470	na	8260B	<1.0	21	<1.0	<1.0	<1.0
CW-12A	Saugus S-III	1/14/05	10,200	na	524.2	<4.2	330	<4.2	<4.2	<4.2
CW-12A	Saugus S-III	4/6/05	9,840	10	524.2	<0.50	73	1.4	<0.50	<0.50
CW-12A-FD		4/5/05	9,840	12	524.2	<0.50	79	1.5	<0.50	<0.50
CW-12A	Saugus S-III	7/20/05	625 J	na	524.2	<0.50	47	2.2	<0.50	<0.50
CW-12B	Saugus S-III	4/29/04	150	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
CW-12B	Saugus S-III	7/16/04	1,340	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
CW-12B	Saugus S-III	9/14/04	231	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
CW-12B	Saugus S-III	1/13/05	220	na	524.2	<0.50	0.94	<0.50	<0.50	<0.50
CW-12B	Saugus S-III	4/5/05	1,980	<3.9	524.2	<0.50	1.6	<0.50	<0.50	<0.50
CW-12B	Saugus S-III	7/19/05	180 UJ	na	524.2	<0.50	0.68	<0.50	<0.50	<0.50
CW-12B-FD		7/19/05	171 UJ	na	524.2	<0.50	0.65	<0.50	<0.50	<0.50
CW-13A	Saugus S-III	9/17/04	5,440	na	8260B	<2.5	120	<2.5	<2.5	<2.5
CW-13A	Saugus S-III	1/14/05	4,050	na	8260B	<25	190	<25	<25	<25
CW-13A	Saugus S-III	4/8/05	254,000	na	8260B	<5.0	330	<5.0	<5.0	<5.0
CW-13A	Saugus S-III	7/27/05	24,600	na	8260B	<5.0	240	<5.0	<5.0	<5.0
CW-13B	Saugus-S III	7/21/04	10	na	8260B	<1.0	<1.0	<1.0	<1.0	<1.0
CW-13B	Saugus S-III	9/13/04	14.5	<3.9	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
CW-13B	Saugus S-III	1/11/05	28.6	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
CW-13B-FD		1/11/05	28.2	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
CW-13B	Saugus S-III	4/6/05	<30	<7.6	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
CW-13B	Saugus S-III	7/27/05	27	na	524.2	<0.50	<0.5	<0.50	<0.50	<0.50
CW-13C	Saugus-S III	7/21/04	<4.0	na	8260B	<1.0	<1.0	<1.0	<1.0	<1.0
CW-13C	Saugus S-III	9/16/04	8.4	<10	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
CW-13C	Saugus S-III	1/11/05	<4.0	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
CW-13C	Saugus S-III	4/7/05	<4.0	<3.9	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
CW-13C-FD		4/7/05	<4.0	<3.9	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
CW-13C	Saugus S-III	7/20/05	4 UJ	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50

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TABLE 7. SUMMARY OF QUARTERLY GROUNDWATER ANALYTICAL RESULTS - PERCHLORATE, CHLORATE, AND FREQUENTLY DETECTED VOCs
Former Whittaker Corporation Bermite Facility; Santa Clarita, California

Well No.	Aquifer (Prelim.)	Sample Date	Perchlorate (µg/l)	Chlorate (µg/l)	EPA Method (VOCs)	PCE (µg/l)	TCE (µg/l)	cis-1,2-DCE (µg/l)	1,1-DCE (µg/l)	1,1,1-TCA (µg/l)
CW-14	Saugus-S III	7/23/04	<8.0	na	8260B	<1.0	<1.0	<1.0	<1.0	<1.0
CW-14	Saugus S-III	9/17/04	<8.0	<10	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
CW-14	Saugus S-III	1/14/05	<20	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
CW-14	Saugus S-III	4/8/05	21.1	20 UJ	524.2	<0.50	0.67	<0.50	<0.50	<0.50
CW-14	Saugus S-III	7/28/05	<8.0	na	524.2	<0.50	0.79	<0.50	<0.50	<0.50
CW-14-FD		7/28/05	<8.0	na	524.2	<0.50	0.83	<0.50	<0.50	<0.50
CW-15	Saugus-S III	7/26/04	<4.0	<10	8260B	<1.0	<1.0	<1.0	<1.0	<1.0
CW-15	Saugus S-III	9/14/04	<4.0	<3.9	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
CW-15	Saugus S-III	1/17/05	<4.0	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
CW-15	Saugus S-III	4/8/05	59.8	3.9 UJ	524.2	<0.50	0.54	<0.50	<0.50	<0.50
CW-15	Saugus S-III	7/27/05	<4.0	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
CW-16A	Saugus S-III	4/4/05	12,800	15	8260B	<12	980	<12	<12	<12
CW-16A	Saugus S-III	7/27/05	12,300	na	8260B	<10	490	<10	<10	<10
CW-16B	Saugus S-III	4/22/05	6.8	10	8260B	<1.0	<1.0	<1.0	<1.0	<1.0
CW-16B	Saugus S-III	7/28/05	<8.0	<3.9	8260B	<1.0	<1.0	<1.0	<1.0	<1.0
CW-16B-FD		7/28/05	<8.0	<3.9	8260B	<1.0	<1.0	<1.0	<1.0	<1.0
OS-MW-1A	Saugus S-I	4/28/04	4.8	na	524.2	0.50UJ	0.50UJ	0.50UJ	0.50UJ	0.50UJ
OS-MW-1A	Saugus S-I	7/22/04	<4.0	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
OS-MW-1A	Saugus S-I	9/16/04	4.7	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
OS-MW-1A	Saugus S-I	1/18/05	4.3	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
OS-MW-1A	Saugus S-I	4/18/05	<4.0	<3.9	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
OS-MW-1A	Saugus S-I	7/28/05	6.1	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
OS-MW-1B	Saugus S-III	4/28/04	105	na	524.2	0.50UJ	0.50UJ	0.50UJ	0.50UJ	0.50UJ
OS-MW-1B	Saugus S-III	7/22/04	32.3	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
OS-MW-1B	Saugus S-III	9/16/04	132	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
OS-MW-1B-FD		9/16/04	132	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
OS-MW-1B	Saugus S-III	1/18/05	<4.0	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
OS-MW-1B	Saugus S-III	4/19/05	108	34	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
OS-MW-1B	Saugus S-III	7/26/05	94	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
OS-MW-1C	Saugus S-III	4/27/04	9.8	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
OS-MW-1C	Saugus S-III	7/23/04	5.1	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
OS-MW-1C	Saugus S-III	9/17/04	8.4	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
OS-MW-1C	Saugus S-III	1/17/05	4.6	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
OS-MW-1C-FD		1/17/05	5.3	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
OS-MW-1C	Saugus S-III	4/18/05	5.4	20	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
OS-MW-1C	Saugus S-III	7/22/05	5.8	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
OS-MW-2A	Alluvium	7/16/04	116	65	8260B	110	16	<2.0	19	42
OS-MW-2A	Alluvium	9/16/04	139	67	8260B	69	13	<1.0	24	26
OS-MW-2A	Alluvium	1/14/05	91.5	na	524.2	32	8.2	<0.50	11	14
OS-MW-2A	Alluvium	4/8/05	82.9	57	524.2	49 J	9.5 J	0.5 UJ	14 J	17
OS-MW-2A	Alluvium	7/22/05	<4.0	na	524.2	5.0	1.2	<0.50	1.4	0.61

TABLE 7. SUMMARY OF QUARTERLY GROUNDWATER ANALYTICAL RESULTS - PERCHLORATE, CHLORATE, AND FREQUENTLY DETECTED VOCs
Former Whittaker Corporation Bermite Facility; Santa Clarita, California

Well No.	Aquifer (Prelim.)	Sample Date	Perchlorate (µg/l)	Chlorate (µg/l)	EPA Method (VOCs)	PCE (µg/l)	TCE (µg/l)	cis-1,2-DCE (µg/l)	1,1-DCE (µg/l)	1,1,1-TCA (µg/l)
OS-MW-2B	Alluvium	7/16/04	111	61	8260B	77	16	<1.0	31	36
OS-MW-2B	Alluvium	9/16/04	127	66	8260B	38	9.4 J	<1.0	12 J	14
OS-MW-2B	Alluvium	1/14/05	32.7	na	524.2	3.4	1.2	<0.50	1.8	1.2
OS-MW-2B	Alluvium	4/6/05	16.8	49	524.2	3.2 J	0.77 J	0.5 UJ	0.79 J	0.84
OS-MW-2B-FD		4/6/05	19.0	47	524.2	3.4 J	0.83 J	0.5 UJ	0.84 J	0.94
OS-MW-2B	Alluvium	7/22/05	<4.0	na	524.2	0.71	<0.50	<0.50	<0.50	<0.50
OS-MW-2B-FD		7/22/05	<4.0	na	524.2	0.72	<0.50	<0.50	<0.50	<0.50
OS-MW-3A	Alluvium	4/28/04	138	61	524.2	78 J	14 J	0.63 J	27 J	44 J
OS-MW-3A	Alluvium	7/16/04	135	61	524.2	86	19	<1.0	27	43
OS-MW-3A	Alluvium	9/16/04	159	61	8260B	84	19	<1.0	34	33
OS-MW-3A	Alluvium	1/19/05	43.4	na	524.2	5.9	1.8	<0.50	1.2	1.6
OS-MW-3A	Alluvium	4/6/05	9.9	54	524.2	1.2 J	0.5 UJ	0.5 UJ	0.5 UJ	<0.50
OS-MW-3A	Alluvium	7/22/05	11.8	na	524.2	2.0	0.52	<0.50	<0.50	<0.50
OS-MW-3B	Saugus	7/23/04	<4.0	<10	8260B	<1.0	<1.0	<1.0	<1.0	<1.0
OS-MW-3B	Saugus	9/16/04	<4.0	<10	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
OS-MW-3B	Saugus	1/20/05	<4.0	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
OS-MW-3B	Saugus	4/6/05	11.4	<3.0	524.2	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	<0.50
OS-MW-3B	Saugus	7/29/05	<4.0	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
OS-MW-4A	Alluvium	7/22/04	5.7	34	8260B	<1.0	<1.0	<1.0	<1.0	<1.0
OS-MW-4A	Alluvium	9/16/04	6.3	47	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
OS-MW-4A	Alluvium	1/19/05	<4.0	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
OS-MW-4A	Alluvium	4/6/05	<4.0	62	524.2	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	<0.50
OS-MW-4A	Alluvium	7/27/05	<4.0	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
OS-MW-4B	Alluvium	7/22/04	33.5	38	8260B	<1.0	<1.0	<1.0	<1.0	<1.0
OS-MW-4B	Alluvium	9/16/04	9.1	47	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
OS-MW-4B	Alluvium	1/19/05	<4.0	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
OS-MW-4B	Alluvium	4/6/05	<4.0	61	524.2	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	<0.50
OS-MW-4B	Alluvium	7/27/05	<4.0	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
AL-12A	Alluvium	11/23/04	<4.0	na	8260B	<1.0	<1.0	<1.0	<1.0	<1.0
AL-12A	Alluvium	1/18/05	<4.0	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
AL-12A	Alluvium	4/14/05	68.3	21	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
AL-12A	Alluvium	7/27/05	<4.0	na	524.2	<0.50	1.3	<0.50	<0.50	<0.50
AL-12B	Alluvium	11/24/04	31.6	na	8260B	<5.0	7.0	<1.0	<1.0	<1.0
AL-12B	Alluvium	1/18/05	10	na	524.2	<0.50	2.4	<0.50	<0.50	<0.50
AL-12B-FD		1/18/05	9.2	na	524.2	<0.50	2.7	<0.50	<0.50	<0.50
AL-12B	Alluvium	4/14/05	<8.0	5,100	524.2	0.69	3.8	<0.50	<0.50	<0.50
AL-12B	Alluvium	7/27/05	19.3	na	524.2	<1.0	24 J	<1.0	<1.0	<1.0
SG1-HSU1	Saugus S-I	11/23/04	<4.0	na	8260B	<1.0	<1.0	<1.0	<1.0	<1.0
SG1-HSU1	Saugus S-I	1/18/05	<4.0	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
SG1-HSU1	Saugus S-I	4/14/05	5.3	140	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
SG1-HSU1	Saugus S-I	7/27/05	<4.0	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50

TABLE 7. SUMMARY OF QUARTERLY GROUNDWATER ANALYTICAL RESULTS - PERCHLORATE, CHLORATE, AND FREQUENTLY DETECTED VOCs
Former Whittaker Corporation Bermite Facility; Santa Clarita, California

Well No.	Aquifer (Prelim.)	Sample Date	Perchlorate (µg/l)	Chlorate (µg/l)	EPA Method (VOCs)	PCE (µg/l)	TCE (µg/l)	cis-1,2-DCE (µg/l)	1,1-DCE (µg/l)	1,1,1-TCA (µg/l)
Perched Groundwater Zones										
OU1Ds-DB-02B	Perched	6/4/04	6,800	na	8260B	<1.0	<1.0	<1.0	<1.0	<1.0
OU1Ds-DB-02B	Perched	7/23/04	6,150	na	8260B	<1.0	<1.0	<1.0	<1.0	<1.0
OU1Ds-DB-02B	Perched	9/21/04	5,630	na	8260B	<1.0	<1.0	<1.0	<1.0	<1.0
OU1Ds-DB-02B	Perched	1/20/05	7,960	na	8260B	<1.0	<1.0	<1.0	<1.0	<1.0
OU1Ds-DB-02B	Perched	4/19/05	5,780	<3.9	8260B	<1.0	<1.0	<1.0	<1.0	<1.0
OU1Ds-DB-02B	Perched	7/29/05	35,300	na	8260B	<1.0	<1.0	<1.0	<1.0	<1.0
EX-4	Perched	4/30/04	5,810	<10	8260B	<10	540	<10	<10	<10
EX-4	Perched	7/15/04	3,180	na	8260B	<6.2	500	<6.2	<6.2	<6.2
EX-4-FD		7/15/04	2,779	na	8260B	<6.2	520	<6.2	<6.2	<6.2
EX-4	Perched	9/20/04	6,330 J	na	8260B	<10	450	<10	<10	<10
EX-4	Perched	1/20/05	3,300	na	8260B	<5.0	290	<5.0	<5.0	<5.0
EX-4	Perched	4/19/05	4,930	<3.9	8260B	<5.0	380	<5.0	<5.0	<5.0
EX-4	Perched	7/29/05	8,390	na	8260B	<10	530	<10	<10	<10
P-9	Perched	8/17/04	179,000	na	–	na	na	na	na	na
P-9	Perched	1/11/05	na	na	8260B	<12	1,000	<12	<12	<12
P-9	Perched	4/11/05	177,000	na	8260B	<20	2,000	<20	<20	<20
P-9	Perched	8/1/05	155,000	na	8260B	<12	930	<12	<12	<12
P-12	Perched	9/17/04	509	na	–	na	na	na	na	na
P-12	Perched	1/13/05	267	na	8260B	<1.0	53	<1.0	<1.0	<1.0
P-12	Perched	4/14/05	372	na	8260B	<2.0	87	<2.0	<2.0	<2.0
P-12	Perched	8/1/05	344	na	8260B	<1.0	65	<1.0	<1.0	<1.0
P-13	Perched	9/22/04	122	na	–	na	na	na	na	na
P-13	Perched	1/20/05	413	na	8260B	<1.0	13	<1.0	<1.0	<1.0
P-13	Perched	4/14/05	508	na	8260B	<1.0	18	<1.0	<1.0	<1.0
P-13	Perched	7/26/05	1,780	na	8260B	<1.0	10	<1.0	<1.0	<1.0
P-14	Perched	9/22/04	1,600	na	–	na	na	na	na	na
OU2-PW-1	Perched	5/4/04	139,000	61	8260B	250 UJ	9,400 J	250 UJ	250 UJ	250 UJ
OU2-PW-1	Perched	7/21/04	132,000	na	8260B	<250	8,500	<250	<250	<250
OU2-PW-1	Perched	9/20/04	135,000 J	na	8260B	<250	7,900	<250	<250	<250
OU2-PW-1	Perched	1/20/05	111,000	na	8260B	<100	7,100	<100	<100	<100
OU2-PW-1	Perched	4/8/05	110,000	58 J	8260B	<200	8,700	<200	<200	<200
OU2-PW-1	Perched	7/26/05	9,000	na	8260B	<12	1,000	<12	<12	<12
OU2-PW-2	Perched	4/30/04	1,980	<10	8260B	<1.0	59	<1.0	<1.0	<1.0
OU2-PW-2	Perched	7/21/04	16,300	na	8260B	<10	430	<10	<10	<10
OU2-PW-2	Perched	9/21/04	8,330	na	8260B	<5.0	280	<5.0	<5.0	<5.0
OU2-PW-2-FD		9/21/04	8,420	na	8260B	<5.0	260	<5.0	<5.0	<5.0
OU2-PW-2	Perched	1/20/05	6,250	na	8260B	<5.0	300	<5.0	<5.0	<5.0
OU2-PW-2	Perched	4/14/05	14,500	<3.9	8260B	<10	450	<10	<10	<10
OU2-PW-2-FD		4/14/05	14,600	<3.9	8260B	<10	460	<10	<10	<10
OU2-PW-2	Perched	7/29/05	11,600	na	8260B	<10	570	<10	<10	<10

TABLE 7. SUMMARY OF QUARTERLY GROUNDWATER ANALYTICAL RESULTS - PERCHLORATE, CHLORATE, AND FREQUENTLY DETECTED VOCs
Former Whittaker Corporation Bermite Facility; Santa Clarita, California

Well No.	Aquifer (Prelim.)	Sample Date	Perchlorate (µg/l)	Chlorate (µg/l)	EPA Method (VOCs)	PCE (µg/l)	TCE (µg/l)	cis-1,2-DCE (µg/l)	1,1-DCE (µg/l)	1,1,1-TCA (µg/l)
OU2-PW-3	Perched	4/27/04	121,000	<10	8260B	<50	3,000	<50	<50	<50
OU2-PW-3	Perched	7/20/04	127,000	na	8260B	<50	2,600	<50	<50	<50
OU2-PW-3	Perched	9/22/04	137,000	na	8260B	<50	2,700	<50	<50	<50
OU2-PW-3	Perched	1/20/05	129,000	na	8260B	<50	2,900	<50	<50	<50
OU2-PW-3-FD		1/20/05	113,000	na	8260B	<50	3,300	<50	<50	<50
OU2-PW-3	Perched	4/8/05	124,000	3.9 UJ	8260B	<50	3,300	<50	<50	<50
OU2-PW-3	Perched	7/29/05	109,000	na	8260B	<25	1,800	<25	<25	<25
OU2-PW-3-FD		7/29/05	132,000	na	8260B	<25	1,900	<25	<25	<25
OU2-PW-4	Perched	4/27/04	12,700	na	8260B	<1.0	460	<1.0	<1.0	<1.0
OU2-PW-4	Perched	7/20/04	318	na	8260B	<1.0	9.8	<1.0	<1.0	<1.0
OU2-PW-4-FD		7/20/04	376	na	8260B	<1.0	9.5	<1.0	<1.0	<1.0
OU2-PW-4	Perched	9/20/04	291 J	na	8260B	<1.0	9.2	<1.0	<1.0	<1.0
OU2-PW-4	Perched	1/20/05	288	na	8260B	<1.0	11	<1.0	<1.0	<1.0
OU2-PW-4	Perched	4/20/05	334	<3.9	8260B	<1.0	15	<1.0	<1.0	<1.0
OU2-PW-4	Perched	7/29/05	448	na	8260B	<1.0	17	<1.0	<1.0	<1.0
OU2-PW-5	Perched	4/30/04	286	<10	8260B	<1.0	12	<1.0	<1.0	<1.0
OU2-PW-5-FD		4/30/04	276	<10	8260B	<1.0	11	<1.0	<1.0	<1.0
OU2-PW-5	Perched	7/20/04	8,520	na	8260B	<10	420	<10	<10	<10
OU2-PW-5	Perched	9/22/04	7,010	na	8260B	<10	650	<10	<10	<10
OU2-PW-5	Perched	1/20/05	3,450	na	8260B	<25	180	<25	<25	<25
OU2-PW-5-FD		1/20/05	3,450	na	8260B	<25	190	<25	<25	<25
OU2-PW-5	Perched	4/15/05	20,400	<3.9	8260B	<10	480	<10	<10	<10
OU2-PW-5	Perched	7/29/05	3,700	na	8260B	<2.5	160	<2.5	<2.5	<2.5
OU2-PW-6	Perched	7/22/04	19,600	na	8260B	<5.0	230	<5.0	<5.0	<5.0
OU2-PW-6	Perched	9/21/04	22,900	na	8260B	<2.5	160	<2.5	<2.5	<2.5
OU2-PW-6	Perched	1/20/05	20,800	na	8260B	<5.0	200	<5.0	<5.0	<5.0
OU2-PW-6	Perched	4/14/05	38,200	<78	8260B	<4.0	270	<4.0	<4.0	<4.0
OU2-PW-6	Perched	7/29/05	39,400	na	8260B	<5.0	250	<5.0	<5.0	<5.0
OU6-PW-1	Perched	5/3/04	147,000	na	8260B	<62	4,500	<62	<62	<62
OU6-PW-1	Perched	7/21/04	201,000	na	8260B	<100	9,000	<100	<100	<100
OU6-PW-1	Perched	9/20/04	169,000 J	na	524.2	<25	4,500	<25	<25	<25
OU6-PW-1	Perched	1/20/05	159,000	na	8260B	<50	3,600	<50	<50	<50
OU6-PW-1-FD		1/20/05	169,000	na	8260B	<50	3,500	<50	<50	<50
OU6-PW-1	Perched	4/19/05	194,000	<39	8260B	<62	4,000	<62	<62	<62
OU6-PW-1	Perched	7/22/05	149,000	na	8260B	<33	3,300	<33	<33	<33
CW-16-P	Perched	4/20/05	53.8	<3.9	8260B	120	690	<20	<20	<20
14-PW-2	Perched	5/4/04	488	<10	8260B	<1.0	28	<1.0	<1.0	<1.0
14-PW-2	Perched	7/15/04	403	na	8260B	<1.0	35	<1.0	<1.0	<1.0
14-PW-2	Perched	9/16/04	469	na	8260B	<1.0	21	<1.0	<1.0	<1.0
14-PW-2	Perched	1/21/05	433	na	8260B	<1.0	17	<1.0	<1.0	<1.0
14-PW-2	Perched	4/19/05	283	<3.9	8260B	<1.0	18	<1.0	<1.0	<1.0
14-PW-2-FD		4/19/05	276	<3.9	8260B	1.1	20	<1.0	<1.0	<1.0
14-PW-2	Perched	7/29/05	309	na	8260B	4.2	140	<2.0	<2.0	<2.0

TABLE 7. SUMMARY OF QUARTERLY GROUNDWATER ANALYTICAL RESULTS - PERCHLORATE, CHLORATE, AND FREQUENTLY DETECTED VOCs

Former Whittaker Corporation Bermite Facility; Santa Clarita, California

Well No.	Aquifer (Prelim.)	Sample Date	Perchlorate (µg/l)	Chlorate (µg/l)	EPA Method (VOCs)	PCE (µg/l)	TCE (µg/l)	cis-1,2-DCE (µg/l)	1,1-DCE (µg/l)	1,1,1-TCA (µg/l)
14-PW-3	Perched	5/5/04	46,900	<10	8260B	55,000	<1,000	<1,000	<1,000	<1,000
14-PW-3	Perched	7/16/04	93,700	na	8260B	80,000	<2,500	<2,500	<2,500	<2,500
14-PW-3	Perched	9/22/04	117,000	na	8260B	89,000	<1,200	<1,200	<1,200	<1,200
14-PW-3	Perched	1/21/05	48,400	na	8260B	67,000	<2,500	<2,500	<2,500	<2,500
14-PW-3-FD		1/21/05	57,900	na	8260B	68,000	<2,500	<2,500	<2,500	<2,500
14-PW-3	Perched	4/20/05	12,500	<3.9	8260B	120,000	<2,000	<2,000	<2,000	<2,000
14-PW-3	Perched	8/9/05	30,100	na	8260B	57,000	<620	<620	<620	<620
14-PW-3 -FD		8/9/05	27,900	na	8260B	60,000	<620	<620	<620	<620
17-PW-1	Perched	5/5/04	5,568	<10	8260B	1.2 J	1.0 UJ	9.0 J	1.0 UJ	1.0 UJ
17-PW-1-FD		5/5/04	5,700	<10	8260B	<1.0	1.0 UJ	9.2	<1.0	<1.0
17-PW-1	Perched	7/15/04	10,500	na	8260B	1.1	<1.0	8.2	<1.0	<1.0
17-PW-1	Perched	9/21/04	9,410	na	8260B	<1.0	<1.0	5.5	<1.0	<1.0
17-PW-1	Perched	1/21/05	12,600	na	8260B	<1.0	<1.0	5.9	<1.0	<1.0
17-PW-1-FD		1/21/05	12,500	na	8260B	<1.0	<1.0	5.9	<1.0	<1.0
17-PW-1	Perched	4/13/05	14,100	<7.8	8260B	<1.0	<1.0	8.1	<1.0	<1.0
17-PW-1	Perched	7/28/05	9,230	na	8260B	<1.0	<1.0	4.3	<1.0	<1.0
41-PW-1	Perched	7/14/04	109	na	8260B	<1.0	<1.0	<1.0	<1.0	<1.0
41-PW-1	Perched	9/17/04	91.3	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
41-PW-1	Perched	1/20/05	245	na	8260B	<0.50	<0.50	<0.50	<0.50	<0.50
41-PW-1	Perched	4/18/05	117	<3.9	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
41-PW-1	Perched	7/29/05	130	na	8260B	<1.0	1.8	<1.0	<1.0	<1.0
50-PW-1	Perched	7/14/04	806	na	8260B	<1.0	<1.0	<1.0	<1.0	<1.0
50-PW-1	Perched	9/20/04	876 J	<10	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
60-PW-1-FD		9/20/04	759 J	na	524.2	<0.50	<0.50	<0.50	<0.50	<0.50
50-PW-1	Perched	1/20/05	788	na	8260B	<1.0	<1.0	<1.0	<1.0	<1.0
50-PW-1	Perched	4/15/05	906	<3.9	8260B	<1.0	<1.0	<1.0	<1.0	<1.0
50-PW-1	Perched	7/27/05	873	na	8260B	<1.0	<1.0	<1.0	<1.0	<1.0

Notes:

All units are in micrograms per liter (µg/l), or parts per billion

FD = duplicate sample

<xx = Analyte not detected above the indicated detection limit

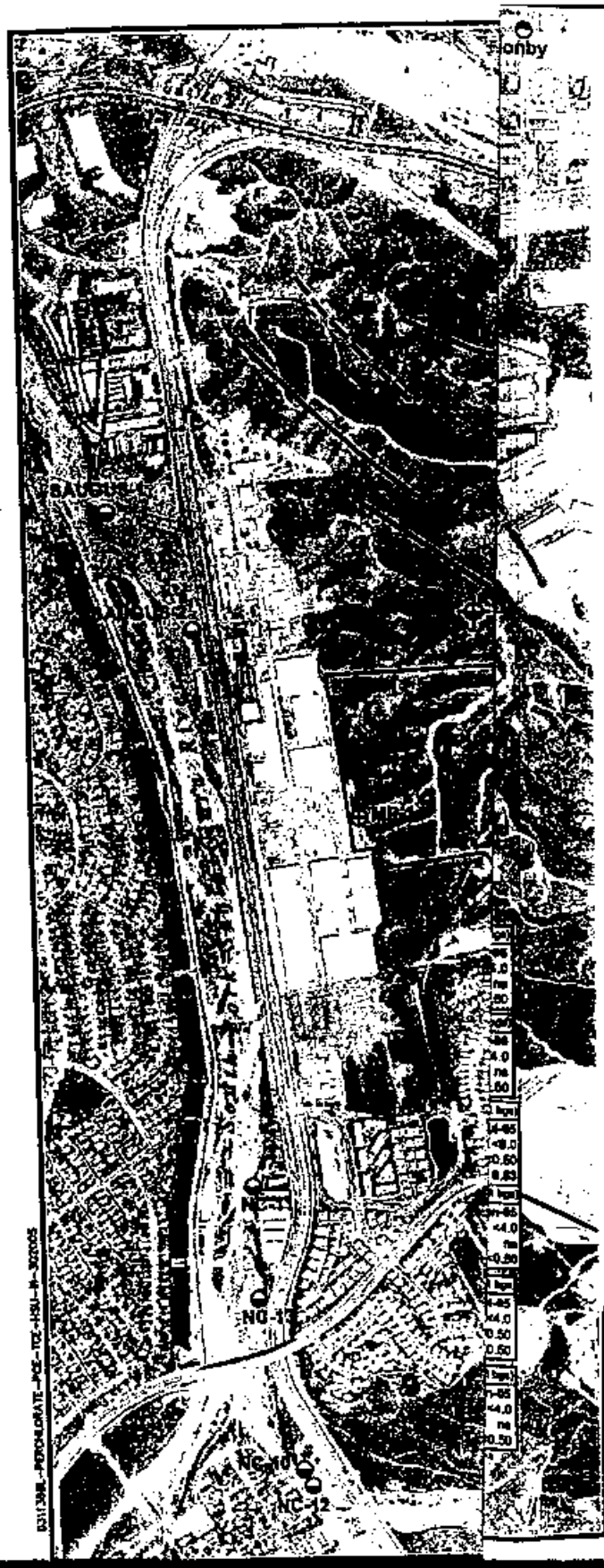
na = not analyzed

J = Estimated concentration

UJ = The analyte was analyzed for, but it was not detected and the sample detection limit is an estimated quantity.

Y:\Whittaker\Bermite\03-11368L_Oxbylton\2005Q3\Tables
Table7_Historic_Analytical_2005Q3.xls

ENVIRON



EXPLANATION:

Existing Well Location

- Alluvium Production Well
- Saugus Production Well
- Saugus Monitoring Well

USACE RI Monitoring Wells

- Single Screen
- Multiport

San Gabriel Fault Zone

- Fault dashed where approximate, dotted where concealed
- OU-5 Site Operable Unit

NOTES:

CW-11A (322-337 ft bgs) = Well name and screen interval

ft bgs = feet below ground surface

PCE = Tetrachloroethene

TCE = Trichloroethene

J = Analyte positively identified; the reported concentration is approximate.

UJ = Analyte not detected, but the reported quantitation limit is approximate.

Chemical concentrations are in µg/l (parts per billion)

* Indicates Suburnit HSU S-IIIa

N

0 1200 2400

SCALE IN FEET

ENVIRON

Perchlorate, PCE, and TCE Concentrations - Saugus Formation HSU S-III
Third Quarter 2005
Santa Clarita, California

DATE	CONTRACT NUMBER	FIGURE
1/26/05	03-1136BL	4c
DRAWN RS	APPROVED	

World Cup

SPORTS

Daily News
dailynews.com/santaclarita

NTA CLARITA
EDITION

TUESDAY JUNE 13, 2006

50 Cents

WEATHER

June gloom
Highs: 74-79
Lows: 53-57
Air quality:
Moderate

For details, see back of Business

t discovered in well water

ket fuel component in low concentrations

ale level for safe drinking water is about 6 parts per billion.

"It was detected at a very low concentration," Jose Diaz, project manager with the state Department of Toxic Substances Control overseeing cleanup at Whittaker-Bermite, said Monday. "We're doing investigations in the general vicinity of that well to determine where the plume extends."

Perchlorate in high doses has been connected to thyroid problems. One part per billion is roughly the volume of one grain of sand in an Olympic-size swimming pool.

The well, which taps into the deep Saugus Aquifer, is located within 1,000 feet of another well that was capped due to perchlorate contamination in 1998.

Decades of munitions testing and manufacturing at the 996-acre Whittaker—Bermite property north of Soledad Canyon Road has left a chemical plume in the aquifer — one of Santa Clarita Valley's prime water sources.

Eight water wells — including NC-13 — have tested positive for perchlorate. Though officials are unsure about the exact size of the plume, studies by the U.S. Army Corps of Engineers suggest it is moving west and northwest, Diaz said.

Officials with Whittaker Corp., which is charged with decontaminating the property, did not return calls for comment Monday. But Cole said the company will pay for the construction of a monitoring well between NC-13 and the Bermite property.

"They will be able to pull samples from those special zones as far as what effects it has on our wells in case of increase concentration," he said. "It'll give us data in overall risks that's out there."

PIZZERIA

World Cup

California Regional Water Quality Control Board

Los Angeles Region

Recipient of the 2001 *Environmental Leadership Award* from Keep California Beautiful

Dr. Alan Lloyd
Secretary for Environmental Protection

320 W. 4th Street, Suite 200, Los Angeles, California 90013
Phone (213) 576-6600 FAX (213) 576-6640 - Internet Address: http://www.waterboards.ca.gov/losangeles

Arnold Schwarzenegger
Governor

December 20, 2005

Mr. James F. Stahl
Chief Engineer and General Manager
County Sanitation Districts
1955 Workman Mill Road
Whittier, California 90607-4998

CERTIFIED MAIL
RETURN RECEIPT REQUESTED
NO. 7003 3110 0003 3258 4325

COMPLAINT NO. R4-2005-0045 FOR MANDATORY MINIMUM PENALTIES AGAINST THE COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY, 28185 THE OLD ROAD, VALENCIA, CA (ORDER NOS. 95-081 AND R4-2003-0145, NPDES PERMIT NO. CA0054216, CI-4993)

Dear Mr. James F. Stahl:

Enclosed is Complaint No. R4-2005-0045 for Mandatory Minimum Penalties in the amount of $246,000 against County Sanitation Districts of Los Angeles County (hereinafter Permittee) for violation of waste discharge requirements contained in Regional Board Order Nos. 95-081 and R4-2003-0145. Also enclosed for your information is a copy of the Regional Board Revised Procedures for the Conduct of Hearing Panel Proceedings.

Unless waived, a hearing before the Regional Water Quality Control Board, Los Angeles Region (Regional Board) or Regional Board Hearing Panel (Hearing Panel) will be held on this Complaint pursuant to California Water Code (CWC) §§ 13228.14 and 13323. Should the Permittee choose to waive its right to a hearing, an authorized agent must sign the waiver form attached to Complaint No. R4-2005-0045 and return it to the Regional Board by January 23, 2006. If we do not receive the waiver and payment of the full mandatory minimum penalty, or partial payment and proof of payment of the balance to a Regional Board-approved Supplemental Environmental Project (SEP) by January 23, 2006, this matter will be heard before the Regional Board or Hearing Panel. An agenda containing the date, time, and location of the hearing will be mailed to you not less than ten (10) days prior to the hearing date.

The Regional Board or Hearing Panel will hear the staff presentation, any evidence and argument the Permittee wishes to present, and any comments offered by interested parties. To ensure that the Regional Board or Hearing Panel members are given the opportunity to fully study and consider the information the Permittee wishes to present at the hearing, all documentation that the Permittee desires to be considered must be submitted to this office at least five (5) working days prior to the date of the hearing. The documentation must include: (a) any written comments, (b) a list identifying each witness to be called, and (c) the estimated time required by witnesses to present testimony. Failure to comply with these requirements is grounds for the

Regional Board or Hearing Panel to refuse to admit the proposed written comments or exhibits into evidence (Title 23, California Code of Regulations, § 648.4).

The Regional Board may allow the Permittee to expend a portion of the mandatory minimum penalty amount on a SEP. The Regional Board approved a list of SEPs in order to facilitate the SEP selection and implementation process. The Permittee may select a pre-approved project from this list to fulfill part of the requirements of Complaint No. R4-2005-0045. The pre-approved SEP list is available on our web site at www.waterboards.ca.gov/losangeles/html/programs/enforcement.html.

Please contact Mr. Hugh Marley at (213) 620-6375 or Ms. Joyce Lee at (213) 620-6369 should you have any questions.

Sincerely,

Jonathan Bishop
Executive Officer

Enclosures

cc: Mr. Michael Lauffer, Office of Chief Counsel, State Water Resources Control Board
Mr. Robert Sams, Office of Chief Counsel, State Water Resources Control Board
Mr. James Maughan, Division of Water Quality, State Water Resources Control Board
Mr. Bill Paznokas, Department of Fish and Game
Ms. Cindy Forbes, Southern California Field Operations Branch, Cal.-DHS/DDWEM
Mr. Kurt Souza, Drinking Water Field Operations Branch, Region V, Cal.-DHS
Ms. Kathryn Barger-Leibrich, Chief Deputy, Fifth District, County of Los Angeles

STATE OF CALIFORNIA
REGIONAL WATER QUALITY CONTROL BOARD
LOS ANGELES REGION

In the matter of:	)	**Complaint No. R4-2005-0045**
	)	**Mandatory Minimum Penalties for**
	)	**Violation of California Water Code § 13376**
County Sanitation Districts of Los Angeles County	)	**And**
Valencia Water Reclamation Plant	)	**Order Nos. 95-081 and R4-2003-0146**
Valencia, California	)	**(NPDES No. CA0054216)**

This Complaint to assess the mandatory minimum penalties pursuant to California Water Code (CWC) § 13385, subdivisions (h) & (i) is issued to County Sanitation Districts of Los Angeles County (hereinafter Permittee) based on findings of violations of waste discharge requirements prescribed in Order Nos. 95-081 and R4-2003-0146 (NPDES No. CA0054216, CI No. 4993).

The Executive Officer (Executive Officer) of the Regional Water Quality Control Board, Los Angeles Region (Regional Board) finds the following:

1. The Permittee operates the Valencia Water Reclamation Plant (hereinafter facility) located at 28185 The Old Road, Valencia. The Permittee can discharge up to 17 million gallons per day (MGD) of tertiary-treated municipal and industrial wastewater at the facility (Latitude 34°25'47", Longitude 118°35'27"). The wastewater is susceptible of containing chloride, cyanide, nitrate plus nitrite (as nitrogen) and other pollutants which can degrade water quality and impact beneficial uses of water, and which are defined as wastes under the Porter-Cologne Water Quality Control Act (CWC § 13000 et seq.). The wastewater flows to the Santa Clara River, a navigable water of the United States.

2. On June 12, 1995 the Regional Board adopted Order No. 95-081, which prescribed waste discharge requirements to the Permittee for the discharge of treated wastes from the facility.

3. Order No. 95-081 (Part I.A., page 6-8) included the following effluent limitations for chloride, cyanide, and nitrogen:

December 20, 2005

Constituent	Unit of Measure	Discharge Limitations (daily maximum)	Discharge Limitations (30-day average)
Chloride	Mg/L	100	--
Chloride	lbs/day	10,508* / 14,178 **	--
Cyanide	µg/L	--	5.2
Cyanide	lbs/day	--	0.55* / 0.74**
Nitrate + Nitrite (as N)	Mg/L	10	--

mg/L = milligrams/liter; µg/L = micrograms/liter
* Mass Emission Rate (MER) of 12.6 MGD (lbs/day = Concentration x MER x 8.34)
** MER beginning May 2003 due to increase in design capacity from 12.6 MGD to 17 MGD

4. On December 6, 2003, the Regional Board adopted Order No. R4-2003-0145, which replaced Order No. 95-081 and prescribes waste discharge requirements to the Permittee for the discharge of treated wastes from the facility.

5. Order No. R4-2003-0145 (Part J, page 32) includes the following interim effluent limitations for cyanide.

Constituent	Unit of Measure	Discharge Limitations (daily maximum)	Discharge Limitations (monthly average)
cyanide	ug/L	-	5.2

µg/L = micrograms/liter

Any discharge containing pollutants violating the effluent limitations set in the waste discharge requirements is prohibited by CWC § 13376.

6. Among the provisions in the Permittee's waste discharge requirements are the requirements to implement a discharge monitoring program and to prepare and submit quarterly NPDES self-monitoring reports to the Regional Board pursuant to the authority of CWC § 13383.

7. Seventy three (73) violations of Order No. 95-081 and eleven (11) violations of Order No. R4-2003-0145 were noted in the Permittee's self-monitoring reports during the period January 2001 through March 2005. These violations include effluent limit exceedances for chloride, cyanide and nitrogen. The violations are identified in Table 1 attached hereto and incorporated herein by reference.

8. CWC § 13385(h) requires the Regional Board to assess a mandatory minimum penalty of three thousand dollars ($3,000) for each serious violation. Pursuant to CWC § 13385(h)(2) a "serious violation" is defined as any waste discharge that violates the effluent limitations contained in the applicable waste discharge requirements for a Group II pollutant, as specified in Appendix A to § 123.45 of Title 40 of the Code of Federal Regulations, by 20 percent or more or for a Group I pollutant, as specified in Appendix A to § 123.45 of Title 40 of the Code of Federal Regulations, by 40 percent or more.

Furthermore, CWC § 13385.1(a)(1) identifies a failure to file a discharge monitoring report required pursuant to CWC § 13383 for each complete period of 30 days following the deadline for submitting the report as a "serious violation."

9. CWC § 13385(i) requires the Regional Board to assess a mandatory minimum penalty of three thousand dollars ($3,000) for each violation whenever the permittee violates a waste discharge requirement effluent limitation in any period of six consecutive months, except that the requirement to assess the mandatory minimum penalty shall not be applicable to the first three violations within that time period.

10. A portion of the penalty not to exceed fifteen thousand dollars ($15,000) plus fifty percent (50%) of the penalty amount that exceeds fifteen thousand dollars ($15,000) may be directed to be expended on a Supplemental Environmental Project (SEP) pursuant to CWC § 13385(l).

11. The maximum amount of administrative civil liability assessable pursuant to CWC § 13385 for each day of violation is $10,000 per day of violation plus $10 times the number of gallons by which the volume discharged but not cleaned up exceeds 1,000 gallons.

YOU ARE HEREBY GIVEN NOTICE THAT:

12. The Executive Officer proposes that the Permittee be assessed a mandatory minimum penalty in the amount of $246,000 for the violations which occurred during January 2001 through March 2005. Refer to Table 1 for the calculation of the amount of mandatory minimum penalty.

13. A hearing shall be conducted on this Complaint by the Regional Board or Regional Board Hearing Panel (Hearing Panel) within 90 days after service of this Complaint on the Permittee pursuant to CWC §§ 13228.14 and 13323. The Permittee will be notified of the date, time and location of the hearing. The Permittee may waive the right to a hearing. Should the Permittee choose to waive the right to a hearing, an authorized agent must sign the waiver form attached to this Complaint and return the executed waiver to the Regional Board at 320 West 4th Street, Suite 200, Los Angeles, CA 90013, to be received by the Regional Board by the close of business on January 23, 2005. If the hearing is waived, the following options are available to satisfy the civil liability:

    a. A check in the amount of $246,000 (payable to the State Water Resources Control Board Cleanup and Abatement Account) shall accompany the signed waiver; or

    b. The Permittee may pay up to $130,500 of the civil liability by contributing to a SEP on the Regional Board approved SEP List at http://www.waterboards.ca.gov/losangeles/html/programs/enforcement.html. To the greatest degree practicable, there must be a nexus demonstrated with the violations cited in this Complaint and the chosen SEP.

In the event that the Permittee elects to contribute to a SEP, a check in the amount of $115,500 (payable to the State Water Resources Control Board Cleanup and Abatement Account) shall accompany the signed waiver along with a written statement indicating the SEP chosen and proof of payment of the penalty balance to the SEP shall be submitted to the Regional Board by the close of business on January 23, 2006.

14. Notwithstanding the issuance of this Complaint, the Regional Board shall retain the authority to assess additional penalties for violations of the requirements of the Permittee's waste discharge requirements.

15. This enforcement action is exempt from the provisions of the California Environmental Quality Act, California Public Resources Code § 21000 et seq., in accordance with California Code of Regulations, title 14, § 15321.

16. Regulations of the US Environmental Protection Agency require public notification of any proposed settlement of the civil liability occasioned by violation of the Clean Water Act including NPDES permit violations. Accordingly, interested persons will be given 30 days to comment on any proposed settlement of this Complaint.

December 20, 2005

_____
Jonathan Bishop
Executive Officer

Chloride Sources

- Majority of chloride load to SCR from Saugus and Valencia WRPs
- 60% of WRP effluent chloride comes from potable water supply
- Most additional chloride from Self Regenerating Water Softeners (SRWS)
- 2004 ban on new SRWS installation

From RWQCB Presentation

Background
Beneficial Uses and WQOs

- Beneficial Uses
  - Agricultural Supply
  - Groundwater Recharge
  - Aquatic Life Habitat
- Water Quality Objectives
  - Surface Water Quality Objective - 100 mg/l
  - Groundwater Quality Objectives - 100mg/l-200 mg/l

From Regional WQCB

State of California
California Regional Water Quality Control Board, Los Angeles Region

RESOLUTION NO. 2005-002
January 27, 2005

Reiteration of Existing Authority to Regulate Hydromodifications within the Los Angeles Region, and Intent to Evaluate the Need for and Develop as Appropriate New Policy or Other Tools to Control Adverse Impacts from Hydromodification on the Water Quality and Beneficial Uses of Water Courses in the Los Angeles Region

WHEREAS, the California Regional Water Quality Control Board, Los Angeles Region, finds that:

1. Protecting beneficial uses within the Los Angeles Region consistent with the Federal Clean Water Act and the Porter-Cologne Water Quality Control Act (Porter-Cologne Act) requires careful consideration of projects that result in hydrogeomorphic changes and related adverse impacts to the water quality and beneficial uses of waters of the State. The alteration *away from a natural state* of stream flows or the beds or banks of rivers, streams, or creeks, including ephemeral washes, which results in hydrogeomorphic changes, is generally referred to in this resolution as a hydromodification.

2. This resolution is intended to reiterate the existing authority the Regional Board relies upon to regulate hydromodifications within the Los Angeles Region. As such, it has no regulatory effect. This resolution represents a initial step in the process of first, heightening awareness about the potential impacts of hydromodification on water quality and beneficial uses and evaluating existing laws and regulations and the current methods employed by Regional Board staff when reviewing proposed hydromodification projects and, second, strengthening, if necessary, controls and policies governing hydromodifications that negatively affect water quality and beneficial uses. As a first step, it sets forth a process to achieve one of the Regional Board's highest priorities, which is to maintain and restore, wherever feasible, the physical and biological integrity of the Region's water courses. Secondarily, maintaining the natural functions of water courses maximizes opportunities for stormwater conservation and groundwater recharge, which is very important in the semi-arid Los Angeles region where groundwater makes up half of the Region's water supply.

3. In addition to the process outlined in this resolution, the Regional Board has and will continue to strongly support restoration efforts in and along the Region's urbanized, highly modified water courses. The Regional Board also strongly supports preservation efforts geared toward ensuring long-term protection for the Region's remaining natural water courses.

4. Section 101(a) of the Clean Water Act, sets forth a national objective "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." (33 U.S.C. § 1251(a).) Chapter I of the Water Quality Control Plan for the Coastal Watersheds of Los Angeles and Ventura Counties (Basin Plan) recognizes this national goal and specifies that the Basin Plan is designed to implement the Clean Water Act and its goals. As a result, a regional priority of maintaining and restoring, wherever feasible, the physical and biological integrity of the Region's water courses is firmly grounded in federal and state law.

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5. To realize this objective, the Clean Water Act (33 U.S.C. § 1313(c)) and federal regulations (40 C.F.R. § 131.10(a)) direct States to specify appropriate designated uses to be achieved and protected. The classification of the waters of the State must take into consideration the use and value of water for public water supplies, protection and propagation of fish, shellfish and wildlife, recreation in and on the water, agricultural, industrial and other purposes including navigation. The standards must explicitly be designed to "protect the public health or welfare and enhance the quality of the water." (33 U.S.C. § 1313(c).)

6. The Basin Plan designates the beneficial uses of the Region's water bodies consistent with the California Water Code, federal Clean Water Act, federal regulations, and with the national "fishable/swimmable" goal of the CWA forming the broad basis for the beneficial use designations of surface waters throughout the Region. Some of the beneficial uses most benefited by preserving water courses in a natural state include aquatic life [WARM and COLD among others], wetland habitat, and groundwater recharge. In addition, the Basin Plan establishes water quality objectives for the protection of these beneficial uses. An important provision of the Basin Plan, which is required by federal law (40 C.F.R. § 131.12) and state law (SWRCB Resolution No. 68-16), is an anti-degradation policy designed to maintain existing, high quality waters. The beneficial uses of water bodies, water quality objectives and anti-degradation policies, together, constitute a State's water quality standards.

7. The Regional Board primarily relies upon a three-pronged approach to regulating hydromodifications. The first two are (1) waste discharge requirements issued pursuant to Water Code section 13263 and waivers issued pursuant to Water Code section 13269 to protect waters of the State and (2) certifications issued in accordance with Clean Water Act section 401 to protect waters of the U.S. These two approaches are not mutually exclusive. (Cal. Code Regs., tit. 23, § 3857.) The third prong consists of municipal stormwater permits issued pursuant to section 402 (p) of the Clean Water Act to address stormwater related problems including stormwater quality and increased flows.

8. "Waters of the State" include all waters of the U.S. In addition, waters of the State include waters that are not "navigable waters" under the federal Clean Water Act, including certain intermittent and ephemeral streams, wetlands, lakes, reservoirs, and other isolated non-navigable waters.

9. Human civilization has attempted to alter the environment through hydromodifications for centuries. In the Los Angeles Region, beginning in the early part of the 20th century, hydromodifications were constructed by public agencies to protect residents from floods and to collect and conserve stormwater for drinking water purposes and recreation. In addition, extensive urban development, and the corresponding increase in impervious area within the watershed and decrease in the width of natural floodplains, has often resulted in significantly altered patterns of surface runoff and infiltration and, consequently, stream flow. This, in turn, has necessitated further in-stream hydromodification in order to stabilize banks and constrain the stream to the channel to prevent flooding. The sequence of events is discussed extensively in the Basin Plan and in the Regional Board's municipal storm water permit for Los Angeles County. (Regional Board Order No. 01-182.)

10. Many hydromodifications were undertaken with laudable goals often for public safety and welfare, but have later been shown to de-stabilize and enlarge stream channels as well as degrade habitat and reduce species abundance and diversity. As a result, when reviewing

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hydromodification projects it is important to carefully consider whether the immediate improvements sought are designed in such a way as to avoid unintended adverse consequence on the character of the receiving water and its beneficial uses in the vicinity, and downstream of the hydromodification.

11. Activities that alter natural *stream flows* may include increasing the amount of impervious land area within the watershed, altering patterns of surface runoff and infiltration, and channelizing natural water courses. Activities that alter the natural *stream channel* include but are not limited to human-induced straightening, narrowing or widening, deepening, lining, piping/under-grounding, filling or relocating (i.e. channelization); bank stabilization; in-stream activities (e.g. construction, mining, dredging); dams, levees, spillways, drop structures, weirs, and impoundments.

12. Hydromodifications may impair beneficial uses such as warm and cold water habitat, spawning habitat, wetland habitat, and wildlife habitat in a variety of ways. Modifications to stream flow and the stream channel may alter aquatic and riparian habitat and affect the tendency of aquatic and riparian organisms to inhabit the stream channel and riparian zone. As a result of these hydromodifications, the biological community (aquatic life beneficial uses) may be significantly altered, compared to the type of community that would inhabit an unaltered, natural stream.

13. For example, channelization usually involves the straightening of channels and hardening of banks and/or channel bottom with concrete or riprap. These modifications may impair beneficial uses by disturbing vegetative cover, removing habitat; modifying or eliminating instream and riparian habitat; degrading or eliminating benthic communities; increasing scour and erosion as a result of increased velocities, and increasing water temperature when riparian vegetation is removed. The regular maintenance of modified channels may impair beneficial uses by disturbing instream and riparian habitats if not managed properly. These modifications may also, if not managed properly, impair beneficial uses by depriving wetlands and estuarine shorelines of enriching sediments or by excessive deposition in downstream environments; changing the ability of natural systems to both absorb hydraulic energy and filter pollutants from surface waters; and altering habitat for spawning and other critical life stages of aquatic organisms. Hardening of channels may also eliminate opportunities for groundwater recharge in some areas. Furthermore, some hydromodifications may reduce recreational opportunities and may reduce the aesthetic enjoyment of people engaged in recreation in and around the water body.

14. As a result of past hydromodifications, there are few natural stream systems remaining in the region. Water bodies that have not undergone extensive hydromodification such as portions of the Santa Clara River, upper San Gabriel and Los Angeles Rivers, Malibu Creek, Topanga Canyon, coastal streams in the Santa Monica Mountains, and tributaries to these larger rivers provide immeasurable benefits to the Region. These benefits include high quality warm and cold-water aquatic habitat, spawning habitat, migratory pathways, wildlife corridors, wildlife and riparian habitat, wetland habitat, recreational and aesthetic enjoyment, and groundwater recharge. Yet, many of these water bodies and their tributaries continue to be threatened by expanding urban development.

15. The Regional Board acknowledges that there is a wide array of hydromodification projects. Some result in positive environmental impacts such as stream restoration projects. Others result in negligible or temporary adverse environmental impacts if managed properly. These may include widening bridges and installing flow measuring devices, such as weirs, or energy

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dissipating devices where a constructed channel meets a natural channel. On the other end of the continuum are large hydromodification projects or multiple projects with cumulative impacts that permanently alter the hydrologic and ecological functions of a stream and, thus, adversely affect the beneficial uses described above. These include, but are not limited to, projects that bury natural stream channels, channelize natural water courses, or involve instream activities such as mining or construction. Regional Board staff evaluates the severity of adverse environmental impacts on a project-by-project basis.

16. The Regional Board recognizes that maintenance activities are required in modified channels in order to ensure continued flood protection and vector control. The Regional Board has authorized such activities through the issuance of Section 401 certifications in the past and would expect to continue to authorize such activities. The Regional Board also recognizes that maintenance activities may need to be carried out on an emergency basis due to various exigencies, including brush fires and flooding. The Board through the issuance of Section 401 certifications has also authorized these emergency maintenance activities. Nothing in this resolution is intended to alter the ability of these local agencies to continue ongoing maintenance activities.

17. The Regional Board also recognizes the value of the spreading grounds that have been constructed along many of the Region's larger water courses. These spreading grounds serve a valuable function by recharging storm water into the Region's groundwater to bolster local water supplies. Nothing in this resolution is intended to alter the ability of local and regional agencies to conserve stormwater within existing regulations with the goal of increasing local water supplies.

18. The Regional Board and local agencies have undertaken or sponsored hydromodification field assessments and studies to develop peak flow design criteria to minimize or eliminate adverse impacts from urbanization for water courses in the counties of Ventura and Los Angeles. These studies include the 'Urbanization and Channel Stability Assessment in the Arroyo Simi Watershed of Ventura County, CA' (2004), and the 'Peak Impact Discharge Study' sponsored by the County of Los Angeles, which is in progress. The results from these studies will be used to develop objective criteria to reduce or eliminate the adverse impacts of hydromodification in the Los Angeles Region from new development and redevelopment.

19. Though the Regional Board does not have authority to regulate land use, the Regional Board strongly encourages land use planning agencies and developers to carefully consider, early in the development planning process, the potential impacts on water quality and beneficial uses of hydromodification projects proposed as part of new development. The Regional Board strongly discourages direct hydromodification of water courses except in limited circumstances where avoidance or other natural alternatives are not feasible. In these limited circumstances, project proponents must clearly demonstrate that a range of alternatives, including avoidance of impacts, has been thoroughly considered, hydromodification has been minimized to the extent practicable, and adequate in situ and/or off site mitigation measures have been incorporated to offset related impacts. Project proponents must also document that there will be no adverse effects to water quality or beneficial uses. This approach is consistent with the California Environmental Quality Act (CEQA), federal regulations and State and federal antidegradation policies.

20. Chapter 4 of the Basin Plan, "Strategic Planning and Implementation", outlines the suite of regulatory tools available to the Regional Board to maintain and enhance water quality. One of these tools is the 401 Certification Program. This federally required program regulates

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most hydromodification projects to ensure that the projects will not violate State water quality standards of which beneficial uses are an essential component. Section 401 Certifications may include conditions to minimize impacts from hydromodification activities by implementing Best Management Practices such as working in the dry season or out of the water, among many others. Certifications may also include monitoring requirements in order to ensure that the project is completed as specified and any proposed mitigation is successful.

21. Under section 401 of the Clean Water Act, the State Water Resources Control Board and the Regional Boards have a time limit as prescribed by applicable laws and regulations, from the receipt of a complete application, to certify that a project will comply with applicable state water quality standards prior to issuance of a federal 404 dredge and fill permit for any activity that may result in a discharge to a surface water of the United States. In the event that a project will not comply with applicable water quality standards, even with all conditions proposed, then the certification may be denied. (Cal. Code Regs., tit. 23, § 3837, subd. (b).)

22. Under section 402 (p) of the federal Clean Water Act, the State Water Resources Control Board and the Regional Boards are required to issue storm water permits to owners and operators of municipal separate storm sewer systems (MS4s). On a permit-by-permit basis, MS4 permits may identify storm water-related problems and include provisions requiring municipalities to implement measures to reduce adverse impacts of hydromodification, primarily increased flows, on beneficial uses.

23. Under separate authority granted by State law (see Article 4 (commencing with section 13260) of Chapter 4 of the Porter-Cologne Act), a Regional Board may regulate discharges of dredge or fill materials as necessary to protect water quality and the beneficial uses of waters of the State by issuing or waiving waste discharge requirements, a type of State discharge permit. For projects that may result in a discharge to a surface water of the U.S., waste discharge requirements may be issued in addition to the 401 certification. (Cal. Code Regs., tit. 23, § 3857.) Issuance of waste discharge requirements may be the only option for the Regional Board in situations where the proposed discharge is to waters of the state (e.g. isolated waters, vernal pools, etc.) rather than waters of the U.S., or in situations where the federal agency does not claim jurisdiction. All discharges of waste, including dredged and fill material, to waters of the State are privileges and not rights.

24. With certain exceptions, the California Environmental Quality Act (CEQA) requires the preparation of environmental documents for all projects requiring certifications by the state or state-law-only waste discharge requirements from the Regional Board. Hydromodification activities discussed above that require certification under section 401 of the Clean Water Act or that require waste discharge requirements for dredging and filling of State waters may be subject to CEQA. For projects that may have a significant effect on the environment that cannot be mitigated, an environmental impact report must be prepared that requires consideration of feasible alternatives to the project. (Pub. Resources Code, § 21061.)

THEREFORE, be it resolved that

1. Maintaining and restoring, where feasible, the physical, chemical and biological integrity of the Region's watercourses is one of the Regional Board's highest priorities.

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This resolution reiterates existing law and regulatory requirements and current staff practices. As such, it has no regulatory effect. However, the Regional Board directs staff to undertake a two-step process to evaluate and consider further action to control adverse impacts from hydromodification. During this process, staff is directed to involve stakeholders and regulatory agencies with jurisdiction, consistent with the requirements of the Porter-Cologne Water Quality Control Act. The first step shall be an evaluation process and shall address, at a minimum, the following:

- Prioritization for control of those hydromodification activities that cause the greatest adverse effects on water quality and beneficial uses;
- Evaluation of existing regulation of hydromodification as defined herein;
- Consideration, in light of the existing regulatory scheme, of issues affecting the Board's ability to achieve its identified objectives;
- Consideration of existing legal authorities for Board actions;
- Consideration of staff resources; and
- Evaluation and identification of the best regulatory means available to the Board and the other agencies with jurisdiction to fulfill Board objectives.

The second step shall involve, as necessary based on the above evaluation, proposals for Board consideration of actions, including without limitation educational campaigns, memoranda of understanding with other regulatory agencies, adoption of new guidance, additional municipal stormwater permit requirements or further Basin Plan amendments as necessary to address gaps in existing hydromodification control in order to maximize the Regional Board's authority to ensure that a hydromodification project does not adversely affect water quality or degrade beneficial uses of those waters.

2. Given the priority set forth in paragraph 1, the Regional Board reaffirms that the Executive Officer will only issue a certification pursuant to Clean Water Act section 401 with adequate documentation (i) that the project will comply with applicable water quality standards, including antidegradation policies, and (ii) if necessary, that adequate analysis of a range of alternatives has been performed consistent with federal regulations, the California Environmental Quality Act, and antidegradation requirements.

3. Furthermore, given the significant potential adverse impact of large-scale or multiple hydromodification projects, the Regional Board reaffirms that the Executive Officer may at his discretion choose to bring a proposed project before the Board for direction prior to certification or recommend waste discharge requirements for the proposed project, which would be subject to Board approval.

4. Given the priority set forth in paragraph 1, the Regional Board reaffirms that it will only issue waste discharge requirements with adequate documentation (i) that the WDR will implement any relevant water quality control plan, including the water quality standards contained therein, and (ii) that adequate analysis of a range of alternatives, where an alternatives analysis is required, has been performed consistent with the Porter-Cologne Water Quality Control Act, CEQA and antidegradation requirements.

5. Following completion of the two-step evaluation process described in 2 above, the Regional Board directs staff to develop, if necessary based on the conclusions of the evaluation, new policy or additional regulatory or non-regulatory tools to control adverse impacts from hydromodification, which may include educational campaigns, memoranda of understanding,

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- The findings of the study "Urbanization and Channel Stability Assessment in the Arroyo Simi Watershed of Ventura County, CA – Final Report" (2004) completed by the Ventura County Watershed Protection District, in order to satisfy a requirement of the Ventura County Municipal Storm Water Permit (Regional Board Order No. 00-108), which calls for the development of criteria to prevent or minimize erosion of natural channels and banks caused by urbanization and protect stream habitat; and
- Additional data collected or initiated by municipalities, dischargers and developers on stream stability for study sites in Los Angeles and Ventura Counties to reduce statistical uncertainty and/or improve model predictability when establishing stream stability protective criteria.

7. If a Basin Plan amendment is deemed necessary, staff is directed to consult with affected state and local agencies prior to formulating the draft amendment(s).

8. During the evaluation process, staff is directed to seek input from:

- the Department of Fish and Game and the U.S. Army Corps of Engineers, the United States Fish and Wildlife Service and other agencies with jurisdiction over hydromodification projects to ensure that any future policies and requirements to be proposed do not conflict with the jurisdiction and regulatory authority of these agencies; and
- stakeholders, including flood control agencies, agricultural interests, the building and construction industry, and environmental groups.

9. Pursuant to section 13224 and 13225 of the California Water Code, the Regional Board, after considering the entire record, including oral testimony at the hearing, hereby adopts the Resolution.

I, Jonathan Bishop, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of a resolution adopted by the California Regional Water Quality Control Board, Los Angeles Region, on January 27, 2005.

ORIGINAL SIGNED BY — *2/23/05*

Jonathan S. Bishop, P.E.
Executive Officer

Date

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D24. Letter from the Santa Clarita Organization for Planning and the Environment, dated February 16, 2007

Response 1

The comment expresses the opinions of the Santa Clarita Organization for Planning and the Environment (SCOPE). The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not address or question the content of the Draft EIR, no further response is required.

Response 2

This comment is an introduction to comments that follow. For responsive information, please see **Responses 3** through **27**, below.

Response 3

The comment requests an extension of time for commenting on the Draft EIR. Additional time was provided. For additional information responsive to the comment, please refer to **Topical Response 3**: Public Review Opportunities. The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not raise an environmental issue, no further response is required.

Response 4

The comment states that the Draft EIR fails to comply with the Los Angeles County Development Monitoring System (DMS). This statement is incorrect. The Landmark Village Draft EIR, Section 3.0, Cumulative Impact Analysis Methodology, describes the two cumulative analyses utilized in the Draft EIR.

Consistent with DMS, and as applied to fire protection services, the Landmark Village project will provide one fire station to be built west of Long Canyon Road. An agreement between Newhall and the County's Fire Department includes dedication of the land for the fire station, and construction of the fire station. In addition, the Newhall Ranch Specific Plan includes the construction of two other equipped and furnished fire stations, and such stations will be conveyed to the Fire District *in lieu* of developer fees.

As to education, the Landmark Village site includes a 9-acre Castaic School District elementary school site to be constructed in the central portion of the tract map site. The school would consist of a main school building with modular classrooms, an adjacent playing field, and on-site parking. In addition, the

Newhall Ranch Specific Plan calls for reservation of up to four other elementary school sites, one junior high school site, and one high school site. The developer of future subdivisions within the Specific Plan also must comply with the terms and conditions of the School Facilities Funding Agreements between The Newhall Land and Farming Company and the Newhall School District, the William S. Hart Union High School District, and the Castaic Union School District. These agreements are intended to fully mitigate the Specific Plan's impacts on school facilities.

As to libraries, consistent with the Newhall Ranch Specific Plan Program EIR, funding to the County Librarian is required for a maximum of two libraries (including the sites, construction, furniture, fixtures, equipment, and materials). (Please see the Landmark Village Draft EIR, Section 4.17, Library Services, Mitigation Measure SP 4.9-1, p. 4.17-10–4.17-11.)

As to water service, the Landmark Village project is relying upon local groundwater supplies to meet the project's potable water demands, and recycled water from the Newhall Ranch WRP to meet the project's non-potable water demands. The project does not rely on CLWA's SWP supplies; and, therefore, does not result in or contribute to any significant cumulative impacts on Santa Clarita Valley's water supplies.

In short, the applicant has fully complied with the County's DMS provisions.

Response 5

The comment states that Sheriff services should be a part of DMS. The comment is noted. However, the County did not determine that Sheriff services should be a part of DMS when the General Plan was adopted. The comment is also beyond the scope of this project-level EIR. It should be noted that the applicant is dedicating land and constructing a Sheriff's station in conjunction with the implementation of Newhall Ranch. Nonetheless, the comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not address or question the content of the Draft EIR, no further response is required.

Response 6

The comment reiterates the purpose of DMS analysis. The comment restates information contained in the Landmark Village Draft EIR, Section 3.0, pp. 3.0-2 through 3.0-3, but does not raise an environmental issue within the meaning of CEQA. The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not raise an environmental issue regarding the content of the Draft EIR, no further response is required.

Response 7

The comment raises issues that do not relate to any physical effect on the environment. The comment also does not raise any issue regarding the Landmark Village project or the associated EIR. Nonetheless, the comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not raise an environmental issue, no further response is required.

Response 8

The comment restates information already contained in the Landmark Village Draft EIR, Section 3.0, but does not raise an environmental issue within the meaning of CEQA. The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not raise an environmental issue regarding the content of the Draft EIR, no further response is required.

Response 9

The comment states that DMS printouts do not state the level of service needed for pending, existing, and approved projects. As a matter of record, the DMS printouts have never stated the level of service needed, nor is that a requirement of the County's DMS. Information concerning the capacity and status of various services (e.g., school, fire, wastewater, library, etc.) are addressed in each respective section of the Landmark Village Draft EIR (see, e.g., Section 4.15, Education; Section 4.14, Fire Protection; Section 4.11, Wastewater Disposal; Section 4.17, Libraries).

Response 10

The comment states that the DMS printout does not include sewage plant capacity. Please see **Response 9**, above. In addition, information with regard to capacity and status of wastewater treatment plant expansions is secured through written communication from each service provider, and reported in the Landmark Village Draft EIR, Section 4.11, Wastewater Disposal.

Response 11

The comment states that the DMS printout does not indicate the additional load that is required by the proposed project and without this information decision makers cannot adequately assess the level of service required. Each EIR section (e.g., utility or public services [e.g., wastewater]) provides existing capacity information obtained by the service provider and DMS – in this example, the capacity of the wastewater treatment plants is provided in the Draft EIR, Section 4.11, Wastewater Disposal. This section

quantifies how much wastewater would be generated and determines if there is enough capacity to serve the proposed project. Cumulative impacts are addressed in the same manner. DMS was never intended to provide analysis information. It is the responsibility of the EIR to utilize the base data provided by DMS and apply the data to the proposed project.

Response 12

The comment states that there is no evaluation of fire and school services. This is incorrect. Please see the Landmark Village Draft EIR, Section 4.14, Fire Service, and Section 4.15, Education, which conclude that, with mitigation and previously established agreements, fire and education services would be less than significant.

Response 13

The Landmark Village Draft EIR addresses library, water, and wastewater, and includes a DMS analysis in Sections 4.17, 4.10, and 4.11, respectively.

Response 14

The comment states that traffic has not been analyzed under the DMS system. The comment is not correct. As stated in Landmark Village Draft EIR, Section 3.0, Cumulative Analysis Methodology, p. 3.0-4, traffic projects must meet criteria and implement one or more of the mitigation measures identified: Traffic Study, Joint City/County Bridge/Thoroughfare District, General Plan Mitigation, Conditions of Approval, and Building and Improvement Permits. The Landmark Village Draft EIR, Section 4.7, Traffic/Access, addresses all of the above noted points. No further response is required.

Response 15

The referenced information appears to be from other County projects indicating supply and demand data from approximately 15 years ago. The DMS spreadsheets, in use at this time, are generated by the County of Los Angeles and are included in Appendix 3.0 of the Landmark Village Draft EIR.

Response 16

The comment states that the disclosure of existing units does not constitute DMS analysis. Please see the Landmark Village Draft EIR, Sections 4.7, Traffic/Access; 4.10, Water Service; 4.11; Wastewater Disposal; 4.15, Education; 4.17, Library Services; 4.14, Fire Protection; which analyze existing conditions to the proposed project and cumulative growth under the DMS Build-Out Scenario.

Response 17

As a preface to the response to this comment, it should be noted that the SCOPE was one of the entities that settled and dismissed its appeal in connection with the prior Newhall Ranch litigation (*United Water Conservation District, et al. v. County of Los Angeles, et al.*, Case No. 239324-RDR [Consolidated with Case Nos. 239325, 239326 and 239327-RDR] 5th Civil No. F044638).[28] In this litigation, SCOPE and other entities had appealed the order granting a motion brought by the County of Los Angeles and The Newhall Land and Farming Company to discharge the writ of mandate that was previously entered by the trial court. The motion was granted discharging the prior writ, because the Newhall Ranch additional environmental analysis was found to have complied with CEQA.

As part of the settlement effective March 29, 2004, SCOPE and other entities acknowledged that the Newhall Ranch Revised Additional Analysis (Volume VIII; May 2003) had disclosed the actual amount of groundwater pumped from the basin to irrigate Newhall's agricultural lands in Los Angeles County. SCOPE and other entities also acknowledged that a total of 7,038 acre-feet per year was determined to be the average amount of water used on Newhall's agricultural lands in Los Angeles County from 1996-2000. Further, SCOPE and other entities acknowledged that: (a) groundwater historically and presently used for crop irrigation on the Newhall Ranch Specific Plan site and elsewhere in Los Angeles County would be made available by Newhall, or its assignee, to partially meet the potable water demands of the Newhall Ranch Specific Plan; (b) the amount of groundwater pumped for this purpose would not exceed 7,038 acre-feet per year; and (c) pumping this amount would not result in a net increase in groundwater use in the Santa Clarita Valley. The terms of the settlement also required Newhall to monitor, report, and verify its groundwater usage and to provide on-going groundwater-related documentation.

Based upon this settlement, the pending appeal was dismissed, resulting in final resolution of all litigation over the adequacy of the certified Newhall Ranch Specific Plan Program EIR and its water supplies. As a result of this settlement, it is inappropriate for SCOPE to reargue prior comments and claims concerning the Specific Plan's use of local groundwater to meet its potable water supplies. Nonetheless, the County further responds to SCOPE's additional comments below.

The comment states that there is a lack of DMS reporting and water availability. It also states that the EIR "erroneously" provides that the Landmark Village project will be served "from Valencia's 'agricultural water' that it 'owns'." First, as to DMS reporting of water, please see the Draft EIR, Section 4.10, Water Service, pp. 4.10-79 through 4.10-82. In addition, the reporting of the water demand and supply for the

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28 The "Notice of Settlement and Dismissal of Appeal" was filed April 1, 2004, is incorporated by this reference, and is available for public inspection and review upon request at Impact Sciences, Inc., 803 Camarillo Springs Road, Suite A-1, Camarillo, California 93012.

proposed project and other cumulative development in the Santa Clarita Valley, is provided in the Draft EIR, Appendix 4.10, SB610 Water Supply Assessment and 2005 Urban Water Management Plan. In addition, the Final EIR, **Appendix B**, includes the latest 2006 Santa Clarita Valley Water Report (May 2007), which provides relevant reporting of water supply and demand for the Santa Clarita Valley.

Second, the comment incorrectly states that the agricultural groundwater supplies are from Valencia Water Company. As stated in the Draft EIR, Section 4.10, Water Service, p. 4.10-2, "[t]he applicant would meet all of the Landmark Village project's water demands by using *its* groundwater produced from the Alluvial aquifer in Los Angeles County (County), which is presently committed to agricultural uses." Here, the applicant is The Newhall Land and Farming Company, or its designee, not the Valencia Water Company. The groundwater supplies are those supplies "historically and presently" available to the applicant, as the overlying landowner, from the Alluvial aquifer. The amount of groundwater historically and presently available to the applicant from that source is approximately 7,038 acre-feet per year (afy). The project's potable water demand is estimated at 702 afy. Therefore, as reported in the Draft EIR, pp. 4.10-2 through 4.10-3, the water from the Alluvial aquifer "historically and presently" used for agriculture by the applicant would be used to meet all of the project's potable water needs resulting in no net increase in groundwater use. For further information responsive to this comment, please see **Response 8** to letter from California Water Impact Network, dated February 11, 2007.

Response 18

The comment restates information contained in the Landmark Village Draft EIR, Section 4.13, Sheriff Services, but does not raise an environmental issue within the meaning of CEQA. The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not raise an environmental issue regarding the content of the Draft EIR, no further response is required.

Response 19

The comment states that the EIR provides that only four deputies would be required. This comment is incorrect. The Landmark Village Draft EIR, Section 4.13, Sheriff Services, p. 4.13-11, states that: "Therefore, for purposes of this analysis, it is assumed that the proposed project would require an additional 15 deputies."

Response 20

The comment states that Sheriff estimates of the need for additional personnel is based on 2004 population and traffic conditions and that these projections are no longer valid. The Sheriff's Department

based its projected needs upon the project description found in the Landmark Village Draft EIR, Section 1.0, Project Description. The proposed project is not responsible for the impacts generated by existing or other proposed projects in the Santa Clarita Valley. In addition, the Draft EIR, Section 4.13, contains an adequate analysis of Sheriff services relative to the proposed project and cumulative development in the Valley.

Response 21

The comment expresses SCOPE's opinion that Sheriff services should be evaluated under DMS. Sheriff services are not identified as one of the environmental issues required to be addressed in the County's DMS (see, Draft EIR, Section 3.0, p. 3.0-2). Nonetheless, the comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not address or question the content of the Draft EIR, no further response is required.

Response 22

The project applicant has agreed to provide a minimum 5-acre site to construct a sheriff station on the Newhall Ranch Specific Plan site. As a part of this agreement, the project applicant will contribute a pro-rata share portion of the costs for and will construct a facility on the 5-acre property.

Additionally, the fiscal impact analysis prepared for the Newhall Land's communities west of Interstate 5 including the Newhall Ranch Specific Plan indicated that at build-out there would be a surplus of $42 million in tax revenue generated on an annual basis. It should be noted that this surplus is in addition to the operating costs associated with these communities. The Specific Plan's fiscal analysis is incorporated by this reference, and is available for public review and inspection, along with the Newhall Ranch Specific Plan Program EIR, which has been previously incorporated hereto.

Response 23

The comment raises economic, social, or political issues that do not appear to relate to any physical effect on the environment. Nonetheless, for responsive information, please see the Landmark Village Draft EIR, Section 4.15, Education. The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not raise an environmental issue, no further response is required.

Response 24

The comment states that the Landmark Village Draft EIR is "incomplete" because the County has not required or did not require the project applicant to supply "both" a SB610 Water Supply Assessment and a SB221 Water Verification. At this stage of the project approval process, the law does not require *both* a SB610 Water Supply Assessment *and* a SB 221 Water Verification. Instead, the law requires that an EIR include a water supply assessment, and the Landmark Village Draft EIR includes the required assessment. Please see Draft EIR, Appendix 4.10, SB610 Water Supply Assessment.

Response 25

Please see **Response 24**, above.

Response 26

The comment raises an issue that is beyond the scope of the Landmark Village Draft EIR, and does not raise an environmental issue within the meaning of CEQA. Nonetheless, it is the County's understanding that the California Public Utilities Commission has not been presented with a request from Valencia Water Company to expand its service area; and, therefore, the quote taken from Decision D0111048, dated November 30, 2001, is not applicable. The comment also does not provide the referenced decision, making it difficult for the County and other interested parties to place the quoted text in proper context.

Response 27

Please see **Responses 24** and **26**, above.

Response 28

The comment claims that the Landmark Village Draft EIR does not comply with the requirements of the recent California Supreme Court decision, *Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho Cordova* (2007) 40 Cal.4th 412. The *Vineyard* decision is thoroughly addressed in the Final EIR, **Topical Response 5**: Litigation Concerning Water Supplies.

Response 29

The comment states that the "indicated pumping from the Saugus Aquifer cannot be accomplished without the return to service of the wells that are currently closed due to ammonium perchlorate pollution." On the contrary, the Landmark Village Draft EIR, Section 4.10, Water Service (pp. 4.10-2–4.10-3, 4.10-6, 4.10-20–4.10-33, and 4.10-60–4.10-72), has found that the potable water needed to serve Landmark Village is available and reliable, that the Santa Clarita Valley water purveyors' groundwater

operating plan can be met by the local groundwater basin without any adverse environmental consequences, and the capacity from both the Alluvial aquifer and the Saugus Formation is adequate and sustainable.

Response 30

Please see **Topical Response 1**: Perchlorate Treatment Update.

Response 31

Please see **Topical Response 1**: Perchlorate Treatment Update.

Response 32

For information responsive to this comment, please see the Landmark Village Draft EIR, Section 4.10, Water Service, pp. 4.10-33 through 4.10-42, and 4.10-63 through 4.10-69. In addition, please see **Topical Response 1**: Perchlorate Treatment Update.

Response 33

For updated information regarding perchlorate and impacted wells, please see **Topical Response 1**: Perchlorate Treatment Update.

Response 34

The comment requests that the water purveyors use a different methodology for assessing pumping capacity of wells. The County has considered this request, and believes it is more desirable to rely upon the expertise of the Santa Clarita Valley water purveyors in assessing water well pump capacity.

Response 35

For responsive information, please see the Landmark Village Draft EIR, Section 4.10, Water Service, pp. 4.10-44 through 4.10-56; **Topical Response 4**: CLWA's 41,000 AFY Water Transfer; and **Topical Response 5**: Litigation Concerning Water Supplies.

Response 36

Please see **Response 35**, above.

Response 37

The requested information is not required to be included in an EIR, and does not affect the validity of the Landmark Village Draft EIR or raise an environmental issue within the meaning of CEQA. Nonetheless, the requested information can be easily obtained by contacting the project applicant.

Response 38

The comment refers to "several other conditions" placed on the Landmark Village tract map approval that should be "disclosed and discussed in the EIR." However, the comment does not specify those other conditions, and does not provide any supporting documents describing these "several other conditions." Without further information, no further response is possible or required.

Response 39

The Landmark Village project's non-potable water demand will be met through the use of recycled water from the Newhall Ranch Water Reclamation Plant (WRP) or the existing Valencia WRP. Please see, e.g., Draft EIR, Section 4.10, Water Service, p. 4.10-2.

Response 40

Please see **Response 2**, to letter from California Regional Water Quality Control Board, Los Angeles Region, dated January 22, 2007.

Response 41

Please see **Topical Response 3**: EIS/EIR Project**.**

Response 42

Please see **Responses 5**, **8**, and **9** to letter from California Regional Water Quality Control Board, Los Angeles Region, dated January 22, 2007.

Response 43

The comment states that the Regional Water Quality Control Board will need to subsequently issue a Section 401 certification in connection with the Landmark Village project; however, the certification is not currently a County issue. Also, the comment states that the project should consider eliminating or reducing downstream bank stabilization and eliminating the Long Canyon Road Bridge. First, both the bank stabilization and the Long Canyon Road Bridge constitute infrastructure previously considered and approved by the County's Board of Supervisors as part of its approval of the entire Specific Plan and

associated EIR. Second, the Landmark Village Draft EIR includes the CEQA-required "no project" alternative for consideration by the County. Under this alternative, downstream bank stabilization and the Long Canyon Road Bridge would not be installed/constructed. No further information is required in response to this general comment.

Response 44

The comment addresses general subject areas, which received extensive analysis in the Landmark Village Draft EIR, Section 4.1, Geotechnical and Soil Resources. The comment does not raise any specific issue regarding that analysis and, therefore, no more specific response can be provided or is required. However, the comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project.

Response 45

The comment states that the amount of fill proposed will prove to be unsafe, especially in liquefaction areas. The comment provides no support for this opinion, and the Landmark Village Draft EIR, Section 4.1, Geotechnical and Soil Resources, does not concur.

The Landmark Village Draft EIR, Section 4.1, Geotechnical and Soil Resources, addresses all potential significant geologic, soil, and geotechnical impacts, and adopts an extensive mitigation program associated with all such potential impacts (see, Draft EIR, pp. 4.1-28–4.1-50). With implementation of the mitigation measures recommended in the Draft EIR, no significant unavoidable project-related or cumulative geologic, soil, or geotechnical impacts are anticipated in connection with the proposed project.

Nonetheless, the comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not address or question the content of the Draft EIR, no further response is required.

Response 46

The comment expresses SCOPE's opinion, but does not provide any supporting data and, importantly, the opinion does not apply to the proposed project. Nonetheless, the comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not address or question the content of the Draft EIR, no further response is required.

Response 47

The comment addresses claims concerning the stability of soils underneath purchased home lots, but provides no documentation or other data to support the claim. There are no "defects" in the soils associated with the proposed project site. In addition, the Landmark Village Draft EIR, Section 4.1, Geotechnical and Soil Resources, addresses all potential significant geologic, soil, and geotechnical impacts, and adopts an extensive mitigation program associated with all such potential impacts (see, Draft EIR, pp. 4.1-28 through 4.1-50). With implementation of the mitigation measures recommended in the Draft EIR, no significant unavoidable project-related or cumulative geologic, soil, or geotechnical impacts are anticipated in connection with the proposed project.

Response 48

The comment would like to see project impacts reduced through greater avoidance. The comment suggests that greater avoidance could be achieved by eliminating the downstream bank stabilization and the Long Canyon Road Bridge. The comment also would like the project footprint lessened to avoid impacting oak trees.

In response to comments concerning downstream bank stabilization and the related bridge crossing, the Landmark Village Draft EIR addresses such concerns. As disclosed in the Draft EIR, Section 4.2, Hydrology, at p. 4.2-35, buried bank protection along portions of the Santa Clara River (see, Draft EIR, Figure 1.0-23) is needed to protect the residential and commercial development on the Landmark Village project site, the Long Canyon Road Bridge, and the property immediately downstream of the Landmark Village site from potential localized erosion due to project implementation. Thus, it is deemed both appropriate and desirable to install infrastructure (i.e., bridge, bank protection) in conjunction with the grading and construction associated with the Landmark Village tract map site. The Draft EIR, Section 4.2, p. 4.2-42, disclosed that localized increases in velocity in excess of 4 feet per second (fps) would occur downstream of the Landmark Village project site and that such localized increases in velocity have the potential to cause erosion. The project-related increases in velocity downstream of the project site would be mitigated by installation of buried bank stabilization/protection along the southern edge of the river corridor at the Long Canyon Road Bridge and extending both east and west (see, Draft EIR, Figure 1.0-23). The biological and aquatic impacts associated with that bank stabilization were previously analyzed and accepted by the County in the certified Newhall Ranch Program EIR. Such impacts are further analyzed at the Landmark Village tract map level as part of this EIR. (Please see, specifically, Section 4.2, Hydrology, revised **Section 4.4, Biota**, and Section 4.5, Floodplain Modifications.) In addition, the Draft EIR, Section 5.0, Project Alternatives, includes the CEQA-required "No Project" alternative, which would

eliminate construction of both the Long Canyon Road Bridge and all bank stabilization, including the bank stabilization downstream of the project site.

Second, the Draft EIR provides extensive analysis of oak tree impacts. Please see Final EIR, revised **Section 4.4, Biota**, and **Appendix A** (Oak Tree Survey).

Response 49

Please see Final EIR, **Appendix A**, Biota, Oak Tree Survey, Preserved and Relocated Oaks, prepared by Richard Johnson & Associates, 2003. This survey conducted an analysis of previously preserved and relocated oaks to determine their condition (health) after the relocation for seven projects developed by the project applicant. In many cases the relocated trees had a better condition when compared to their initial site orientation. In no instance did the condition of the tree deteriorate after relocation.

Response 50

The comment provides background information, but does not raise an environmental issue within the meaning of CEQA. The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not raise an environmental issue regarding the content of the Draft EIR, no further response is required.

Response 51

Please see **Response 4** to letter from Heal the Bay, dated January 22, 2007.

Response 52

The comment states the mitigation measures will not reduce impacts to less than significant. The comment expresses SCOPE's opinions, but does not raise an issue with respect to the adequacy or content of the Draft EIR. Nonetheless, the comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not address or question the content of the Draft EIR, no further response is required.

Response 53

The acreage of the fuel modification zone was included in the calculations of impacts to on-site biological resources as part of the development footprint. Even so, most of the fuel modification zone for the Landmark Village project occurs within agricultural areas and will not result in additional impacts to native vegetation. The Landmark Village Final EIR, **Appendix A**, includes a preliminary fire management plan that is responsive to this comment.

Response 54

The comment refers to the Landmark Village Draft EIR, Section 1.0, Project Description. The comment also states that the bank protection should be removed from the project description.

As stated in the Draft EIR, Section 1.0, p. 1.0-48, as part of the project approvals for the Newhall Ranch Specific Plan, the County approved program-level CUP No. 94-087-(5) on May 27, 2003. The CUP approved three elevated highway bridge crossings over the Santa Clara River, including the general alignment for the Long Canyon Road Bridge. Each bridge crossing is an extension of an existing road, creating a functional regional circulation system for Newhall Ranch, including Landmark Village, the first phase of the Newhall Ranch community. The location of the Long Canyon Road Bridge and associated bank protection is shown in Figure 1.0-23 of the Draft EIR, Section 1.0, Project Description.

The elevated Long Canyon Road Bridge crosses the Santa Clara River and will serve as a portion of the circulation system for other portions of Newhall Ranch. These other portions are not "future unapproved phases of Newhall Ranch." Commencing in 1994, and concluding in May 2003, the County embarked upon the preparation of a comprehensive Specific Plan for the entire Newhall Ranch. The Specific Plan was one of several project approvals covering the entire Newhall Ranch area. The environmental implications of the Specific Plan and associated project approvals were addressed in a comprehensive program EIR (see, Newhall Ranch Specific Plan Program EIR). Both the Specific Plan and associated Program EIR were approved by the County's Board of Supervisors on May 27, 2003. Thus, the entire Land Use Plan for Newhall Ranch has been studied, debated, and approved as of May 2003. Nothing precludes the applicant from implementing various components of the approved Specific Plan, including the Landmark Village project and associated infrastructure, such as the Long Canyon Road Bridge and buried bank stabilization.

In addition, as disclosed in the Draft EIR, Section 4.2, Hydrology, at p. 4.2-35, buried bank protection along portions of the Santa Clara River (see, Draft EIR, Figure 1.0-23) is needed to protect the residential and commercial development on the Landmark Village project site, the Long Canyon Road Bridge, and the property immediately downstream of the Landmark Village site from potential localized erosion due to project implementation. Thus, it is deemed both appropriate and desirable to install infrastructure (i.e., bridge, bank protection) in conjunction with the grading and construction associated with the Landmark Village tract map site. The Draft EIR, Section 4.2, p. 4.2-42, disclosed that localized increases in velocity in excess of 4 fps would occur downstream of the Landmark Village project site and that such localized increases in velocity have the potential to cause erosion. The project-related increases in velocity downstream of the project site would be mitigated by installation of buried bank stabilization/protection along the southern edge of the river corridor at the Long Canyon Road Bridge and extending both east

and west (see, Draft EIR, Figure 1.0-23). The biological and aquatic impacts associated with that bank stabilization were previously analyzed and accepted by the County in the certified Newhall Ranch Program EIR. Such impacts are further analyzed at the Landmark Village tract map level as part of this EIR. (Please see, specifically, Section 4.2, Hydrology, revised **Section 4.4, Biota**, and Section 4.5, Floodplain Modifications.)

Response 55

The comment refers to the Landmark Village project's buried bank protection starting at the Long Canyon Road Bridge and extending westerly downstream of the tract map site. The comment correctly states the Draft EIR's disclosure that downstream buried bank protection is needed to mitigate potential localized erosion impacts associated with implementation of the project. However, the comment states, in effect, that too much bank protection is provided. For responsive information, please refer to **Response 54**, above. In addition, in the County's view, the buried bank protection can serve as both a project component and a form of mitigation to reduce or minimize the potential for localized erosion. And, nothing in CEQA precludes the buried bank protection from being included as a component of the project (i.e., a project design feature) and a form of mitigation to minimize the potential for localized erosion in large storm events – particularly where, as here, the entire Specific Plan was the subject of a previously certified programmatic environmental document that included the Newhall Ranch land plan and associated infrastructure (e.g., tract maps, bridges, bank protection, etc.).

Response 56

The comment requests that alternatives be considered that drop the downstream bank stabilization and Long Canyon Road Bridge from the proposed project. In response, the Landmark Village Draft EIR summarized the alternatives previously evaluated in the Newhall Ranch Specific Plan Program EIR. This previous analysis included alternatives that proposed no project-related development on the Newhall Ranch site. In addition, the Landmark Village Draft EIR, Section 5.0, Project Alternatives, includes the CEQA-required "No Project" alternative. This alternative compares the impacts that may occur if the site were left in its present condition, without development of the proposed Landmark Village project.

Response 57

Please see **Responses 54** through **56**, above.

Response 58

Please see **Topical Response 2**: EIS/EIR Project.

Response 59

The comment indicates that SCOPE does not support the expansion of the Chiquita Canyon Landfill, citing impacts to nearby residents. Also, the comment states that if all communities were to comply with AB 939, expansion to Chiquita Canyon Landfill would be alleviated. The comment raises economic, social, or political issues that do not appear to relate to any physical effect on the environment identified in the Landmark Village Draft EIR. Nonetheless, the comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not raise an environmental issue, no further response is required.

Response 60

The comment requests that if the Chiquita Canyon Landfill expansion is approved, that Landmark Village residents be notified in real estate agreements in 14-pt type of the intention to expand. The comment raises economic, social, or political issues that do not appear to relate to any physical effect on the environment identified in the Landmark Village Draft EIR. Nonetheless, the comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not raise an environmental issue, no further response is required.

Response 61

The comment suggested that parkland be dedicated as mitigation for the Chiquita Canyon Landfill expansion. The comment suggested that portions of the floodplain or SEA currently slated for development might be considered. The Chiquita Canyon Landfill expansion is not a part of the proposed project nor is it a part of the Newhall Ranch Specific Plan. No mitigation on the part of the proposed project or the Newhall Ranch Specific Plan as a result of landfill expansion is required.

Response 62

Traffic volume forecasts for the I-5 freeway shown in the Draft EIR traffic study indicate deficient conditions will occur within the Santa Clarita Valley without the planned freeway improvements identified in the current Caltrans planning documents. The project applicant has committed to participate in capacity augmentation improvements on a fair-share basis for the I-5 freeway (reference Mitigation Measure LV-4.7-21). The Draft EIR, Section 4.7, Traffic/Access, also identifies existing traffic conditions, traffic-related potential significant impacts, and mitigation from both the Specific Plan and proposed Landmark Village project.

Response 63

Right-of-way for a potential future rail use has been set aside within the project boundary.

Response 64

The comment contends that the project would build in future light rail right-of-way and then need to be demolished in the future to accommodate light rail. The comment is incorrect. The project reserves right-of-way for light rail and does not propose any construction on this reserved area.

Response 65

The comment states that condemnation proceedings would come at a great cost for the public and merchants. Please see **Responses 63** and **64**, above. Nonetheless, the comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not raise an environmental issue, no further response is required.

Response 66

The comment requests that light rail right-of-way be included in the project. Please see **Responses 63** and **64**, above. In addition, the comment incorrectly identifies the average daily trips associated with the Landmark Village project. Please see the Landmark Village Draft EIR, Section 4.7, Traffic/Access, p. 4.7-1, for a correct summary description of the estimate average daily trips generated by the proposed project through build-out.

Response 67

The comment refers generally to global warming, and incorrectly identifies the average daily trips generated by the proposed project. Please see **Response 66**, above, for information concerning the Landmark Village project's average daily trip generation. As to global warming comments, please see the following for responsive information: **Topical Response 6**: Global Climate Change And Its Effects On California Water Supplies; **Topical Response 7**: Global Climate Change And Its Effects On Sensitive Biological Resources; and **Topical Response 8**: Greenhouse Gas Emissions And Global Climate Change.

Fierros, Daniel

ENV-23

From: Charlotte Hodde [chodde@pcl.org]
Sent: Tuesday, February 20, 2007 4:42 PM
To: Fierros, Daniel
Subject: Landmark Village Public Comment Submittal
Attachments: PCL Landmark Comment Letter.pdf; PCL Landmark Village Comment Letter.doc

Dear Mr. Fierros:

Attached are the Planning and Conservation League's comments on the Draft EIR of the Newhall Ranch Landmark Village Project. A facsimile copy will follow shortly. 1

Thank you for your assistance in securing an extension of the public comment period. We appreciate your effort to keep us informed of all the deadlines of this process. 2

Sincerely,
Charlotte

Charlotte Hodde
Water Policy Specialist
Planning and Conservation League
chodde@pcl.org
916-444-4526 (x123)
916-448-1789 (fax)
www.pcl.org

2/21/2007

D25. Letter from Planning and Conservation League, dated February 20, 2007

Response 1

This comment is an introduction to comments that follow. No further response is required.

Response 2

The comment states an appreciation to the County for extending the public comment period of the Landmark Village Draft EIR. The comment is noted, and will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. Because the comment does not raise an environmental issue, no further response is required.

President
John Van de Kamp
President Emeritus
Sage Sweetwood
First Vice President
Bill Yeates
Senior Vice President
Kevin Johnson
Secretary/Treasurer
Bill Center

PLANNING AND CONSERVATION LEAGUE

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Rick Frank
Rick Hawley
Doug Linney
David Mugaverp
Lynn Sadler
Teresa Villegas

ENV-18

February 20, 2007

Mr. Daniel Fierros
Los Angeles County Regional Planning Department
320 W. Temple St.
Los Angeles, CA 90013

via facsimile to: 213-626-0434
via email to: DFierros@planning.lacounty.gov

Re: Submittal of Public Comments in response to the Draft Environmental Impact Report (DEIR) of the Newhall Ranch Landmark Village Project, prepared by Impact Sciences Inc. [County Project No. 00-196-(5)].

Dear Mr. Fierros:

The Planning and Conservation League (PCL) submits the following comments on the Draft Environmental Impact Report (EIR) for the Newhall Ranch Landmark Village Project (Project) and urges the Planning Department to withdraw the DEIR pending further review and analyses. 1

PCL is primarily concerned that the Water Supply Assessment for the Newhall Ranch Landmark Village Project is inaccurate. Specifically, the Water Supply Assessment is inconsistent with recent court decisions; it relies heavily on unverified water supplies, water projects and reports that are under legal challenge. 2

In addition, the DEIR does not accurately incorporate information regarding the impacts of climate change on the availability of water for the project. In fact, the DEIR fails to adequately analyze the proposed projects impact to global warming that would result from the release of greenhouse gases during the construction and long-term implementation of the project. We are concerned that the DEIR does not consider project alternatives that would reduce the impact of climate change on water resources. 3

As one of the largest development proposals in California history, this Environmental Impact Report will establish state wide precedent for similar sized developments in the future. We urge the Los Angeles Planning Department to ensure that decision makers and the public have access to accurate, thorough information, including information regarding the reliability of water sources, to allow for thoughtful consideration of the proposed project and reasonable project alternatives. PCL requests consideration of our comments below and strongly urges that the further consideration of the DEIR be delayed until the significant flaws in the DEIR are addressed. 4

1965-2005 40 PLANNING AND CONSERVATION LEAGUE

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Website: www.pcl.org Email: pclmail@pcl.org

California Affiliate NATIONAL WILDLIFE FEDERATION

A. Inadequacy of Water Supply Assessment:

The DEIR egregiously mischaracterizes the reliability of the 41,000 acre-feet Kern/Castaic transfer, considering that all the points addressed in PCL and CWIN's pending legal challenge in Los Angeles County Superior Court to the Castaic Lake Water Agency's new EIR (4.10-10, 4.10-14 n. 10, 53-55.) are non-final. The DEIR falsely represents the transfer as contractually complete. The Monterey Settlement Agreement, to which Castaic Lake Water Agency is a signatory, expressly excludes that transfer from its list of "final" transfers, and makes clear that this transfer is still subject to DWR's statewide programmatic review and decision in its still-forthcoming "Monterey Plus" review. This Agreement precludes reliance on the 41,000 AF transfer and on projects approved after March 26, 2001 until the new Monterey agreement EIR is completed. 5

In fact, the 1999 Castaic/Wheeler Ridge contract even expressly references the outcome of PCL v. DWR as a condition that could affect the transfer's availability. The DEIR mischaracterizes the uncertainty associated with Castaic's 2004 separate EIR for the Kern/Castaic transfer. Repeating the CEQA error identified in California Oak Foundation v. City of Santa Clarita (2005) 133 Cal. App. 4th 1219, 1236, the DEIR "turns CEQA on its head" by suggesting that the pre-ordained outcome of the process is continued use of the 41,000 AF." 6

The DEIR relies heavily on very problematic assumptions about the availability of imported State Water Project (SWP) supplies to support its conclusion that there is a substantial "surplus" of local water. (See e.g., 4.10-7.) It lists, among other sources, SWP Table A deliveries, as well as water from "flexible storage" and water stored in Semitropic and through the Rosedale-Rio Bravo program. It does not discount, or even really discuss, the prospect that water from the latter categories may be from unstable sources that cannot really support permanent development, including "interruptible" Article 21 water. The DEIR doesn't disclose enough about the source of imported water for the reader to ascertain whether any of it is reliably available. 7

Finally, to the extent that these sources rely upon the definitions and operational rules established in the Monterey Amendments, those Amendments remain non-final and subject to the outcome of DWR's still-pending "Monterey Plus" review. 8

B. Compliance with Vineyard Citizens for Responsible Growth vs. City of Rancho Cordova Judicial Definition of Water Supply Reliability

This recent California Supreme Court case *Vineyard Citizens for Responsible Growth v. City of Rancho Cordova,* Slip Op. S 132972 (February 1, 2007) held that the lead agency's EIR failed to adequately address the long-term water supply available for proposed construction, in violation of the California Environmental Quality Act. The Vineyard decision makes clear that water purveyors and land use planners must objectively and in good faith disclose the uncertainty associated with potential sources of water, and identify and evaluate alternative sources in light of such uncertainly. The Planning and Conservation League urges that the Los Angeles Planning Department not make similar assumptions about water availability; but instead, rewrite the Water 9

Supply Assessment for Landmark Village to comply with the definition of explicit water supply reliability as required by the Vineyard court decision. It is prudent for Los Angeles County to reevaluate this Water Supply Assessment now and avoid future negative impacts to Landmark residents as a result of reduced water reliability. 9

C. Absence of Climate Change Consideration in Delivery Reliability Report, Castaic Urban Water Management Plan, and this DEIR Water Supply Assessment

Last year, Department of Water Resources (DWR) came out with a report titled "Progress on Incorporating Climate Change into Management of California's Water Resources"(July 2006) that predicts that the impacts of climate change will compromise future yields of the SWP. Climate change is altering the timing and amount of rainfall in California. This expected change in hydrology is not represented in the 2005 State Delivery Reliability Report. DWR's Reliability Report fails to include demand or reliability projections under expected impacts of climate change, even though that information is available. DWR has in fact modeled reliability and demands under climate change. The California Energy Commission has also modeled water supply reliability from the SWP under climate change (see PCL comments to DWR on the December Draft 2005). **According to that information, deliveries from the SWP could be up to 1 million acre feet per year *less than* what was reported in the DWR's Draft Reliability Report.** 10 11

The DEIR currently under review derives its Water Supply Assessment directly from the Castaic Urban Water Management Plan which relies on water availability figures represented in the Delivery Reliability Report. Given that these guiding documents have not recalculated supply assurances under DWR's reported hydrologic changes (see filed letter from Mindy McIntyre to Mary Lou Cotton, October 21, 2005) and that the Castaic Lake Urban Water Management Plan is currently in question in the pending legal case, *Friends of the Santa Clara River v. Castaic Lake Water Agency*, PCL again urges the Los Angeles Planning Department to reconsider the validity of Landmark Village's identified water sources. For the reasons stated above, the Department should withdraw the DEIR, to allow for scrutiny and confirmation of the Water Supply Assessment. 12

D. Containment of Perchlorate Contamination

Castaic Lake Water Agency's 2000 Urban Water Management Plan was invalidated due by the court specifically for its failure to adequately address perchlorate problems. Despite this decision, the Landmark Village DEIR summarily relies on speculation from Valencia Water Company that it will do a sufficient job in the future of containing perchlorate contamination in the alluvial aquifer and elsewhere (E.g., 4.10-5, 6). Given this clear direction from the court, an adequate water supply assessment must scrutinize the lead water agency's assurances before accepting its supply guarantees without validation. 13

E. Analysis of climate change impacts 14

PCL is concerned that the DEIR significantly understates the substantial direct and cumulative contribution that Landmark Village, as a portion of one of the largest single development proposals in state's history, will have on California's greenhouse gas emissions. The cumulative climate impact resulting from the construction of over 20,000 units, the delivery and service of water to those units and the transportation impacts from both the permanent and temporary residents of the Newhall Ranch development will create an enormous impediment to California's 2020 targets for established greenhouse gas reduction, codified by AB 32. Given this new state objective, initiated by the administration and legislature, PCL urges that a revised EIR must consider climate change mitigation measures for Landmark Village in all, but not limited to, the following sectors: water services, energy demands, transportation infrastructure, building technology, habitat encroachment and flood control. 14

We commend the extension of the comment period to ensure full public participation in the review of this Draft Environmental Impact Report. 15 We now urge the Los Angeles Planning Department to withdraw this DEIR so that the significant gaps we have identified in this review can be adequately addressed. 16

Sincerely,

Charlotte Hodde
Water Policy Specialist

D26. Letter from Planning and Conservation League, dated February 20, 2008

Response 1

The comment requests that the County withdraw the Landmark Village Draft EIR pending further review and analysis. There is no need to "withdraw" the Draft EIR for the proposed project. For further information generally responsive to this comment, please refer to **Topical Response 3**: Public Review Opportunities. The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not raise an environmental issue, no further response is required.

Response 2

The comment addresses various concerns over the Landmark Village SB610 Water Supply Assessment (WSA). Specifically, the comment states that the WSA is inaccurate, inconsistent with (unspecified) recent court decisions, and relies on "unverified water supplies, water projects, and reports that are under legal challenge."

First, the Landmark Village WSA is consistent with the information presented in the Landmark Village Draft EIR, Section 4.10, Water Service. Second, the County has determined that the information presented in the Landmark Village WSA is accurate. Without further information concerning specific "inaccuracies," no more specific response can be provided or is necessary. Third, the Landmark Village WSA does not rely on "unverified" water supplies. Please see Draft EIR, Section 4.10, Water Service, for a detailed description of the verifiable water supplies relied upon by the Landmark Village project. Fourth, the County notes that there are legal challenges concerning various water supplies, both locally, regionally, and statewide. Despite these legal challenges, the County has made the factual determination that the Santa Clarita Valley water supplies are adequate and reliable. For information supportive of the County's factual determination, please see **Topical Response 4**: CLWA's 41,000 AFY Water Transfer, and **Topical Response 5**: Litigation Concerning Water Supplies. Finally, the Landmark Village project relies solely on local groundwater supplies to meet its potable water demands, and recycled water from the Newhall Ranch WRP to meet its non-potable water demands. As such, the Landmark Village project does not rely on CLWA's SWP supplies. Because the Landmark Village project relies upon its own independent local water supplies, the project will not result in or contribute to any significant cumulative impacts to Santa Clarita Valley water supplies.

Response 3

For information responsive to this comment, please see **Topical Response 6**: Global Climate Change And Its Effects On California Water Supplies. In addition, please see **Topical Response 8**: Greenhouse Gas Emissions And Global Climate Change. Finally, the Landmark Village Draft EIR presents alternatives to the proposed project that would result in no development (i.e., the "No Project" alternative) and reduced development (e.g., Alternative 3).

Response 4

The comment requests that the County be provided with reliable information concerning water sources and reasonable alternatives. The comment urges that the Landmark Village Draft EIR be delayed until "significant flaws" in the EIR are addressed. The comment addresses general subject areas, which received extensive analysis in the Draft EIR, Section 4.10, Water Service, and Section 5.0, Alternatives. The comment does not raise any specific issue regarding that analysis and, therefore, no more specific response can be provided or is required. However, the comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project.

Response 5

The comment claims that the Landmark Village Draft EIR "mischaracterizes" the reliability of the 41,000 acre-feet per year (afy) water transfer. First, please see the Draft EIR, Section 4.10, Water Service, which thoroughly addresses imported SWP water supplies and litigation concerning the availability of such supplies, including litigation concerning the 41,000 afy water transfer (see, Draft EIR, pp. 4.10-44–4.10-57). Second, please see **Topical Response 4**: CLWA's 41,000 AFY Water Transfer, and **Topical Response 5**: Litigation Concerning Water Supplies, for further information responsive to this comment. It also should be emphasized that the Landmark Village project does not rely on SWP supplies. The Landmark Village project will use local groundwater and recycled water from local water reclamation plants to meet its potable and non-potable demand (see, Draft EIR, pp. 4.10-3–4.10-4).

Response 6

Please see **Topical Response 4**: CLWA's 41,000 AFY Water Transfer, and **Topical Response 5**: Litigation Concerning Water Supplies.

Response 7

The comment focuses on the availability of imported water supplies. However, as stated in the Landmark Village Draft EIR, Section 4.10, Water Service, pp. 4.10-3 through 4.10-4, the Landmark Village

project does not rely on imported water supplies to meet its potable and non-potable water demand. The Draft EIR provides additional, extensive information regarding imported water supplies (see Draft EIR, pp. 4.10-44–4.10-57). The information has been confirmed to be accurate. In addition, please see **Response 13** to letter from California Water Impact Network, dated February 11, 2007, for further responsive information.

Response 8

Please see **Response 15** to letter from California Water Impact Network, dated February 11, 2007.

Response 9

The comment addresses the recent California Supreme Court decision in *Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho Cordova* (2007) 40 Cal.4th 412; it provides an interpretation of that decision; and it requests that the Landmark Village WSA be "rewritten" to comply with the directives found in the *Vineyard* decision. The County has evaluated the *Vineyard* decision relative to the proposed project. Please see **Topical Response 5**: Litigation Concerning Water Supplies.

Response 10

The comment addresses the absence of climate change consideration in DWR's Delivery Reliability Report (2005). For information responsive to this comment, please see **Topical Response 6**: Global Climate Change And Its Effects On California Water Supplies, and **Topical Response 8**: Greenhouse Gas Emissions And Global Climate Change. Please see also **Responses 45**, **46**, **55**, and **59** to letter from Center for Biological Diversity, dated February 20, 2007.

Response 11

Please see **Topical Response 5**: Litigation Concerning Water Supplies, and **Topical Response 6**: Global Climate Change And Its Effects On California Water Supplies.

Response 12

Please see **Topical Response 5**: Litigation Concerning Water Supplies. In addition, please see **Response 10** to letter from California Water Impact Network, dated February 11, 2007.

Response 13

Please see **Response 11** to letter from California Water Impact Network, dated February 11, 2007.

Response 14

Please refer to **Topical Response 6**: Global Climate Change And Its Effects On California Water Supplies, and **Topical Response 8**: Greenhouse Gas Emissions And Global Climate Change. Please see also **Responses 45**, **46**, **55**, and **59** to letter from Center for Biological Diversity, dated February 20, 2007.

Response 15

The comment commends the County for extending the public comment period on the Landmark Village Draft EIR. For information responsive to the comment, please refer to **Topical Response 3**: Public Review Opportunities. The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not raise an environmental issue, no further response is required.

Response 16

The comment addresses general subject areas, which received extensive analysis in the Landmark Village Draft EIR, Section 4.10, Water Service. The comment does not raise any specific issue regarding that analysis and, therefore, no more specific response can be provided or is required. However, the comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project.

Fierros, Daniel

From: Lynne Plambeck [lynneplambeck@access4less.net]
Sent: Wednesday, February 21, 2007 11:41 AM
To: Tae, Susan; Fierros, Daniel
Subject: Landmark/Newhall Ranch Comments
Attachments: LandmarkSCOPE Comments.doc

Hello Susan and Daniel. Our comments are attached. I will be mailing a hard copy of these comments with the indicated attachments today, so you should have the complete submittal tomorrow. We still have comments coming in from our members, so we may be submitting an additional letter in the future. 1

Susan - Can you tell me the status of the Lyon Canyon Project in Santa Clarita? 2
Thanks!
Lynne Plambeck

D27. Letter from Santa Clarita Organization for Planning and the Environment, dated February 21, 2007

Response 1

This comment is an introduction to comments that follow. No further response is required.

Response 2

The comment is noted. No further response is required given that the comment does not address or question the content of the Landmark Village Draft EIR.

california water network

Carolee K. Krieger
president

Dorothy Green
secretary

Joan Hartmann
treasurer

Malinda Chouinard
director

Yvon Chouinard
director

Michael Jackson
director

Lloyd G. Carter
director

Tom Stokely
director

December 11, 2006

Attention: County of Los Angeles
Department of Regional Planning

RE: Landmark Village

We understand that you released the above document recently and wanted to let you know that we did not receive a copy.

We believe this must have been an oversight by your consultant as we consistently received notification and review copies of your project documents and wish to continue to do so. Please make sure we are on your notification list. 1

Also, please send us a copy of this document.

Thank you,

Carolee Krieger

Carolee Krieger, President
808 Romero Canyon Road
Santa Barbara, CA 93108

FOX CANYON GROUNDWATER MANAGEMENT AGENCY

BOARD OF DIRECTORS
Lynn E. Maulhardt, Chair
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AGENCY COORDINATOR
Lowell Preston, Ph.D.

RECEIVED
DEC 26 2001
REGIONAL PLANNING
L.A. COUNTY

December 24, 2001

Los Angeles County Board of Supervisors
C/O Ms. Joanne Sturges, Executive Officer
Room 383
500 W. Temple Street
Los Angeles, CA 90012

Subject: **Final Additional Analysis and Staff Report (Water Resources) for the Newhall Ranch Specific Plan FEIR DATED October 2001**

Dear Members, Board of Supervisors:

The subject report addresses the utilization of agricultural water, state project water and reclaimed water to support a demand of 17,680 acre feet for the subject project. Additional sources of ASR banking, water from Kern Water Bank and flood flows have also been identified as potential supplies. The Fox Canyon Groundwater Management Agency (FCGMA) has reviewed the Staff Report and the Final Additional Analysis for the Newhall Ranch Specific Plan and provides the following comments:

Irrigation Water. The applicant proposes to transfer the irrigation water previously used by Newhall Ranch to be used as a supply for the Newhall Ranch Development. We concur that the agricultural irrigation water used on parcels that will be taken out of service and become part of the Newhall Ranch Project represent an existing use and can therefore be shown as a source of water for the project. This only applies to the parcels that are within the boundary of this project. We agree that this is a valid supply and we agree that the existing use can be reasonably determined by applying the California Irrigation Management Information System (CIMIS) formula. However, we believe that additional accuracy is required. The FCGMA uses CIMIS as one means of managing the groundwater within its boundary. Due to this employment of CIMIS, the FCGMA has an indepth awareness of the detailed requirements necessary to determine the quantity of irrigation water used by various crop types. The following comments apply to the use of CIMIS: 1

1. The rainfall was not accounted for in the calculation of water use. Evapotranspiration (Et) values represent the water needed by a crop type. When there is rainfall the amount of rainfall that deep percolates supplies part of the total water required for that period. This part of the needed supply would not have been drawn from groundwater. The applicant made no provision to include rainfall. This inflates the water use. 2
2. The calculated irrigation water use included an additional arbitrary factor of 60% or 70% for soil type and irrigation method that is not part of the CIMIS formula. This factor inflates the water use. 3
3. Et is applicable to irrigated acreage. The calculated value did not explain how the acreage was determined. Experience from the FCGMA has shown that the acreage is typically overstated by 10 to 20% by simply using the parcel size and not deducting areas not irrigated. 4

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- 1058 -

4. There was no description of the irrigated agricultural properties. It is assumed that the irrigation water to be transferred to supply the demand for the project is currently being used on properties that are within the project boundary. Due to difficulties of monitoring and control, we do not concur with the use of irrigation water from any area not within the project boundary. 5

If the property currently receiving the irrigation water is within the project boundary, Table 1 shows a more accurate calculation of the irrigation water used. To construct Table 1., a crop factor of 1.0 was used since there is no detailed explanation of the crops actually grown. This favors the applicant. An effective rainfall of 25% of the approximately 16 inch annual average rainfall was applied.

Table 1.

Year	Crop	Acres	Et	Rain	Crop Factor	AF	Sub Totals
2000	Alfalfa	55	62.21	4	1	266.795 8	
	Sudan/pasture	150	62.21	4	1	727.62 5	
	Veg. Row crop	722	62.21	4	1	3502.30 2	4496.723
1999	Alfalfa	55	63.08	4	1	270.783 3	
	Sudan/pasture	150	63.08	4	1	738.5	
	Veg. Row crop	709	63.08	4	1	3490.64 3	4499.927
1998	Alfalfa	115	56.39	4	1	502.070 8	
	Sudan/pasture	100	56.39	4	1	436.583 3	
	Veg. Row crop	663	56.39	4	1	2894.54 8	3833.202
1997	Alfalfa	160	61.34	4	1	764.533 3	
	Sudan/pasture	103	61.34	4	1	492.168 3	
	Veg. Row crop	663	61.34	4	1	3168.03 5	4424.737
1996	Alfalfa	105	61.28	4	1	501.2	
	Sudan/pasture	170	61.28	4	1	811.466 7	
	Veg. Row crop	537	61.28	4	1	2563.28	3875.947
	Average						4226.107

6

The irrigated acreage was not changed nor was there an additional factor employed to account for soil type and irrigation method. It is believed that, even though the average annual use is considerably less, Table 1. shows a reasonable accommodation of the proposed methodology while still relating to CIMIS concept.

The agricultural water available for transfer to the new project is on the order of 4200 to 4300 acre feet per year. If the water is used, then recycled, approximately 50% to 80% of the water can be recovered depending upon the treatment selected. Using the maximum of 80% would result in a supply of 3440 acre feet available for irrigation. This would then make up a total supply of 4300+3440 = 7740 acre feet. Adding the 3691 acre feet of reclaimed water from CLWA would bring the total excluding imported water to 7740+3691 = 11431 acre feet. The balance of water needed can then be supplied by imported water 7

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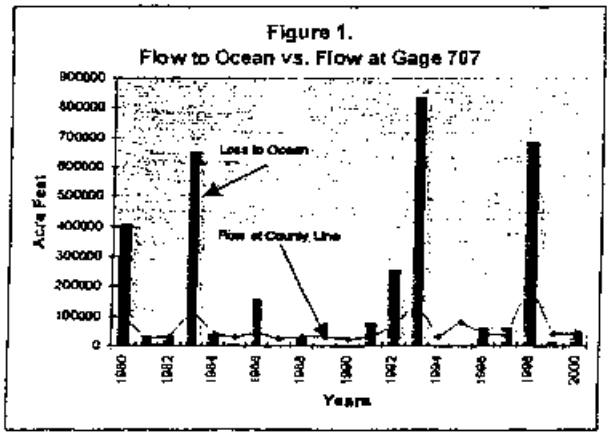
(New Imported Water 17680-11431 = 6249. Imported water would be any water obtained from a source not in hydrologic continuity with the Santa Clara River. e.g. water stored in the Kern Water Bank) 7

Regarding the ASR project. The ability of the Saugas Aquifer to function under storage and recovery operations has been shown by testing and is no longer a point of contention. However, the lack of calibration to transient conditions is still questioned. 8

The applicant addressed the impacts to Ventura County by comparing the existing and future flows at the County line during wet periods and dry years. Constructing a model calibrated to steady state conditions facilitated a conclusion that the net water flowing into Ventura County would be increased. There are two problems with this procedure; 1) the steady state model selected, and 2) the analysis using a net flow criterion.

1) The problem with the model produced by the additional analysis is that a steady state solution was used to determine the effects of the injection/extraction. Since the pumping and recharge to the aquifer varies over time, the model used to portray the system must have the ability to incorporate the changing environment to which it is exposed. The effects to an aquifer result in different pressures in the aquifer. These pressures are called heads. Steady state solutions are useful to determine the relative difference in heads due to drawdown from pumping, but they do not produce the absolute value of the head. The absolute value of the head is the true pressure in the aquifer and the pressure that produces the gradient that is used to determine the potential for flow (in this case flow into Ventura County). Steady state conditions do not incorporate regional flow caused by regional head gradients and are not appropriate to represent systems that change over time. To determine the effects of time dependent influences, a transient model is required. The difference between a transient model and a steady state model is that a steady state model generates one set of heads and a transient model produces a set of heads for each time period. 9

The proponent's response to this problem contended that one steady state pressure head was compared to a new steady state pressure head thereby eliminating the necessity for transient calibration. This is inaccurate for two reasons; 1) the steady state model does not apply to a system constantly under going changes, and 2) because the question of concern is the absolute value of the pressure head, not the relative difference between two heads.



10

The analysis of the results of the model is also inaccurate because increasing the water crossing the County line at USGS Gauging Station Number 707 during a wet year does not contribute to recharge and

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consequently has no value. This happens because river water is already being lost to the ocean. Figure 1. shows the water lost to the ocean in wet years as compared to river flow. It is easy to see that any time there is increased flow at the County Line there is an even greater loss to to the ocean during that same period. This leads to discounting the potential benefit of additional water during wet years. 10

An adequate model of the river system is complicated and difficult. However, a solution that would be adequate consists of injecting 9000 acre feet before the first 4100 acre feet is extracted. Thereafter an injection of 4500 acre feet may be followed by an extraction of 4100 acre feet without damage to downstream flows. This solution adds an additional 4500 acre feet to the Saugas Aquifer that is never removed. 11

In summary, there are three problems:
1) The calculation of the agricultural water used.
2) The type of model selected for analysis.
3) The wet year/dry year analysis.

All three of these issues can be resolved by:
1) Limiting the groundwater use to the 4300 acre feet that is available from the current agricultural irrigation water.
2) Increasing the imported water to 6249 acre feet. (State water or water stored in a location not hydrologically connected to the Santa Clara River)
3) Injecting 9000 acre feet during the first year of the ASR program and subsequently withdrawing 4100 acre feet as proposed. After the first year, 4500 acre feet could be added and 4100 acre feet extracted. 12

It is requested that this letter be made a part of the Administrative Record.

Very truly yours,

Lowell Preston, Ph.D.

cc: Lee Stark, Los Angeles County Planning Department, 320 Temple St., Los Angeles Ca 90012

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D28. Letter from Friends of the Santa Clara River, dated February 25, 2007

Response 1

The comment attaches a copy of a letter from Fox Canyon Groundwater Management Agency, dated December 24, 2001. Fox Canyon Groundwater Management Agency is a water management agency in Ventura County. Fox Canyon submitted the letter to the Los Angeles County Board of Supervisors in December 2001, in connection with the Newhall Ranch Final Additional Analysis, and, specifically, as to the water resource analysis conducted for the entire Newhall Ranch Specific Plan. In that letter, Fox Canyon agrees that agricultural irrigation water used on parcels that will be taken out of service and become part of the Newhall Ranch Specific Plan represent an existing use and, therefore, can be shown as a source of water for the Specific Plan.

The County provided detailed written responses to each of the comments presented in Fox Canyon's 2001 letter. Those responses, which are incorporated by reference, are found in the Newhall Ranch Final Additional Analysis, Volume III (March 2003), pp. RTC-515 through RTC-524. As previously stated, the Newhall Ranch Final Additional Analysis is one of the documents already incorporated by reference, and available for public inspection and review at the Department of Regional Planning, 320 W. Temple Street, Room 1346, Los Angeles, California, Attn: Daniel Fierros. The Los Angeles County Board of Supervisors has already considered the comments and responses (including Fox Canyon's) prior to its approval of the Newhall Ranch Specific Plan. Nonetheless, Fox Canyon's 2001 letter, again, will be considered prior to consideration and final action on the Landmark Village project.

Letter No. D29

Sespe Institute, Inc.

P.O. Box 1346, Ojai, California 93024

27 February 2007

Daniel Fierros
Los Angeles County Dept. of Regional Planning
320 W. Temple Street, Room 1346
Los Angeles, CA 90012

A-H-9

Subject: Landmark Village Draft EIR (SP 00-198/VTTM No. 53108/RCUP 200500112/OTP 00196/CUP 00-196)

Dear Mr. Fierros:

The Sespe Institute (Sespe Institute) is a California nonprofit corporation dedicated to the conservation and management of cultural and natural resources around the world through research, education, and the sharing of information and technology. 1

Sespe Institute is very concerned about the proposed project because of the tremendous impacts this project will have on the natural and human environment. Sespe Institute is concerned that the DEIR fails to adequately identify, describe, analyze, and propose mitigation for impacts on: traffic, air quality, biological resources, cultural resources, utilities, water supply, and open space, to name just a few. 2

Sespe Institute has reviewed, and concurs with, the comment letters of the Audubon California and David Magney Environmental Consulting (prepared for the Friends of the Santa Clara River and California Native Plant Society), and includes them herein by reference. 3

Sespe Institute wishes to take this opportunity to make several comments not addressed by the referenced letters, namely regarding the resource and economic impacts the project will have on the residents of the region. 4

Since the Newhall Ranch project, which includes the Landmark Village phase, is the largest development project to date in California, with a projected growth in the human population by about 70,000, there is no question that the demands on utilities will impact every citizen in the region, including those in Los Angeles and Ventura Counties, and beyond. However, those impacts were not adequately analyzed and certainly not mitigated for. 5 6

The average household used 6,037 kilowatt hours (kWh) of electricity in 2001, based on the most recent available data from the California Energy Commission for the Los Angeles Department of Water & Power service area. The California Gas Report (for 2005) shows that the average household consumption of natural gas was 49,600 cubic feet. 7

The addition of 1,444 residential units in just the Landmark Village portion of Newhall Ranch will require approximately 8,717,428 kWh of electricity and 71,622,400 cubic feet of natural gas. Expand this out to include the rest of the houses proposed in the Newhall Ranch Specific Area Plan, and the demand for electricity and natural gas will be greatly increased. 8

Mission Statement: The Sespe Institute is dedicated to the conservation and management of cultural and natural resources around the world through research, education, and the sharing of information and technology.

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Has a private utility company ever said they cannot meet demands of new customers? No, and they will not, so simply asking a service, such as SCE, will not provide a true picture of the situation. With increased demand and limited supplies, prices will rise, as has happened since the publication of the Newhall Ranch Specific Area Plan. Conditions have changed and those changes should have been addressed in the Landmark Village DEIR. 9

The fact is that California residents and businesses, as well as the same beyond California, have experienced huge increases in the cost of electricity and natural gas and experienced periodic blackouts when demand exceeds supply. 10 The effects of global warming are already subjecting residents and businesses to increased demands for electricity and natural gas, and adding large numbers of houses and commercial building space without sufficient mitigation will result in significant impacts to all users. 11

The DEIR relies solely on energy efficiency standards to minimize the demands on these resources; however, just the cumulative demands will result in significant shortages and increased prices for kilowatts and therms, for which there is no mitigation. The DEIR is entirely inadequate in this area. 12

Sespe Institute recommends that the DEIR be revised to fully analyze the increased demands that the Landmark Village project will have on the supply and cost to all consumers in southern California, and recommend mitigation measures to offset those impacts. 13

Sespe Institute fully supports energy efficiency for all buildings and appliances used in the new buildings proposed; however, since energy efficiency will not offset the increased demands, other mitigations are needed. For example, the technology exists today for each building to incorporate active electric generation through photovoltaic solar collectors. If each building constructed incorporated a solar collector that generated on average enough electricity to meets the needs of that building, the proposed project would not have any adverse impacts on the supply of electric energy obtained from the utility grid system. In fact, the project may help to reverse the cumulative demands on electricity. 14

Sespe Institute is also concerned about the amount of additional traffic this project, and subsequent projects, will have on State Route (SR) 126 and Interstate 5 (I-5). 15 Currently, SR 126 is not terribly congested and traffic jams are rare. However, this will certainly change after the Landmark Village project is built. 16 Commute and travel times between Ventura County and Los Angeles County are already significantly longer than just five (5) years ago, and the increases in vehicle traffic on SR 126 will increase to unacceptable levels. 17 The real lack of public transportation to and from Newhall Ranch, not to mention the basic design of Newhall Ranch, will require 99% of residents and workers to use automobiles to travel both locally and regionally, impacting everyone else by increasing commute and travel times through the area. 18 Simply adding lanes to the existing highways for portions will not adequately mitigate for the significant increase in vehicles using them. 19

Mission Statement: The Sespe Institute is dedicated to the conservation and management of cultural and natural resources around the world through research, education, and the sharing of information and technology.

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Thank you for considering the concerns of Sespe Institute. Please require that these issues be addressed as described, and recirculate the EIR for public review. 20

Respectfully,

David L. Magney
President

Mission Statement: The Sespe Institute is dedicated to the conservation and management of cultural and natural resources around the world through research, education, and the sharing of information and technology.

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D29. Letter from Sespe Institute Inc., dated February 27, 2007

Response 1

The comment provides factual background information only and does not raise an environmental issue within the meaning of CEQA. The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not raise an environmental issue regarding the content of the Draft EIR, no further response is required.

Response 2

The comment generally addresses traffic, air quality, biological resources, cultural resources, utilities, water supply and open space, all of which received extensive analysis in the Landmark Village Draft EIR, Section 4.4, Biological Resources; Section 4.7, Traffic/Access; Section 4.9, Air Quality; Section 4.10, Water Service; Section 4.16, Parks and Recreation; Section 4.19, Utilities; and Section 4.22, Cultural Resources. The comment does not raise any specific issue regarding those analyses and, therefore, no more specific response can be provided or is required.

The comment also expresses an opinion, which will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not address or question the content of the Draft EIR, no further response is required.

Response 3

The comment is noted. Responses to the Audubon California, David Magney Environmental Consulting, Friends of the Santa Clara River, and California Native Plant Society comment letters are included in the Landmark Village Final EIR.

Response 4

This comment is an introduction to comments that follow. No further response is required.

Response 5

The comment states that Newhall Ranch is the largest project in California, which is incorrect as the County of Los Angeles is presently processing Centennial, a project larger in scale and scope when compared to the Newhall Ranch Specific Plan, of which Landmark Village is a part. The Newhall Ranch Specific Plan Program EIR estimated a population of about 68,000.

Response 6

The comment claims that demands on utilities will impact every citizen in the region and beyond and that those impacts were not adequately analyzed or mitigated in the Landmark Village Draft EIR. There are no documents or other data supporting this claim, and the County does not concur with the comments. In further response, the Draft EIR, Section 4.19, Utilities, analyzes project and cumulative impacts on various utilities, and includes mitigation already imposed by the Newhall Ranch Specific Plan Program EIR (see, pp. 4.19-9–4.19-11).

Response 7

The California Energy Commission 2002-2012 Electricity Outlook report estimates that a monthly average for electrical consumption per household is 500 kilowatt hours (kWh). This equates to a yearly average of 6,000 kWh per household. This rate depends on many factors such as climate and type of facility, type of energy using equipment, and other factors. The 2006 California Gas report estimates the average household uses 532 therms of natural gas per year, which is the annual equivalent of 52,157 cubic feet.

Response 8

The Landmark Village Draft EIR, Section 4.19, Utilities, pp. 4.19-6 and 4.19-8, estimates the electrical use for the 1,444 dwelling units to be 8,780,964 kWh/yr and 90,445,200 cubic feet per year of natural gas. As a project level EIR, the Landmark Village Draft EIR focuses on the impacts of the proposed project and not the previously approved Newhall Ranch Specific Plan.

Response 9

The comment raises political, social, and economic issues that are beyond the scope of the Landmark Village Draft EIR. The County also does not concur with the opinions expressed in the comment, and refers the reader to the Draft EIR, Section 4.19, Utilities. The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not address or question the content of the Draft EIR, no further response is required.

Response 10

Increased costs for natural gas and electrical use have been experienced by all users in southern California. The use of the word "huge" when reflecting rate increases is subjective, reflects economic issues, and is not material to the significant environmental impacts of the proposed Landmark Village project.

Response 11

Please see **Topical Response 6**: Global Climate Change and Its Effects on California Water Supplies; **Topical Response 7**: Global Climate Change and Its Effects on Sensitive Biological Resources; and **Topical Response 8**: Greenhouse Gas Emissions and Global Climate Change, for responsive information regarding global warming.

Response 12

The Landmark Village Draft EIR does not conclude that there will be cumulative utility impacts. The comment provides no source for the alleged energy shortages. The comment expresses opinions, which will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. However, because the comment does not address or question the content of the Draft EIR, no further response is required.

Response 13

The Landmark Village Draft EIR, Section 4.19, Utilities, analyzes the supply and demand of the proposed project and addresses cumulative impacts. Additionally, *CEQA Guidelines* Section 15131(a) states that economic effects of a project shall not be treated as significant effects. Additionally, the focus of the analysis should be on the physical changes resulting from the proposed project. The supply of electricity and natural gas to the Landmark Village project would not create any physical changes other than those currently anticipated by Southern California Edison and Southern California Gas Company in their established infrastructure plan. A revision to the Landmark Village Draft EIR, Section 4.19, Utilities, is not required.

Response 14

The comment states that Sespe Institute supports energy efficiency and would like to see the incorporation of active electric generation through photovoltaic solar collectors. The comment does not raise any issue with respect to the adequacy or content of the Draft EIR; however, as evidenced below, Landmark Village, as with all of Newhall Ranch, incorporates the components of a sustainable or smart growth community.

- **Mix of Land Uses.** Landmark Village, along with the other villages in Newhall Ranch, will include a broad range of housing types, including affordable housing, along with commercial, office, and public facilities. As to Landmark Village, a diverse range of 1,444 homes (308 single-family and 1,136 multi-family units) would be provided. To minimize and shorten vehicle trips, most homes will be within walking distances to the Landmark Village community's commercial and mixed-use areas, elementary school site, community park, and trail system. Finally, Landmark Village is located

adjacent to the Valencia Commerce Center, one of the largest employment centers in the Santa Clarita Valley. Bike and pedestrian trails within Newhall Ranch and Landmark Village will connect to trails within the Valencia Commerce Center.

- **Provision of Jobs.** A portion of Newhall Ranch's projected 19,000 new jobs would be offered through Landmark Village's mixed-use and commercial areas. Newhall Ranch is adjacent to the existing Valencia Gateway (which includes the Valencia Commerce Center), which presently provides 50,000 jobs. Other development within Valencia Gateway will create an additional 30,000 jobs. When completed, the job centers in Newhall Ranch and Valencia will have resulted in the creation of approximately 100,000 jobs in the Santa Clarita Valley. A balanced jobs-housing base is a critical component to a sustainable community because it allows people to work close to home and minimizes vehicle miles traveled.

- **Locating of Residential Uses in Close Proximity to Commercial Services/Public Spaces.** Nearly 60 percent of the residential units in Newhall Ranch will be located within walking distance of village or commercial centers. This is clearly documented by the Landmark Village land plan. Residents within Landmark Village will be able to utilize paseos/trails and/or the Santa Clara River Regional Trail to walk to commercial centers, private recreational facilities, the elementary school and a community park. As stated above, this traditional neighborhood design minimizes vehicle trips.

- **Provision of Transit and Light Rail Right-of-Way.** Newhall Ranch, including Landmark Village, will be part of the Santa Clarita Transit system and will pay its fair share for transit service to the community. Transit improvements within Newhall Ranch will include a park-and-ride lot, a future transit station, transfer station, bus stops, and preservation of light rail right-of-way. Landmark Village will include a total of five bus stops, a park-and-ride lot, and the preservation of light rail right-of-way along SR-126. The provision of transit and the accommodation of light rail encourage residents to rely less on vehicular travel.

- **Open Space, Recreation, and Preservation of Sensitive Resource Areas.** Newhall Ranch, of which Landmark Village is a part, includes the preservation of the High Country, Salt Creek Corridor and the Santa Clara River and internal open areas—a total of nearly 7,800 acres. A total of three community parks (Landmark includes the first) and up to ten neighborhood parks will be provided as part of Newhall Ranch. Finally, private recreation facilities will be provided throughout the entire Ranch providing additional recreational opportunities to residents. In short, Landmark Village's design connects jobs, retail, schools, parks, and recreation facilities with the community's trail system to promote walking and biking while minimizing vehicle trips.

- **Hierarchy of Trails.** Newhall Ranch will include over 50 miles of trails to encourage pedestrian mobility. Landmark Village includes a 2-mile extension of the Santa Clara River trail, with direct connections to residential, commercial, and park uses, and various paseos including the paseo running along "A" Street or the Landmark Village Spine Road. This design also is intended to minimize vehicle trips.

- **Reducing Impermeable Surfaces.** To curtail urban runoff and maximize groundwater recharge, Newhall Ranch, including Landmark Village, will utilize open/soft bottom channels, smaller street sections, where possible, increased native landscape areas, and non-structural water quality treatment improvements.

- **Water Conservation and Re-Use.** Newhall Ranch, including Landmark Village, will utilize native, drought-tolerant plants in the community's landscaping, use recycled water for irrigation, and evapotranspiration controllers (i.e., weather-sensitive sprinklers) to reduce potable water demand and runoff.

- **Traffic/Transportation Improvements.** Landmark Village's traffic circulation plan, which is consistent with all of Newhall Ranch, minimizes vehicle trips and reduces greenhouse gas (GHG) emissions through the design of internal roads in conjunction with homes, school site, commercial areas, and trail system. Transit is included in the traditional neighborhood design, and it includes a park-and-ride lot and bus stops. Additionally, a 5-mile right-of-way for a potential Metrolink light rail extension is accommodated along SR-126. Trails and bike paths leading to close-to-home jobs, neighborhood-serving retail, and the school encourage residents to reduce vehicle miles traveled. The applicant also has committed to fund $300 million in roadway improvements in the Santa Clarita Valley in conjunction with the Newhall Ranch Specific Plan, including Landmark Village, to improve traffic movement and circulation.

The project applicant also has prepared a "Sustainability Summary" for Landmark Village that identifies the above project design features and includes green building measures. Please see **Appendix F** of this Final EIR for this summary.

Response 15

The comment addresses traffic issues, which received extensive analysis in the Landmark Village Draft EIR, Section 4.7, Traffic/Access. The Draft EIR concluded that traffic/access impact would be mitigated to a less than significant level. The comment does not raise any specific issue regarding that analysis and, therefore, no more specific response can be provided or is required. However, the comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project.

Response 16

Please see **Response 15**, above.

Response 17

Please see **Response 15**, above.

Response 18

The Landmark Village project provides for a park-and-ride lot, various transit improvements, and the reservation of right-of-way for future rail service. These project features support alternatives to automobile transportation. Please also see **Response 15**, above.

Response 19

Please see **Responses 15** and **18**, above.

Response 20

The comment letter did not provide any significant new information that would require recirculation pursuant to *CEQA Guidelines* §15088.5(a). No further response is required.