FINAL
ENVIRONMENTAL IMPACT REPORT
AV Solar Ranch One Project

COUNTY OF LOS ANGELES
Department of Regional Planning
Impact Analysis Section
320 West Temple Street
Los Angeles, California 90012

County Project No. R2009-02239
Vesting Tentative Tract Map No. TR071035
Conditional Use Permit No. RCUPT200900026
Environmental Review No. RENVT200900027
SCH No. 2009041145

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SECTION 1.0
INTRODUCTION

1.1 PURPOSE

Before approving a project, the California Environmental Quality Act (CEQA) requires the Lead Agency to prepare and certify a Final Environmental Impact Report (Final EIR). This document represents the Final EIR for AV Solar Ranch One Project (County of Los Angeles Project No. R2009-02239; State Clearinghouse No. 2009041145). This Final EIR has been prepared in accordance with Section 15132 of the *CEQA Guidelines*, as amended. As required by this section, the Final EIR shall consist of the following:

- The Draft EIR or a revision of the Draft EIR.
- Comments and recommendations received on the Draft EIR, either verbatim or in summary.
- A list of persons, organizations, and public agencies commenting on the Draft EIR.
- The responses of the Lead Agency to significant environmental points raised in the review and consultation process.
- Any other information added by the Lead Agency.

The Lead Agency must provide each agency that commented on the Draft EIR with a copy of the Lead Agency's proposed response at least 10 days before certifying the Final EIR.

1.2 ENVIRONMENTAL REVIEW PROCESS

As defined by Section 15050 of the *CEQA Guidelines*, the County of Los Angeles is the "Lead Agency" responsible for preparing the EIR for the Project. The County determined that preparation of an EIR was required for the Project after conducting preliminary review and preparing an Initial Study (April 13, 2009) for the proposed Project in accordance with Sections 15060 and 15063 of the *CEQA Guidelines*. Following this determination, a Notice of Preparation (NOP) was issued by the County of Los Angeles for the required 30-day review period from May 1, 2009 through June 1, 2009 to solicit early comments on the proposed content of the Draft EIR (see Appendix A to the Draft EIR). All NOP comments relating to the EIR were reviewed and the issues raised in those comments were considered in the preparation of the Draft EIR.

The Draft EIR was circulated for a 45-day public review period as required by CEQA from June 16, 2010 to July 30, 2010. The County of Los Angeles Regional Planning Commission held a public hearing on June 30, 2010 and took public testimony.

1.3 CONTENTS OF THE FINAL EIR

This document dated August 2010, together with the Draft EIR dated June 2010 for the proposed Project and the Technical Appendices to the Draft EIR dated June 2010, constitute the "Final EIR" for the proposed project. The Draft EIR consisted of the following:

- The Draft EIR, which included the environmental analysis for the proposed Project; and
- Technical Appendices, which included:
  - Appendix A: Notice of Preparation, CEQA Initial Study, Response Letters, and Response Letter Coordination
  - Appendix B: Geotechnical Engineering Report
  - Appendix C: Drainage Concept Report
  - Appendix D: Air Quality Emission Calculations and Wind Rose Data
  - Appendix E: Biota Report
  - Appendix F: Phase I Cultural Resources Technical Report
  - Appendix G: Traffic Impact Analysis Report
  - Appendix H: Construction Equipment and Truck Delivery Details
  - Appendix I: Noise Technical Report
  - Appendix J: Groundwater Characteristics at the AV Solar Ranch One Site
  - Appendix K: Vegetation Management and Fire Control Measures Plan

This Final EIR is organized in the following five sections:

- Section 1.0 (Introduction): This section provides a brief introduction to the Final EIR and its contents.
- Section 2.0 (Revisions to the Draft EIR): This section consists of minor text changes made to the Draft EIR as a result of comments raised during the public review process.
- Section 3.0 (Responses to Regional Planning Commission Hearing Comments): This section provides responses to the public testimony and Commissioners' comments at the public hearing held by the Regional Planning Commission.
- Section 4.0 (Comments and Responses to Written Comments): This section provides each written comment letter submitted by both public agencies and interested parties, and the responses to the comments (prior to each individual comment letter).

- Section 5.0 (Mitigation Monitoring and Reporting Program): This section includes the Mitigation Monitoring and Reporting Program that identifies the mitigation measures, the monitoring phase, and the applicable department or agency that is responsible for ensuring each recommended mitigation measure is implemented.

SECTION 2.0
REVISIONS TO THE DRAFT EIR

2.1 INTRODUCTION

Minor text changes, additions, or modifications have been made to the Draft EIR for the proposed AV Solar Ranch One Project. The text revisions presented herein have been made in response to staff analysis and comments received as part of the public review and hearing process, as well as to address mitigation measure refinements. The following sections summarize text revisions to the Draft EIR, by Draft EIR section. Text additions are shown in underline format and deleted text is shown in strikethrough. The individual pages of the Draft EIR that have been revised are presented at the end of this section.

Due to the minor nature and extent of the text changes that are required and presented in this section, the changes are provided individually rather than in a reproduction of the entire Draft EIR. The presentation of revisions to the Draft EIR is consistent with California Environmental Quality Act Guidelines Section 15132 detailing required Final EIR contents.

2.2 SECTION 1.0 – INTRODUCTION

No revisions were required for Section 1.0 (Introduction) of the Draft EIR.

2.3 SECTION 2.0 – EXECUTIVE SUMMARY

The text in Table 2-1 (Summary of Environmental Impacts, Mitigation Measures, and Resulting Levels of Significance) of the Draft EIR has been revised for Biological Resource Mitigation Measures 5.7-1 (Habitat Enhancement and Vegetation Management Plan), 5.7-2 (Off-site Mitigation for Loss of Habitat) and 5.7-7 (Blainville's Horned Lizard Capture and Relocation). A new Mitigation Measure 5.7-13 (Pre-construction Desert Tortoise Surveys) has been added as a precautionary measure based on a recommendation from the USFWS. In addition, the mitigation measures of the Draft EIR for Traffic and Access have been revised for Mitigation Measure 5.11-1 (Provide Adequate Worksite Traffic Control) and a new Mitigation Measure 5.11-3 (Limit 50 Percent of Truck Deliveries to Off-peak Hours) has been added.

2.4 SECTION 3.0 – GENERAL DESCRIPTION OF ENVIRONMENTAL SETTING

No revisions were required for Section 3.0 (General Description of Environmental Setting) of the Draft EIR.

2.5 SECTION 4.0 – PROJECT DESCRIPTION

No revisions were required for Section 4.0 (Project Description) of the Draft EIR.

2.6 SECTION 5.0 – ENVIRONMENTAL IMPACT ANALYSIS

The text in Section 5.7.5 (Biological Resources, Mitigation Measures) of the Draft EIR has been revised for Mitigation Measures 5.7-1, 5.7-2, 5.7-7, and new Mitigation Measure 5.7-13 as described above for Table 2-1 in the Executive Summary (Section 2.0). The text in Section 5.10.2 (Visual Qualities, Environmental Setting) of the Draft EIR has been revised to discuss the Desert Pines Wildlife Sanctuary in response to an oral comment received from a member of the public at the Regional Planning Commission Hearing on June 30, 2010.

The text in Sections 5.11.1.2.4 and 5.11.1.2.5 (Traffic and Access, Regulatory Setting) and Section 5.11.5 (Traffic and Access, Mitigation Measure 5.11-1 and new Mitigation Measure 5.11-3 as described above for Table 2-1 in the Executive Summary) of the Draft EIR has been revised in response to Caltrans comments on the Draft EIR.

2.7 SECTION 6.0 – ALTERNATIVES TO THE PROPOSED PROJECT

No revisions were required for Section 6.0 (Alternatives to the Proposed Project) of the Draft EIR.

2.8 SECTION 7.0 – OTHER CEQA CONSIDERATIONS

The text in Section 7.1.1 (Other CEQA Considerations, Change of Character, Project Site) of the Draft EIR has been revised to discuss the Desert Pines Wildlife Sanctuary in response to an oral comment received from a member of the public at the Regional Planning Commission Hearing on June 30, 2010.

2.9 SECTION 8.0 – MANDATORY FINDINGS OF SIGNIFICANCE

No revisions were required for Section 8.0 (Mandatory Findings of Significance) of the Draft EIR.

2.10 SECTION 9.0 – REFERENCES

No revisions were required for Section 9.0 (References) of the Draft EIR.

2.11 SECTION 10.0 – ORGANIZATIONS CONSULTED

No revisions were required for Section 10.0 (Organizations Consulted) of the Draft EIR.

2.12 SECTION 11.0 – LIST OF PREPARERS

No revisions were required for Section 11.0 (List of Preparers) of the Draft EIR.

2.13 APPENDICES (APPENDIX A THROUGH K)

No revisions were required for any of the appendices (Appendices A through K) in the Draft EIR.

The text revisions to individual pages of the Draft EIR (Table 2-1, Section 5.7, Section 5.10, Section 5.11, and Section 7.0) follow in sequential order.

TABLE 2-1 (CONTINUED)
SUMMARY OF ENVIRONMENTAL IMPACTS, MITIGATION MEASURES, AND RESULTING LEVELS OF SIGNIFICANCE

Environmental Impact Summary			
Project Site	Off-site Transmission	Mitigation Measures	Resulting Level of Significance
impacts to PM_{10} and NO_X emissions during construction with implementation of air quality controls. During operation, the Project would not result in cumulative considerable increases for any criteria pollutant.	considered with the facility site construction) would not result in a cumulatively considerable net increase in PM_{10} or NO_X. Operation of the transmission line would not result in cumulative considerable increases for any criteria pollutant.	Would be Met. MM 5.6-2: Develop and Implement Fugitive Dust Emission Control Plan. MM 5.6-3: Dust Plume Response Requirement. MM 5.6-4: Off-Road Diesel-fueled Equipment Standards. MM 5.6-5: Limit Vehicle and Equipment Use. MM 5.6-6: Heavy Duty Diesel Water Haul Vehicle Equipment Standards. MM 5.6-7: On-Road Vehicle Standards. MM 5.6-8: Properly Maintain Mechanical Equipment. MM 5.6-9: Restrict Engine Idling to 5 Minutes. MM 5.6-10: Off-Road Gasoline-fueled Equipment Standards.	significant
BIOLOGICAL RESOURCES			
The Project construction and operation would result in temporary and permanent removal of habitat, as well as habitat modification resulting from Project-related shading and fuel modification (vegetation management).	The Project transmission line construction and operation would result in temporary and permanent removal of habitat.	MM 5.7-1: Habitat Enhancement and Vegetation Management Plan. Prior to issuance of a grading permit, the Project Applicant shall develop a Habitat Enhancement and Vegetation Management Plan (HEVMP) to compensate for impacts to existing vegetation communities by preserving and enhancing the remaining vegetation within the Project site. The HEVMP shall also provide measures to ensure minimal impacts to habitat along the off-site transmission line. In areas suitable for on-site mitigation, the HEVMP shall identify appropriate mitigation objectives, standards, and monitoring/reporting requirements to enhance habitat such that the resulting habitat values would be greater than those lost as a result of project implementation. These habitat values would include nesting and foraging habitat for	

TABLE 2-1 (CONTINUED)
SUMMARY OF ENVIRONMENTAL IMPACTS, MITIGATION MEASURES, AND RESULTING LEVELS OF SIGNIFICANCE

Environmental Impact Summary			
Project Site	Off-site Transmission	Mitigation Measures	Resulting Level of Significance
		songbirds, foraging habitat for raptors and owls, and high diversity and abundance of native forbs/wildflowers. In areas rendered unsuitable for mitigation due to proposed development, the HEVMP shall identify appropriate restrictions, such as limiting noxious weeds, but shall not impose mitigation standards. The HEVMP shall be prepared by a qualified restoration biologist experienced with desert habitat restoration, and shall specify appropriate revegetation and management practices for the following portions of the Project site to the satisfaction of LACDRP: • Mitigation and Avoidance Areas (refer to Figure 5.7-11 of this DEIR): 1. Drainage A, a 100-foot setback, and the associated wildlife travel route (47.1 acres) 2. Drainage B and a 20-foot buffer (approximately 6 acres) 3. The southernmost portion of the Project site along Drainage C, where no development is proposed (45 acres) 4. The Joshua tree recruitment area (8.6 acres, including buffer) • Areas of Modified/Impacted Habitat (Unsuitable for Mitigation): 1. All portions of the site within the fire breaks (217 acres) 2. All interior portions of the site within the proposed solar arrays, excluding locations of proposed infiltration basins and fire breaks (1,336 acres) 3. All portions of the site to be occupied by proposed infiltration basins (253 acres) In general, for each of the locations enumerated above, the HEVMP	

TABLE 2-1 (CONTINUED)
SUMMARY OF ENVIRONMENTAL IMPACTS, MITIGATION MEASURES, AND RESULTING LEVELS OF SIGNIFICANCE

Environmental Impact Summary			
Project Site	Off-site Transmission	Mitigation Measures	Resulting Level of Significance
		shall specify, at a minimum, the following (specific details vary depending on location, and are described in the paragraphs that follow): • The location and extent of any on-site enhancement/revegetation areas, to be depicted graphically on an aerial photograph or schematic of appropriate scale • The quantity and species of plants to be seeded (if necessary), including the locations where each type of vegetation would be created • A schedule and action plan to maintain and monitor the enhancement/revegetation areas • A list of success criteria (e.g., growth, plant cover, plant/wildlife diversity) by which to measure success of the enhancement/revegetation effort • Contingency and/or adaptive management measures in the event that enhancement/revegetation efforts are not successful In addition, the standards and practices set forth in the HEVMP for each area shall conform to the requirements stated below: • Within the setback zones surrounding Drainage A, Drainage B, and Drainage C the HEVMP shall provide for 101 acres of on-site mitigation, as well as 6 acres of additional avoidance area (due to its small and isolated nature, the 6-acre area surrounding Drainage B is not included as suitable mitigation land, but would nonetheless be avoided), and shall ensure the following:	

TABLE 2-1 (CONTINUED)
SUMMARY OF ENVIRONMENTAL IMPACTS, MITIGATION MEASURES, AND RESULTING LEVELS OF SIGNIFICANCE

Environmental Impact Summary			
Project Site	Off-site Transmission	Mitigation Measures	Resulting Level of Significance
		1. Drainages A, B, and C, including adjacent buffer areas shown on Figures 5.7-7 and 5.7-11, as well as the local wildlife travel route associated with Drainage A, shall be set aside, preserved, and enhanced, and no Project-related disturbance shall be permitted in these areas. 2. Any anthropogenic discontinuities in the existing vegetation (unofficial roads, dump sites, etc.) within the ephemeral drainage setbacks shall be remedied, and such areas shall be seeded with native plant species characteristic of the surrounding vegetation. 3. Vegetative cover in herbaceous communities (grasslands, wildflower fields) shall exceed 95 percent; of this, ~~non-native~~ invasive forbs (as identified by the California Invasive Plant Council [Cal-IPC]) shall not exceed five percent cover. Bare ground shall not exceed five percent excluding bare ground located within the channel bottom of an ephemeral drainage or bare ground where there is clear evidence that the bare ground was the result of mammal activity (burrows, wildlife trails, etc.). 4. Vegetative cover in shrub-dominated communities (desert saltbush scrub, rabbitbrush scrub) shall exceed 90 percent, and shrub cover shall exceed 30 percent. ~~Non-native~~Invasive forbs and shrubs combined shall not exceed five percent cover, and bare ground shall not exceed five percent excluding bare ground located within the channel bottom of an ephemeral drainage or bare ground where there is clear	

TABLE 2-1 (CONTINUED)
SUMMARY OF ENVIRONMENTAL IMPACTS, MITIGATION MEASURES, AND RESULTING LEVELS OF SIGNIFICANCE

Environmental Impact Summary			
Project Site	Off-site Transmission	Mitigation Measures	Resulting Level of Significance
		evidence that the bare ground was caused by mammal activity (burrows, wildlife trails, etc.). 5. In Drainages A and C and the adjacent setback/buffer areas as shown on Figure 5.7-7, vegetation in the area shall remain suitable for foraging by burrowing owls and other grassland bird species. Habitat enhancement/revegetation shall be implemented if necessary to ensure continued suitability. 6. Joshua trees and junipers shall be planted, to improve habitat suitability for sensitive bird species and increase the likelihood that these areas will be occupied by such special-status species as loggerhead shrikes and long-eared owls. • Within the Joshua tree recruitment area, the HEVMP shall provide 8.6 acres of mitigation land, and shall ensure the following: 1. The Joshua tree recruitment area and a 50-foot buffer from the Joshua tree seedlings shall be set aside and preserved, and no Project-related disturbance shall be permitted in this area. 2. Any anthropogenic discontinuities in the existing vegetation (other than the County roadbed of West Avenue C, which passes through this area) shall be remedied, and such areas shall be seeded with native plant species characteristic of the surrounding vegetation. 3. Measures shall be implemented to encourage the continued recruitment of Joshua trees into this area. Such measures may include standards for herbaceous and shrub cover, removal of non-native plants and wildlife, and others.	

TABLE 2-1 (CONTINUED)
SUMMARY OF ENVIRONMENTAL IMPACTS, MITIGATION MEASURES, AND RESULTING LEVELS OF SIGNIFICANCE

Environmental Impact Summary			
Project Site	Off-site Transmission	Mitigation Measures	Resulting Level of Significance
		4. To provide nesting and perching habitat and increase structural diversity within restoration areas, native shrub species associated with Joshua tree woodland (including Mojave yucca, sage, box-thorn, and buckwheat, as noted in the County General Plan) shall be included in the planting palette. • Within the proposed fire breaks, no suitable on-site mitigation opportunities exist. However, the HEVMP shall ensure the following: 1. To prevent the potential spread of fire onto the Project site, the proposed fire breaks shall be maintained clear of vegetative cover through mechanical clearing and selective herbicide use. 2. If herbicides are used as approved by LACDRP to control vegetation, they shall be applied by a qualified individual and in a manner consistent with the product labeling. Under no circumstances shall herbicides be allowed to pass into any ephemeral drainage. 3. Under no circumstances shall forb species identified by the California Invasive Plant Council (Cal-IPC) as invasive weeds be allowed to thrive in the fire breaks, or as required by LACFD. Cover of these species, collectively, shall be maintained at or below five percent. • Within all interior portions of the site within and adjacent to the proposed solar arrays, excluding locations of proposed infiltration basins, no suitable on-site mitigation opportunities would exist.	

TABLE 2-1 (CONTINUED)
SUMMARY OF ENVIRONMENTAL IMPACTS, MITIGATION MEASURES, AND RESULTING LEVELS OF SIGNIFICANCE

Environmental Impact Summary			
Project Site	Off-site Transmission	Mitigation Measures	Resulting Level of Significance
		However, the HEVMP shall ensure the following: 1. To control fugitive dust, vegetative cover of grasses and forbs within the proposed solar arrays shall be maximized. 2. Vegetation seeded in these areas shall be comprised of low-growing communities such as native grasslands and wildflower fields, to minimize the effects of vegetation management practices on the revegetated areas. Shrub species shall not be used, as these species would be unable to survive continued vegetation trimming. 3. Under no circumstances shall species identified by the Cal-IPC as invasive weeds be used in the revegetation efforts. 4. To promote the growth of local, native plant species, the top 2-6 inches of topsoil removed during Project-related ~~ground clearing~~ grading and/or excavation shall be stockpiled and spread across disturbance zones after completion of construction in the area. 5. To ensure that a seed supply is maintained to perpetuate on-site vegetation (e.g., annual grasses and wildflowers), vegetation shall be allowed to grow to a maximum height of 18 inches between February 1 and approximately mid-April prior to mowing to a height of 6 inches (or less) by May 1 (through the following January) as required by the LACFD. 6. Herbicides shall be approved for use by the County, and herbicide application shall be performed by trained personnel who can identify the species to be treated. If herbicide is applied, it shall be applied during dry and low wind conditions	

TABLE 2-1 (CONTINUED)
SUMMARY OF ENVIRONMENTAL IMPACTS, MITIGATION MEASURES, AND RESULTING LEVELS OF SIGNIFICANCE

Environmental Impact Summary			
Project Site	Off-site Transmission	Mitigation Measures	Resulting Level of Significance
		in order to prevent herbicide drift into non-target areas. • Within the proposed infiltration basins, no suitable on-site mitigation opportunities exist. However, the HEVMP shall ensure the following: 1. If herbicides are used as approved by LACDRP to control vegetation (i.e., non-native vegetation), they shall be applied by a qualified individual and in a manner consistent with the product labeling. Under no circumstances shall herbicides be allowed to pass into any ephemeral drainage. 2. Under no circumstances shall forb species identified by Cal-IPC as invasive weeds be allowed to thrive in the infiltration basins, or as required by LACFD. Cover of these species, collectively, shall be maintained at or below five percent. • Within all portions of the transmission line route to be impacted during installation of transmission line poles and temporary stringing sites, the HEVMP shall ensure the following: 1. Under no circumstances shall ground disturbance occur within 25 feet of an existing Joshua tree. In applicable areas, Joshua tree avoidance zones shall be delineated with high-visibility construction fencing. 2. All areas of temporary ground disturbance shall be revegetated with appropriate plant communities native to the Project region, such as native grasslands, wildflower fields, desert scrub, rabbitbrush scrub, desert saltbush scrub, and Joshua tree woodland.	

TABLE 2-1 (CONTINUED)
SUMMARY OF ENVIRONMENTAL IMPACTS, MITIGATION MEASURES, AND RESULTING LEVELS OF SIGNIFICANCE

Environmental Impact Summary			
Project Site	Off-site Transmission	Mitigation Measures	Resulting Level of Significance
		3. Where impacts would occur in existing agricultural lands outside the Applicant's ownership, it is presumed that agricultural practices would resume after completion of construction. Therefore, revegetation shall not be required in these areas. 4. If earthwork is proposed in areas where native vegetation exists, the top 2-6 inches of topsoil removed during Project-related ground clearing shall be stockpiled and spread across disturbance zones after completion of construction in the area. 5. Under no circumstances shall species identified by the Cal-IPC as invasive weeds be used in the revegetation efforts. 6. The HEVMP shall include provisions to minimize the effects of transmission line maintenance on biological resources, including a requirement that no Joshua trees shall be removed during such maintenance. In addition to the location-specific requirements set forth above, the HEVMP shall also ensure that the following standards are met or exceeded within the Project site as a whole: 1. The HEVMP shall identify appropriate locations for creation of rabbitbrush scrub, California annual grassland, and wildflower fields, the three most abundant existing natural communities on-site, within avoided portions of the Project site. In total, 101 acres of on-site mitigation shall be provided. 2. Performance monitoring of the on-site enhancement and revegetation areas shall be monitored approximately quarterly, in	

TABLE 2-1 (CONTINUED)
SUMMARY OF ENVIRONMENTAL IMPACTS, MITIGATION MEASURES, AND RESULTING LEVELS OF SIGNIFICANCE

Environmental Impact Summary			
Project Site	Off-site Transmission	Mitigation Measures	Resulting Level of Significance
		January, April, June, and November, and a report detailing the monitoring results shall be submitted to the LACDRP annually. Monitoring and reporting shall be required for a period of five years and until such time as performance standards are achieved. The HEVMP shall contain contingency measures identifying corrective actions required in the event that the performance standards are not met. 3. All percent cover standards shall be evaluated during the spring biomass peak. 4. Anti-coagulant rodenticides shall not be used within the Project site or along the proposed transmission line route. The HEVMP shall be submitted to the LACDRP for review and approval prior to issuance of a grading permit. MM 5.7-2: Off-site Mitigation for Loss of Habitat. Within one year of Project approval or prior to the installation of 50 MW of photovoltaic solar panels, the Applicant shall provide a minimum of 450 acres of off-site mitigation land to be restored, enhanced, and maintained according to the requirements of this mitigation measure, and shall be preserved as open space in perpetuity. Within 45 days of acquiring the mitigation land(s), the Applicant shall record a permanent deed restriction on the mitigation land(s) to be preserved as open space. The deed restriction language shall be submitted to LACDRP for review and approval prior to recordation. Alternatively, should a conservation easement on the mitigation land(s) be offered, the permanent conservation easement(s) shall be recorded to the satisfaction of LACDRP. The off-site mitigation land shall not exceed 10 separate fragments and	

TABLE 2-1 (CONTINUED)
SUMMARY OF ENVIRONMENTAL IMPACTS, MITIGATION MEASURES, AND RESULTING LEVELS OF SIGNIFICANCE

Environmental Impact Summary			
Project Site	Off-site Transmission	Mitigation Measures	Resulting Level of Significance
		shall be acquired adjacent to existing public lands, or within or adjacent to SEAs within the Antelope Valley or surrounding foothills. At least 225 acres of the mitigation land shall be acquired in the vicinity of the Antelope Valley California Poppy Reserve, including lands in or adjacent to SEA #57, or lands connecting the Poppy Reserve to the Angeles National Forest. An additional 75 acres shall be acquired within this same area, or in or adjacent to SEA #60, or adjacent to the Arthur B. Ripley Woodland State Park. The Applicant shall establish a fund sufficient for the restoration, enhancement, and maintenance of the mitigation land(s) until such time when the mitigation land(s) become self-sustained and meet the requirements of this mitigation measure. The fund shall be established within 90 days of mitigation land(s) acquisition in an amount acceptable to the LACDRP. The selected off-site mitigation lands shall contain vegetation communities similar to those found within the Project site, including rabbitbrush scrub, annual grassland, and wildflower fields. Although the proposed Project would not significantly impact Joshua tree woodland habitat, lands containing this vegetation community shall also be considered desirable due to the County's concern over the continuing loss and degradation of Joshua tree woodlands. The selected lands shall comply with the following mitigation requirements: 1. The subject property shall be located within the greater Project vicinity, generally defined to include the Antelope Valley and surrounding foothills. 2. The subject property(s) shall contain a minimum of 450 acres of	

TABLE 2-1 (CONTINUED)
SUMMARY OF ENVIRONMENTAL IMPACTS, MITIGATION MEASURES, AND RESULTING LEVELS OF SIGNIFICANCE

Environmental Impact Summary			
Project Site	Off-site Transmission	Mitigation Measures	Resulting Level of Significance
		land, which shall be either comprised of vegetation communities characteristic of the Antelope Valley (rabbitbrush scrub, annual grassland, wildflower fields, and/or Joshua tree woodlands) or be reasonably capable of being enhanced and converted to such habitat through the use of maintenance and management practices such that the resulting habitat values would be greater than those lost as a result of Project implementation. 3. The subject property(s) shall either contain a minimum of 224.5 acres of wildflower field, or shall be reasonably capable of being enhanced and converted to this vegetation through maintenance and management practices. 4. The subject property(s) shall provide at least 39 acres of contiguous suitable foraging habitat for the burrowing owl, including presence of suitable burrows. If suitable natural burrows are not present within the subject property, artificial burrows shall be constructed in accordance with California Burrowing Owl Consortium (1993) guidelines. 5. The subject property(s) shall contain a minimum of 450 acres of suitable foraging habitat for grassland/scrubland bird species occurring in the Antelope Valley. 6. The subject property(s) shall contain habitat suitable for the Blainville's horned lizard. Within the mitigation site, suitable locations shall be identified for relocation of horned lizards captured and removed from the Project site pursuant to Mitigation Measure 5.7-7. Generally, it is presumed that the wildflower field areas required by item (3) above will be suitable for this species.	

TABLE 2-1 (CONTINUED)
SUMMARY OF ENVIRONMENTAL IMPACTS, MITIGATION MEASURES, AND RESULTING LEVELS OF SIGNIFICANCE

Environmental Impact Summary			
Project Site	Off-site Transmission	Mitigation Measures	Resulting Level of Significance
		7. Under no circumstances shall species identified by the Cal-IPC as invasive weeds be used in revegetation efforts. 8. The subject property(s) shall be maintained such that ~~non-native~~ invasive forbs (as identified by the Cal-IPC) shall not exceed 5 percent of the vegetative cover. Within 60 days of recordation of the permanent deed restriction(s) or conservation easement(s), a Restoration, Enhancement, and Maintenance Plan for the off-site mitigation land(s) shall be submitted to LACDRP for review and approval. The plan shall include the restoration, enhancement, and maintenance requirements for each mitigation area, based on the characteristics of the mitigation land and the mitigation requirements described above, and shall also include contingency measures in the event that habitat creation/restoration/ enhancement efforts are not successful. The Restoration, Enhancement, and Maintenance Plan shall also describe the performance standards for determining when the mitigation requirements for the lands have been met. In addition to meeting the requirements detailed above, the following desirable factors shall also be considered when selecting off-site mitigation property(s): 1. Lands located between blocks of protected habitat are desirable locations for off-site mitigation, as protecting these areas can ensure that essential habitat connections remain in perpetuity. 2. Lands containing Joshua tree woodland habitat are desirable locations for off-site mitigation, due to the continuing loss and degradation of this resource.	

TABLE 2-1 (CONTINUED)
SUMMARY OF ENVIRONMENTAL IMPACTS, MITIGATION MEASURES, AND RESULTING LEVELS OF SIGNIFICANCE

Environmental Impact Summary			
Project Site	Off-site Transmission	Mitigation Measures	Resulting Level of Significance
		3. Lands containing junipers are also desirable locations for off-site mitigation, due to the nesting habitat they may provide for some special-status bird species. 4. Lands containing important landscape features, sensitive habitats, or listed species are desirable locations for off-site mitigation, due to the sensitivity of these resources and the general understanding that such elements are indicative of high biological value.	

TABLE 2-1 (CONTINUED)
SUMMARY OF ENVIRONMENTAL IMPACTS, MITIGATION MEASURES, AND RESULTING LEVELS OF SIGNIFICANCE

Environmental Impact Summary			
Project Site	Off-site Transmission	Mitigation Measures	Resulting Level of Significance
potentially injured or killed during construction ground-disturbance activities. Operational impacts include risk of mortality by vehicles and disturbance on access roads from workers. Additionally, the PV panels, similar to the existing onsite shrubs, may provide perching opportunities for ravens, which are known to prey on juvenile and adult Blainville's horned lizards. Project implementation will result in temporary loss of habitat from construction disturbance and permanent loss of habitat due to permanent structures, roads, fuel modification, shading effects, and alteration of food sources.		appropriate methods that would not injure the wildlife. The biological monitor shall have the authority to stop specific grading or construction activities if violations of mitigation measures or any local, state, or federal laws are suspected. MM 5.7-6: Worker Environmental Education Program. A Worker Environmental Education Program shall be developed for construction crews by a qualified biologist(s) provided by the Applicant. Training materials and briefings shall include but not be limited to: discussion of the value and identification of special-status species, including the burrowing owl and desert tortoise, review of sensitive species likely to occur within the construction area, the Migratory Bird Treaty Act and the consequences of non-compliance with this act, a contact person in the event of the discovery of dead or injured wildlife, and a review of mitigation requirements. The training sessions shall be conducted by a qualified biologist or other individual approved by the biologist. Maps showing the location of special-status wildlife or other construction limitations shall be provided to the environmental monitors and construction crews prior to construction activities. As part of the environmental training, contractors and heavy equipment operators shall be provided with photographs or illustrations of expected special-status wildlife species so they will able to identify them, and avoid harming them during construction. MM 5.7-7: Blainville's Horned Lizard Capture and Relocation. Prior to the initiation of ground clearing activities, capture and relocation efforts shall be conducted for the Blainville's horned lizard to the satisfaction of LACDRP. Trapping shall be conducted by a County-	Less than significant

TABLE 2-1 (CONTINUED)
SUMMARY OF ENVIRONMENTAL IMPACTS, MITIGATION MEASURES, AND RESULTING LEVELS OF SIGNIFICANCE

Environmental Impact Summary			
Project Site	Off-site Transmission	Mitigation Measures	Resulting Level of Significance
		approved biologist possessing proper scientific collection and handling permits, and shall include the following steps: • Prior to initiating the capture and relocation effort, a suitable receptor location shall be identified to receive relocated horned lizards. The receptor locations shall contain suitable habitat for this species, including open, shrub-dominated vegetation. The 45-acre avoidance area near the southern edge of the Project site likely constitutes a suitable on-site receptor location. • The capture and relocation effort shall take place during the ~~spring~~ active season (April through ~~May~~ October) preceding commencement of ground disturbance activities, when lizards are ~~at peak activity~~ most likely to be active. Surveys shall be conducted when air temperature immediately above the ground surface is between 70°F (21°C) and 102°F (39°C). All areas proposed for temporary or permanent ground disturbance shall be surveyed for the Blainville's horned lizard. • Surveys shall be conducted by placing coverboards on the ground 4 to 6 weeks in advance of the survey effort, and checking the area under the coverboards for horned lizards on a weekly basis. Coverboards can consist of untreated lumber, sheet metal, corrugated steel, or other flat material. Captured lizards shall be placed immediately into containers containing sand or moist paper towels and released in designated receptor locations no more than three hours after capture. • If the biologist believes there is high potential for previously	

TABLE 2-1 (CONTINUED)
SUMMARY OF ENVIRONMENTAL IMPACTS, MITIGATION MEASURES, AND RESULTING LEVELS OF SIGNIFICANCE

Environmental Impact Summary			
Project Site	Off-site Transmission	Mitigation Measures	Resulting Level of Significance
the desert kit fox is not a special-status taxon, these impacts would be less than significant.	not a special-status taxon, these impacts would be less than significant.	for three consecutive nights using a tracking medium (such as diatomaceous earth or fire clay) and/or infrared camera stations at the entrance. If no tracks are observed in the tracking medium or no photos of the target species are captured after three nights, the den shall be excavated and backfilled by hand to prevent reuse. If tracks are observed, the den shall be progressively blocked with natural materials (rocks, dirt, sticks, and vegetation piled in front of the entrance) for the next three to five nights to discourage the kit fox from continuing to use the den. After verification that the den is unoccupied, it shall then be excavated and backfilled by hand to prevent reuse, while ensuring that no kit fox are trapped in the den. The Applicant shall submit a report to the LACDRP and CDFG within 30 days of completion of the kit fox surveys describing the survey methods, results, and details of any dens backfilled or foxes observed.	Less than significant
The Project construction and operation is not expected to result in any potentially significant impacts to desert tortoise based on biological surveys performed, agency consultation, known distribution, and lack of suitable habitat at the Project site. Mitigation is proposed as a precautionary measure to further lessen the probability of the Project resulting in impacts to desert tortoise.	Transmission line construction and operation is not expected to result in any potentially significant impacts to desert tortoise based on biological surveys performed, agency consultation, known distribution, and lack of suitable habitat along the transmission line route. Mitigation is proposed as a precautionary measure to further lessen the probability of the Project resulting in impacts to desert tortoise.	MM 5.7-13: Pre-construction Desert Tortoise Surveys. Within 30 days prior to construction-related initial ground clearing and/or grading, the Applicant shall retain a qualified biologist to conduct surveys for signs of occupancy by the desert tortoise. Surveys shall be conducted on foot, and intended to detect any live tortoises or their carcasses, burrows, palates, tracks, or scat. Should any desert tortoise sign indicating the presence of desert tortoise be detected, the Applicant shall not proceed with ground clearing and/or grading activities in the area of the find and shall contact the USFWS and CDFG to develop an avoidance strategy. The results of the pre-construction surveys, including graphics showing the locations of any tortoise sign detected, and documentation of any	Less than significant

TABLE 2-1 (CONTINUED)
SUMMARY OF ENVIRONMENTAL IMPACTS, MITIGATION MEASURES, AND RESULTING LEVELS OF SIGNIFICANCE

Environmental Impact Summary			
Project Site	Off-site Transmission	Mitigation Measures	Resulting Level of Significance
		avoidance measures taken, shall be submitted to the USFWS, CDFG, and LACDRP within 14 days of completion of the pre-construction surveys or construction monitoring to document compliance with applicable federal and state laws pertaining to the protection of desert tortoise.	
The Project site is not located within an area identified as a large-scale habitat linkage, and movement through the site by terrestrial wildlife is somewhat constrained by the presence of 2 paved roadways, SR-138 and 170th Street West, which bisect the site traveling east-west and north-south, respectively. However, small and medium-sized wildlife are known to move through the site. The proposed Project design includes wildlife permeable fencing interspersed with chain-link fencing in order to allow for wildlife movement within and around the site. As a result, impacts to wildlife movement would be less than significant.	Construction of the transmission line would require use of small, isolated patches of disturbance with ample undisturbed habitat between. Construction and operation of the transmission line would not substantially affect the movement of wildlife along the transmission line. Less than significant impacts are expected.	Project fencing is designed to allow passage of wildlife. No mitigation measures are recommended.	Less than significant
The Project site is not located within an SEA boundary; therefore, the Project would not cause significant direct	The transmission line route is not located within an SEA boundary; therefore, the transmission line would	MM 5.6-2: (Develop and Implement Fugitive Dust Emission Control Plan). MM 5.7-11: Facility Lighting.	Less than significant

TABLE 2-1
SUMMARY OF ENVIRONMENTAL IMPACTS, MITIGATION MEASURES, AND RESULTING LEVELS OF SIGNIFICANCE

Environmental Impact Summary			
Project Site	Off-site Transmission	Mitigation Measures	Resulting Level of Significance
The Project site is not located within a plan-designated scenic vista. The Project vicinity contains several scenic features, but also has substantial areas of agricultural uses, presence of infrastructure, and rural residences. As a result, the Project area is considered to have a moderate level of visual quality. Due to the low to moderate profile of construction and operation equipment and structures, as well as the visual characteristics of the Project, the Project is expected to result in less than significant impacts to this criterion.	The transmission line is not located within a plan-designated scenic vista. Similar to the facility site, the transmission line is located in an area of moderate visual quality. The transmission line construction and operation effects would not dominate views, and in conjunction with a low viewer exposure, would not result in significant impacts to this criterion.	No mitigation is proposed or is required.	Less than significant
TRAFFIC AND ACCESS			
The Project construction and operation traffic was determined to result in less than significant impacts to the study area roadway and intersection LOS, and the Project is not anticipated to require additional turn lanes. Construction of utility crossing of SR-138 and 170th Street West (i.e., 34.5 kV electric line over SR-138; and 34.5 kV lines across 170th Street West from the east side to the proposed on-site	The transmission line construction and operation traffic was determined to result in less than significant impacts. Construction envelope to erect transmission poles may require work on public ROW and/or adjacent private properties. If there is insufficient area to work, construction may encroach beyond roadway shoulders (i.e., into traveled roadway) requiring limited closures of roadway	MM 5.11-1: Provide Adequate Worksite Traffic Control. Prior to any construction activities and/or issuance of required encroachment permits from Caltrans and Los Angeles and Kern counties, the Applicant shall prepare worksite traffic control plans for review and approval from Caltrans, the LACDPW and the Kern County Resource Management Agency, Roads Department. The plans shall include: 1) the location and usage of appropriate construction work warning signs that shall be placed in accordance with the California Manual on Uniform Traffic Control ~~Devises~~ Devices (Caltrans 2010); 2) proper merging taper and/or shifting lane schematics; and 3) adequate work area and buffer zone designation as well as proper location and	Less than significant

TABLE 2-1 (CONTINUED)
SUMMARY OF ENVIRONMENTAL IMPACTS, MITIGATION MEASURES, AND RESULTING LEVELS OF SIGNIFICANCE

Environmental Impact Summary			
Project Site	Off-site Transmission	Mitigation Measures	Resulting Level of Significance
substation on the west side) may potentially encroach into the traveled roadway causing short-duration traffic impacts. The proposed water line crossing of SR-138 is expected to not require any traffic control or create delays as sufficient work area exists on the Project site area to perform the subsurface crossing (via jack and bore), and traffic could continue in both directions unimpeded.	segments in the construction zones.	conduct of flagmen and the traffic management supervisor at the installation worksite area. The Project worksite traffic control plans shall be coordinated with driver and worker safety in mind. Where the observed speed limit on affected roadways is 55 MPH or more, the plans shall incorporate and implement the following minimum standard requirements per the Work Area Traffic Control Handbook (WATCH): • A Type C flashing arrow pane shall be used for each closed lane. • The minimum height for traffic cones shall be 28 inches. • A minimum of three advance warning signs shall be posted. • Consideration of advanced safety enhancement measures shall be taken into account for workers in the work zones. The above safety and traffic control measures identified in the traffic control plans shall also be implemented at pole installation sites within the public road ROW and/or roadway crossings at a minimum. Additionally, the County, including the LACFD Fire Stations 78, 112, and 140 shall be notified at least three days in advance of any street closures that may affect fire and/or paramedic responses in the area. Applicant shall provide alternate route (detour) plans to the County, including three sets to the LACFD, with a tentative schedule of planned closures, prior to the beginning of construction. MM 5.11-3: Limit 50 Percent of Truck Deliveries to Off-Peak Hours. During the construction phase of the Project, Applicant/EPC contractor shall require equipment and material suppliers using trucks to make deliveries to the Project site such that at least 50 percent of associated truck traffic occurs during off-peak hours.	

5.7.5 Mitigation Measures

Multiple potentially significant impacts to biological resources have been identified (see Section 5.7.3 above). The following feasible mitigation measures are proposed to avoid or substantially lessen these impacts, as required by the CEQA statute and Guidelines.

As described in Sections 5.7.2.2.4 and 5.7.4.7 as well as Appendix E (Biota Report), based on biological surveys, literature review, and consultation with the USFWS (Bransfield 2009) and CDFG, the desert tortoise is unlikely to occur within the Project site and proposed transmission line route due to known distribution and lack of suitable habitat. The impact assessment did not identify any potentially significant Project impacts to desert tortoise. However, as an added precaution, Mitigation Measure 5.7-13, which involves pre-construction surveys for this species is included, as recommended by the USFWS. This measure would ensure that this species is avoided, and would further lessen the probability of the Project resulting in impacts to the desert tortoise.

Mitigation Measure (MM) 5.7-1: Habitat Enhancement and Vegetation Management Plan. Prior to issuance of a grading permit, the Project Applicant shall develop a Habitat Enhancement and Vegetation Management Plan (HEVMP) to compensate for impacts to existing vegetation communities by preserving and enhancing the remaining vegetation within the Project site. The HEVMP shall also provide measures to ensure minimal impacts to habitat along the off-site transmission line. In areas suitable for on-site mitigation, the HEVMP shall identify appropriate mitigation objectives, standards, and monitoring/reporting requirements to enhance habitat such that the resulting habitat values would be greater than those lost as a result of project implementation. These habitat values would include nesting and foraging habitat for songbirds, foraging habitat for raptors and owls, and high diversity and abundance of native forbs/wildflowers. In areas rendered unsuitable for mitigation due to proposed development, the HEVMP shall identify appropriate restrictions, such as limiting noxious weeds, but shall not impose mitigation standards. The HEVMP shall be prepared by a qualified restoration biologist experienced with desert habitat restoration, and shall specify appropriate revegetation and management practices for the following portions of the Project site to the satisfaction of LACDRP:

- Mitigation and Avoidance Areas (refer to Figure 5.7-11 of this DEIR):

  1. Drainage A, a 100-foot setback, and the associated wildlife travel route (47.1 acres)
  2. Drainage B and a 20-foot buffer (approximately 6 acres)
  3. The southernmost portion of the Project site along Drainage C, where no development is proposed (45 acres)
  4. The Joshua tree recruitment area (8.6 acres, including buffer)

- Areas of Modified/Impacted Habitat (Unsuitable for Mitigation):

  1. All portions of the site within the fire breaks (217 acres)
  2. All interior portions of the site within the proposed solar arrays, excluding locations of proposed infiltration basins and fire breaks (1,336 acres)
  3. All portions of the site to be occupied by proposed infiltration basins (253 acres)

In general, for each of the locations enumerated above, the HEVMP shall specify, at a minimum, the following (specific details vary depending on location, and are described in the paragraphs that follow):

- The location and extent of any on-site enhancement/revegetation areas, to be depicted graphically on an aerial photograph or schematic of appropriate scale
- The quantity and species of plants to be seeded (if necessary), including the locations where each type of vegetation would be created
- A schedule and action plan to maintain and monitor the enhancement/revegetation areas
- A list of success criteria (e.g., growth, plant cover, plant/wildlife diversity) by which to measure success of the enhancement/revegetation effort
- Contingency and/or adaptive management measures in the event that enhancement/ revegetation efforts are not successful

In addition, the standards and practices set forth in the HEVMP for each area shall conform to the requirements stated below:

- Within the setback zones surrounding Drainage A, Drainage B, and Drainage C the HEVMP shall provide for 101 acres of on-site mitigation, as well as 6 acres of additional avoidance area (due to its small and isolated nature, the 6-acre area surrounding Drainage B is not included as suitable mitigation land, but would nonetheless be avoided), and shall ensure the following:

  1. Drainages A, B, and C, including adjacent buffer areas shown on Figures 5.7-7 and 5.7-11, as well as the local wildlife travel route associated with Drainage A, shall be set aside, preserved, and enhanced, and no Project-related disturbance shall be permitted in these areas.
  2. Any anthropogenic discontinuities in the existing vegetation (unofficial roads, dump sites, etc.) within the ephemeral drainage setbacks shall be remedied, and such areas shall be seeded with native plant species characteristic of the surrounding vegetation.

3. Vegetative cover in herbaceous communities (grasslands, wildflower fields) shall exceed 95 percent; of this, ~~non-native~~ invasive forbs (as identified by the Cal-IPC) shall not exceed five percent cover. Bare ground shall not exceed five percent excluding bare ground located within the channel bottom of an ephemeral drainage or bare ground where there is clear evidence that the bare ground was the result of mammal activity (burrows, wildlife trails, etc.).
4. Vegetative cover in shrub-dominated communities (desert saltbush scrub, rabbitbrush scrub) shall exceed 90 percent, and shrub cover shall exceed 30 percent. ~~Non-native~~ Invasive forbs and shrubs combined shall not exceed five percent cover, and bare ground shall not exceed five percent excluding bare ground located within the channel bottom of an ephemeral drainage or bare ground where there is clear evidence that the bare ground was caused by mammal activity (burrows, wildlife trails, etc.).
5. In Drainages A and C and the adjacent setback/buffer areas as shown on Figure 5.7-7, vegetation in the area shall remain suitable for foraging by burrowing owls and other grassland bird species. Habitat enhancement/revegetation shall be implemented if necessary to ensure continued suitability.
6. Joshua trees and junipers shall be planted, to improve habitat suitability for sensitive bird species and increase the likelihood that these areas will be occupied by such special-status species as loggerhead shrikes and long-eared owls.

- Within the Joshua tree recruitment area, the HEVMP shall provide 8.6 acres of mitigation land, and shall ensure the following:

1. The Joshua tree recruitment area and a 50-foot buffer from the Joshua tree seedlings shall be set aside and preserved, and no Project-related disturbance shall be permitted in this area.
2. Any anthropogenic discontinuities in the existing vegetation (other than the County roadbed of West Avenue C, which passes through this area) shall be remedied, and such areas shall be seeded with native plant species characteristic of the surrounding vegetation.
3. Measures shall be implemented to encourage the continued recruitment of Joshua trees into this area. Such measures may include standards for herbaceous and shrub cover, removal of non-native plants and wildlife, and others.
4. To provide nesting and perching habitat and increase structural diversity within restoration areas, native shrub species associated with Joshua tree woodland (including Mojave yucca, sage, box-thorn, and buckwheat, as noted in the County General Plan) shall be included in the planting palette.

- Within the proposed fire breaks, no suitable on-site mitigation opportunities exist. However, the HEVMP shall ensure the following:

  1. To prevent the potential spread of fire onto the Project site, the proposed fire breaks shall be maintained clear of vegetative cover through mechanical clearing and selective herbicide use.
  2. If herbicides are used as approved by LACDRP to control vegetation, they shall be applied by a qualified individual and in a manner consistent with the product labeling. Under no circumstances shall herbicides be allowed to pass into any ephemeral drainage.
  3. Under no circumstances shall forb species identified by the California Invasive Plant Council (Cal-IPC) as invasive weeds be allowed to thrive in the fire breaks, or as required by LACFD. Cover of these species, collectively, shall be maintained at or below five percent.

- Within all interior portions of the site within and adjacent to the proposed solar arrays, excluding locations of proposed infiltration basins, no suitable on-site mitigation opportunities would exist. However, the HEVMP shall ensure the following:

  1. To control fugitive dust, vegetative cover of grasses and forbs within the proposed solar arrays shall be maximized.
  2. Vegetation seeded in these areas shall be comprised of low-growing communities such as native grasslands and wildflower fields, to minimize the effects of vegetation management practices on the revegetated areas. Shrub species shall not be used, as these species would be unable to survive continued vegetation trimming.
  3. Under no circumstances shall species identified by the Cal-IPC as invasive weeds be used in the revegetation efforts.
  4. To promote the growth of local, native plant species, the top 2-6 inches of topsoil removed during Project-related ~~ground clearing and/or~~ grading and/or excavation shall be stockpiled and spread across disturbance zones after completion of construction in the area.
  5. To ensure that a seed supply is maintained to perpetuate on-site vegetation (e.g., annual grasses and wildflowers), vegetation shall be allowed to grow to a maximum height of 18 inches between February 1 and approximately mid-April prior to mowing to a height of 6 inches (or less) by May 1 (through the following January) as required by the LACFD.
  6. Herbicides shall be approved for use by the County, and herbicide application shall be performed by trained personnel who can identify the species to be treated. If herbicide

is applied, it shall be applied during dry and low wind conditions in order to prevent herbicide drift into non-target areas.

- Within the proposed infiltration basins, no suitable on-site mitigation opportunities exist. However, the HEVMP shall ensure the following:

  1. If herbicides are used as approved by LACDRP to control vegetation (i.e., non-native vegetation), they shall be applied by a qualified individual and in a manner consistent with the product labeling. Under no circumstances shall herbicides be allowed to pass into any ephemeral drainage.
  2. Under no circumstances shall forb species identified by Cal-IPC as invasive weeds be allowed to thrive in the infiltration basins, or as required by LACFD. Cover of these species, collectively, shall be maintained at or below five percent.

- Within all portions of the transmission line route to be impacted during installation of transmission line poles and temporary stringing sites, the HEVMP shall ensure the following:

  1. Under no circumstances shall ground disturbance occur within 25 feet of an existing Joshua tree. In applicable areas, Joshua tree avoidance zones shall be delineated with high-visibility construction fencing.
  2. All areas of temporary ground disturbance shall be revegetated with appropriate plant communities native to the Project region, such as native grasslands, wildflower fields, desert scrub, rabbitbrush scrub, desert saltbush scrub, and Joshua tree woodland.
  3. Where impacts would occur in existing agricultural lands outside the Applicant's ownership, it is presumed that agricultural practices would resume after completion of construction. Therefore, revegetation shall not be required in these areas.
  4. If earthwork is proposed in areas where native vegetation exists, the top 2-6 inches of topsoil removed during Project-related ground clearing shall be stockpiled and spread across disturbance zones after completion of construction in the area.
  5. Under no circumstances shall species identified by the Cal-IPC as invasive weeds be used in the revegetation efforts.
  6. The HEVMP shall include provisions to minimize the effects of transmission line maintenance on biological resources, including a requirement that no Joshua trees shall be removed during such maintenance.

In addition to the location-specific requirements set forth above, the HEVMP shall also ensure that the following standards are met or exceeded within the Project site as a whole:

1. The HEVMP shall identify appropriate locations for creation of rabbitbrush scrub, California annual grassland, and wildflower fields, the three most abundant existing natural communities on-site, within avoided portions of the Project site. In total, 101 acres of on-site mitigation shall be provided.
2. Performance monitoring of the on-site enhancement and revegetation areas shall be monitored approximately quarterly, in January, April, June, and November, and a report detailing the monitoring results shall be submitted to the LACDRP annually. Monitoring and reporting shall be required for a period of five years and until such time as performance standards are achieved. The HEVMP shall contain contingency measures identifying corrective actions required in the event that the performance standards are not met.
3. All percent cover standards shall be evaluated during the spring biomass peak.
4. Anti-coagulant rodenticides shall not be used within the Project site or along the proposed transmission line route.

The HEVMP shall be submitted to the LACDRP for review and approval prior to issuance of a grading permit.

MM 5.7-2: Off-site Mitigation for Loss of Habitat. Within one year of Project approval or prior to the installation of 50 MW of photovoltaic solar panels, the Applicant shall provide a minimum of 450 acres of off-site mitigation land to be restored, enhanced, and maintained according to the requirements of this mitigation measure, and shall be preserved as open space in perpetuity. Within 45 days of acquiring the mitigation land(s), the Applicant shall record a permanent deed restriction on the mitigation land(s) to be preserved as open space. The deed restriction language shall be submitted to LACDRP for review and approval prior to recordation. Alternatively, should a conservation easement on the mitigation land(s) be offered, the permanent conservation easement(s) shall be recorded to the satisfaction of LACDRP.

The off-site mitigation land shall not exceed 10 separate fragments and shall be acquired adjacent to existing public lands, or within or adjacent to SEAs within the Antelope Valley or surrounding foothills. At least 225 acres of the mitigation land shall be acquired in the vicinity of the Antelope Valley California Poppy Reserve, including lands in or adjacent to SEA #57, or lands connecting the Poppy Reserve to the Angeles National Forest. An additional 75 acres shall be acquired within this same area, or in or adjacent to SEA #60, or adjacent to the Arthur B. Ripley Woodland State Park.

The Applicant shall establish a fund sufficient for the restoration, enhancement, and maintenance of the mitigation land(s) until such time when the mitigation land(s) become self-sustained and meet the requirements of this mitigation measure. The fund shall be

established within 90 days of mitigation land(s) acquisition in an amount acceptable to the LACDRP.

The selected off-site mitigation lands shall contain vegetation communities similar to those found within the Project site, including rabbitbrush scrub, annual grassland, and wildflower fields. Although the proposed Project would not significantly impact Joshua tree woodland habitat, lands containing this vegetation community shall also be considered desirable due to the County's concern over the continuing loss and degradation of Joshua tree woodlands. The selected lands shall comply with the following mitigation requirements:

1. The subject property shall be located within the greater Project vicinity, generally defined to include the Antelope Valley and surrounding foothills.
2. The subject property(s) shall contain a minimum of 450 acres of land, which shall be either comprised of vegetation communities characteristic of the Antelope Valley (rabbitbrush scrub, annual grassland, wildflower fields, and/or Joshua tree woodlands) or be reasonably capable of being enhanced and converted to such habitat through the use of maintenance and management practices such that the resulting habitat values would be greater than those lost as a result of Project implementation.
3. The subject property(s) shall either contain a minimum of 224.5 acres of wildflower field, or shall be reasonably capable of being enhanced and converted to this vegetation through maintenance and management practices.
4. The subject property(s) shall provide at least 39 acres of contiguous suitable foraging habitat for the burrowing owl, including presence of suitable burrows. If suitable natural burrows are not present within the subject property, artificial burrows shall be constructed in accordance with California Burrowing Owl Consortium (1993) guidelines.
5. The subject property(s) shall contain a minimum of 450 acres of suitable foraging habitat for grassland/scrubland bird species occurring in the Antelope Valley.
6. The subject property(s) shall contain habitat suitable for the Blainville's horned lizard. Within the mitigation site, suitable locations shall be identified for relocation of horned lizards captured and removed from the Project site pursuant to Mitigation Measure 5.7-7. Generally, it is presumed that the wildflower field areas required by item (3) above will be suitable for this species.
7. Under no circumstances shall species identified by the Cal-IPC as invasive weeds be used in revegetation efforts.
8. The subject property(s) shall be maintained such that ~~non-native~~ invasive forbs (as identified by the Cal-IPC) shall not exceed 5 percent of the vegetative cover.

Within 60 days of recordation of the permanent deed restriction(s) or conservation easement(s), a Restoration, Enhancement, and Maintenance Plan for the off-site mitigation land(s) shall be submitted to LACDRP for review and approval. The plan shall include the restoration, enhancement, and maintenance requirements for each mitigation area, based on the characteristics of the mitigation land and the mitigation requirements described above, and shall also include contingency measures in the event that habitat creation/restoration/ enhancement efforts are not successful. The Restoration, Enhancement, and Maintenance Plan shall also describe the performance standards for determining when the mitigation requirements for the lands have been met.

In addition to meeting the requirements detailed above, the following desirable factors shall also be considered when selecting off-site mitigation property(s):

1. Lands located between blocks of protected habitat are desirable locations for off-site mitigation, as protecting these areas can ensure that essential habitat connections remain in perpetuity.
2. Lands containing Joshua tree woodland habitat are desirable locations for off-site mitigation, due to the continuing loss and degradation of this resource.
3. Lands containing junipers are also desirable locations for off-site mitigation, due to the nesting habitat they may provide for some special-status bird species.
4. Lands containing important landscape features, sensitive habitats, or listed species are desirable locations for off-site mitigation, due to the sensitivity of these resources and the general understanding that such elements are indicative of high biological value.

detected, and any avoidance measures implemented, shall be submitted to the LACDRP and CDFG within 14 days of completion of the surveys to document compliance with applicable state and federal laws pertaining to the protection of native birds. Nesting bird surveys shall be conducted in each of the first five years after Project development. At the end of this period, the results of the first five years of surveys shall be submitted to the LACDRP and CDFG. After submittal of the first five-year survey results, the County of Los Angeles, under consultation with CDFG, shall determine whether or not the nesting bird surveys shall continue.

MM 5.7-5: Biological Monitor. Prior to grading, a qualified biologist shall be retained by the Applicant as the biological monitor subject to the approval of the County of Los Angeles. The biological monitor shall ensure that impacts to biological resources are avoided or minimized to the fullest extent possible. During earth moving activities, the biological monitor shall be present to relocate any vertebrate species that may come into harm's way to undisturbed areas of suitable habitat using appropriate methods that would not injure the wildlife. The biological monitor shall have the authority to stop specific grading or construction activities if violations of mitigation measures or any local, state, or federal laws are suspected.

MM 5.7-6: Worker Environmental Education Program. A Worker Environmental Education Program shall be developed for construction crews by a qualified biologist(s) provided by the Applicant. Training materials and briefings shall include but not be limited to: discussion of the value and identification of special-status species, including the burrowing owl and desert tortoise, review of sensitive species likely to occur within the construction area, the Migratory Bird Treaty Act and the consequences of non-compliance with this act, a contact person in the event of the discovery of dead or injured wildlife, and a review of mitigation requirements. The training sessions shall be conducted by a qualified biologist or other individual approved by the biologist. Maps showing the location of special-status wildlife or other construction limitations shall be provided to the environmental monitors and construction crews prior to construction activities. As part of the environmental training, contractors and heavy equipment operators shall be provided with photographs or illustrations of expected special-status wildlife species so they will able to identify them, and avoid harming them during construction.

MM 5.7-7: Blainville's Horned Lizard Capture and Relocation. Prior to the initiation of ground clearing activities, capture and relocation efforts shall be conducted for the Blainville's horned lizard to the satisfaction of LACDRP. Trapping shall be conducted by a County-approved biologist possessing proper scientific collection and handling permits, and shall include the following steps:

- Prior to initiating the capture and relocation effort, a suitable receptor location shall be identified to receive relocated horned lizards. The receptor locations shall contain suitable habitat for this species, including open, shrub-dominated vegetation. The 45-acre avoidance area near the southern edge of the Project site likely constitutes a suitable on-site receptor location.
- The capture and relocation effort shall take place during the ~~spring~~ active season (April through ~~May~~ October) preceding commencement of ground disturbance activities, when lizards are ~~at peak activity~~ most likely to be active. Surveys shall be conducted when air temperature immediately above the ground surface is between 70°F (21°C) and 102°F (39°C). All areas proposed for temporary or permanent ground disturbance shall be surveyed for the Blainville's horned lizard.
- Surveys shall be conducted by placing coverboards on the ground 4 to 6 weeks in advance of the survey effort, and checking the area under the coverboards for horned lizards on a weekly basis. Coverboards can consist of untreated lumber, sheet metal, corrugated steel, or other flat material. Captured lizards shall be placed immediately into containers containing sand or moist paper towels and released in designated receptor locations no more than three hours after capture.
- If the biologist believes there is high potential for previously relocated lizards to return to the impact sites following relocation, silt fence shall be installed to prevent relocated individuals from reoccupying areas proposed for disturbance.

MM 5.7-8: Pre-construction Nesting Bird Surveys. Within 30 days prior to vegetation clearing or ground disturbance associated with construction or grading that would occur during the nesting/breeding season of native bird species potentially nesting on the site (typically February through August in the project region, or as determined by a qualified biologist), the Applicant shall have weekly surveys conducted by a qualified biologist to determine if active nests of special-status bird species, or of any bird species protected by the Migratory Bird Treaty Act or the California Fish and Game Code, are present in the disturbance zone or within 300 feet (500 feet for raptors) of the disturbance zone. The surveys shall occur on a weekly basis, with the last survey being conducted no more than seven days prior to initiation of disturbance work. If ground disturbance activities are delayed, then additional pre-disturbance surveys shall be conducted such that no more than seven days will have elapsed between the survey and ground disturbance activities. The Applicant or contractor shall provide the biologist with plans detailing the extent of proposed ground disturbance prior to the survey effort.

If active nests are found, clearing and construction within 300 feet of the nest (500 feet for raptors) shall be postponed or halted, until the nest is vacated and juveniles have fledged, as determined by the biologist, and there is no evidence of a second attempt at nesting. Limits of

potentially active dens in areas that would be impacted by construction activities shall be monitored by the biological monitor for three consecutive nights using a tracking medium (such as diatomaceous earth or fire clay) and/or infrared camera stations at the entrance. If no tracks are observed in the tracking medium or no photos of the target species are captured after three nights, the den shall be excavated and backfilled by hand to prevent reuse. If tracks are observed, the den shall be progressively blocked with natural materials (rocks, dirt, sticks, and vegetation piled in front of the entrance) for the next three to five nights to discourage the kit fox from continuing to use the den. After verification that the den is unoccupied, it shall then be excavated and backfilled by hand to prevent reuse, while ensuring that no kit fox are trapped in the den. The Applicant shall submit a report to the LACDRP and CDFG within 30 days of completion of the kit fox surveys describing the survey methods, results, and details of any dens backfilled or foxes observed.

MM 5.7-13: Pre-construction Desert Tortoise Surveys. Within 30 days prior to construction-related initial ground clearing and/or grading, the Applicant shall retain a qualified biologist to conduct surveys for signs of occupancy by the desert tortoise. Surveys shall be conducted on foot, and intended to detect any live tortoises or their carcasses, burrows, palates, tracks, or scat. Should any desert tortoise sign indicating the presence of desert tortoise be detected, the Applicant shall not proceed with ground clearing and/or grading activities in the area of the find and shall contact the USFWS and CDFG to develop an avoidance strategy.

The results of the pre-construction surveys, including graphics showing the locations of any tortoise sign detected, and documentation of any avoidance measures taken, shall be submitted to the USFWS, CDFG, and LACDRP within 14 days of completion of the pre-construction surveys or construction monitoring to document compliance with applicable federal and state laws pertaining to the protection of desert tortoise.

5.7.6 References

Aspen Environmental Group. 2009. Revised Tehachapi Renewable Transmission Project Biological Resources Specialist Report. September, 2009.

Bransfield, Ray. 2009. U.S. Fish and Wildlife Service biologist. E-Mail Message to Crissy Slaughter, URS Corporation biologist, July 9, 2009.

California Burrowing Owl Consortium (CBOC). 1993. Burrowing owl survey protocol and mitigation guidelines.

California Herps. 2009. Range map for Blainville's horned lizard. Accessed online at http://www.californiaherps.com/lizards/pages/p.blainvillii.html.

visitors. However, based on the regional topography, the Project site is not visible from these lakes.

Residential uses in the unincorporated areas in the Project region are generally low density, in isolated or small clusters of rural dwellings. Antelope Acres is a rural community located over 6 miles southeast of the Project site. The community of Neenach is located along SR-138 approximately 8 miles west of the Project site, and includes residential and commercial uses. A number of scattered or clustered rural and agricultural residences are also located along SR-138 between SR-14 and I-5. The scattered agricultural residences are located in the vicinity of active or fallow agricultural areas, and typically include associated agricultural equipment and structures. During site reconnaissance efforts in early 2010, several dwellings along SR-138 were observed to have been abandoned.

The nearest large incorporated city to the Project site is the City of Lancaster. The Project site is located approximately 15 miles northwest of downtown Lancaster. In 2009, the City of Lancaster was the eighth-largest city in Los Angeles County and the sixth fastest growing city in Los Angeles County by numeric growth, with a population of approximately 145,074 people (California Department of Finance 2009).

Other notable regional uses include the AVCPR, Desert Woodland Park, Desert Pines Wildlife Sanctuary, and Edwards Air Force Base. The AVCPR and Desert Woodland Park are part of the California State Park system within the Mojave Sector of the Tehachapi District. The 1,781-acre AVCPR reserve contains roughly 7.4 miles of non-motorized trails that meander throughout the property. Approximately 11,440 users are estimated to utilize the Reserve annually, peaking during the wildflower season, generally from mid-February through mid-May (California State Parks 2009). In addition to the reserve's hiking trails, an interpretive center, interpretive displays, and picnic tables are also available for recreational users. In close proximity to the interpretive center, picnic tables are present offering a view over the south side of the valley towards the Transverse Ranges and the San Gabriel Mountains. The Desert Woodland Park is located 2.5 miles southwest of the Project site, at its nearest point. The Park comprises a 566-acre area of native Joshua trees and junipers. The trail is predominantly internal to the Park, and offers few views to the east towards the Project site. The Desert Pines Wildlife Sanctuary is a 99-acre County preserve located south of the Arthur B. Ripley Desert Woodland State Park. The Sanctuary is approximately 3 miles southwest at the nearest point from the Project site, on the south side of the California Aqueduct. The Sanctuary contains no facilities or established trails, and provides nature-viewing, hiking, and horseback riding opportunities to the public.

Edwards Air Force Base (AFB), noted for its space shuttle landings, and the Air Force Plant 42 aircraft assembly and testing facility, are substantial industries in the Antelope Valley (LACDRP 2009). Edwards AFB covers 301,000 acres, or roughly 470 square miles, and

5.11.1.2.2 California Vehicle Code, Sections 31303-31309. Requires that the transportation of hazardous materials be on the state or interstate highway that offers the shortest overall transit time possible. The administering agency for the above statutes is the CHP.

5.11.1.2.3 California Vehicle Code, Section 35550. Imposes weight guidelines and restrictions upon vehicles traveling upon freeways and highways. The section holds that "a single axle load shall not exceed 20,000 pounds. The load on any one wheel or wheels supporting one end of an axle is limited to 10,500 pounds. The front steering axle load is limited to 12,500 pounds." Furthermore, CVC Section 35551 defines the maximum overall gross weight as 80,000 pounds and adds that "the gross weight of each set of tandem axles shall not exceed 34,000 pounds." The administering agency for the above statute is the California Department of Transportation (Caltrans).

5.11.1.2.4 California Vehicle Code, Section 35780. Requires a Single-Trip Transportation Permit to transport oversized or excessive loads over state highways. ~~The permit is acquired can be acquired through Caltrans.~~The Project would need to acquire Transportation Permits from Caltrans for transport of any oversize or excessive loads over state highways.

5.11.1.2.5 The California Streets and Highways Code, Sections 660, 670, 672, 1450, 1460, 1470, 1480 et seq. This code defines highways and encroachments, and requires encroachment permits for projects involving excavation in, or aerial crossings over, State Highways and County Roadways. This law is generally enforced at the local level. The administering agencies for this regulation are Caltrans, the Los Angeles County Department of Public Works, and the Kern County Resource Management Agency, Roads Department. The Project would need to apply for encroachment permits for any excavation in, or aerial crossings (e.g., transmission lines) over, state and county roadways prior to construction.

5.11.1.2.6 California Health and Safety Code, Section 25160 et seq. This code addresses the safe transport of hazardous wastes, requires a manifest for hazardous waste shipments, and requires a person who transports hazardous waste in a vehicle to have a valid registration issued by the Department of Toxic Substances Control (DTSC) in their possession while transporting hazardous waste.

5.11.1.2.7 California Manual on Uniform Traffic Control Devices (Ca MUTCD) Section 5-1.1. Requires a temporary traffic control plan be provided for "continuity of function (movement of traffic, pedestrians, bicyclists, transit operations), and access to property/utilities" during any time the normal function of a roadway is suspended.

For the proposed Project, the administering agencies for the above regulation are the Los Angeles County Department of Public Works (LACDPW) and the Kern County Resources Management Agency, Roads Department. If required, the Applicant would file a Traffic

The following mitigation measure is proposed to reduce potential impacts associated with construction of overhead 34.5-kV crossings of SR-138 and 170th Street West and overhead 230-kV crossings of existing and/or designated cross streets (in Los Angeles County: West Avenue C, West Avenue B, West Avenue A12, West Avenue A8, Avenue A4, West Avenue A [County line]; and in Kern County: Kingbird Avenue, Gaskell Road, Patterson Road, and Astoria/Holiday Avenue) as well as the off-site transmission line in the public road ROW along 170th Street West in northern Los Angeles and southern Kern Counties. The mitigation measure provided herein will not require any permanent improvements.

Mitigation Measure (MM) 5.11-1: Provide Adequate Worksite Traffic Control. Prior to any construction activities and/or issuance of required encroachment permits from Caltrans and Los Angeles and Kern counties, the Applicant shall prepare worksite traffic control plans for review and approval from Caltrans, the LACDPW, and the Kern County Resource Management Agency, Roads Department. The plans shall include: 1) the location and usage of appropriate construction work warning signs that shall be placed in accordance with the California Manual on Uniform Traffic Control ~~Devises~~ Devices (Caltrans 2010); 2) proper merging taper and/or shifting lane schematics; and 3) adequate work area and buffer zone designation as well as proper location and conduct of flagmen and the traffic management supervisor at the installation worksite area. The Project worksite traffic control plans shall be coordinated with driver and worker safety in mind. Where the observed speed limit on affected roadways is 55 MPH or more, the plans shall incorporate and implement the following minimum standard requirements per the Work Area Traffic Control Handbook (WATCH):

- A Type C flashing arrow pane shall be used for each closed lane.
- The minimum height for traffic cones shall be 28 inches.
- A minimum of three advance warning signs shall be posted.
- Consideration of advanced safety enhancement measures shall be taken into account for workers in the work zones.

The above safety and traffic control measures identified in the traffic control plans shall also be implemented at pole installation sites within the public road ROW and/or roadway crossings at a minimum.

Additionally, the County, including the LACFD Fire Stations 78, 112, and 140 shall be notified at least three days in advance of any street closures that may affect fire and/or paramedic responses in the area. Applicant shall provide alternate route (detour) plans to the County, including three sets to the LACFD, with a tentative schedule of planned closures, prior to the beginning of construction.

MM 5.11-2: Document Pre-and Post-Project Construction Pavement Condition of 170th Street West and Pay Fair Share. Prior to issuance of a grading permit, Applicant shall document and submit all required information and/or material pertaining to the pavement conditions of 170th Street West including the formula for calculating the Project's fair share of any repair and/or reconstruction of 170th Street West to the satisfaction of the LACDPW. Applicant shall reimburse the County of Los Angeles for the cost of any repairs and/or reconstruction of 170th Street West attributable to the Project as agreed to by the LACDPW. The timing of any necessary repairs and/or reconstruction of 170th Street West and the required payment by Applicant shall be determined by LACDPW.

MM 5.11-3: Limit 50 Percent of Truck Deliveries to Off-Peak Hours. During the construction phase of the Project, Applicant/EPC contractor shall require equipment and material suppliers using trucks to make deliveries to the Project site such that at least 50 percent of associated truck traffic occurs during off-peak hours.

5.11.6 Level of Significance after Mitigation

The proposed Project would not result in any potentially significant long-term operational phase traffic impacts.

With implementation of Mitigation Measures 5.11-1 and 5.11-2 presented above, potential project-related traffic impacts during construction of the AV Solar Ranch One facility (including 34.5-kV lines) and the off-site 230-kV transmission line would be reduced to less than significant levels.

5.11.7 References

American Public Works Association (APWA). 2009. Work Area Traffic Control Handbook (WATCH). APWA – Southern California Chapter.

California Department of Transportation (Caltrans). 2010. California Manual on Uniform Traffic Control Devices. January 21.

2002. Guide for the Preparation of Traffic Impact Studies.

Los Angeles County Department of Public Works (LACDPW). 1987. Traffic Impact Analysis Report Guidelines. Prepared by Donald L. Wolfe.

Los Angeles County Metropolitan Transportation Authority. 2004. Congestion Management Program for Los Angeles County.

Transportation Research Board. 2000. Highway Capacity Manual.

emergency access and regional traffic. While traveling along the Project boundary, travelers would have indirect and direct views of the site (Figures 5.10-4 and 5.10-6). For viewers that are not immediately adjacent to the site, topography, the concentration of agricultural activities, and other similar vegetative screening in the area would block some portions of the site and create partially screened and interrupted views of the site, which are shown on the Project viewshed analysis (Figure 5.10-1A) and simulations (Figures 5.10-9, 5.10-11, and 5.10-13).

The Project site is approximately 1.5 miles northwest of the Antelope Valley California Poppy Reserve, and approximately 2.5 miles northeast of the Arthur B. Ripley Desert Woodland State Park. Most of the areas within both the parks are obstructed from views of the Project site. Areas where the topography provides a more direct view to the Project site were assessed, and the Project simulations shown on Figures 5.10-9 and 5.10-11 provide the representative views that park visitors and trail enthusiasts would experience at the AVCPR and Desert Woodland State Park, respectively, in the event that they are located at a direct viewing location to the site. As shown, the developed Project would be difficult to discern, and would not significantly detract from the existing visual quality.

The Desert Pines Wildlife Sanctuary, which is a 99-acre County preserve located south of the Desert Woodland State Park, is approximately 3 miles from the Project site. Based on the analyses presented in Section 5.10 (Visual Qualities), the proposed Project would have less than significant visual impacts (see Figures 5.10-10 and 5.10-11 in Section 5.10) from the Desert Woodland State Park. Given that the Desert Pines Wildlife Sanctuary is one-half mile farther away from the Project site than the Desert Woodland State Park, the Project would be expected to result in less than significant visual impacts.

As mentioned previously, the Project site vicinity consists of a rural setting, which is further evidenced by the existing Non-Urban 1 (N1) General Plan land use and agricultural zoning (Light Agriculture and Heavy Agriculture) designations assigned to the Project site and surrounding areas. The Project site was formerly used for agricultural production, and current adjacent land uses consist of agricultural uses, open land, scattered residences, an existing SCE high-voltage transmission corridor, SR-138, and 170th Street West. The proposed Project would not result in urbanization of the site. The Project entails solar energy generation using PV technology. The Project would be considered an industrial application due to its production of electricity; however, the facility operates using a passive means of electrical generation, where the PV panels absorb sunlight in order to generate electricity. Unlike conventional power generation methods, the proposed Project would not require combustion or large mechanical processes (for instance, turbines or generators) in order to produce electricity. The Project would also generate minimal air emissions, hazardous materials, and noise, in contrast with many industrial applications.

SECTION 3.0
RESPONSES TO REGIONAL PLANNING COMMISSION HEARING COMMENTS

3.1 INTRODUCTION

This section addresses and provides responses to the proceedings of the County of Los Angeles Regional Planning Commission (RPC) Public Hearing that occurred on June 30, 2010 for the AV Solar Ranch One Project. A summary of each oral comment received from individual members of the public during the RPC Hearing, followed by the associated responses to the oral comments are provided in Section 3.3. Written responses to comments and requests received from the Los Angeles County Regional Planning Commissioners during the Hearing are presented in Section 3.4.

3.2 REGIONAL PLANNING COMMISSION HEARING MINUTES

The RPC Hearing minutes are presented at the end of this section for reference.

3.3 RESPONSES TO ORAL TESTIMONY – REGIONAL PLANNING COMMISSION PUBLIC HEARING ON JUNE 30, 2010

On June 30, 2010, the following four members of the public presented oral testimony at the RPC Hearing on the Project:

- Josh Mann, Antelope Valley Board of Trade
- Mel Layne, Greater Antelope Valley Economic Alliance
- Virginia Stout, Member of Antelope Acres Town Council
- Judy Fuentes, Member of Antelope Acres Town Council

A summary of the comments raised by the individuals, followed by the written responses is presented in the subsequent sections.

3.3.1 Mr. Josh Mann, Antelope Valley Board of Trade

3.3.1.1 <u>Summary of Oral Comment</u>

Mr. Josh Mann, on behalf of the Antelope Valley Board of Trade, spoke in support of the Project, and stated that the AV Solar Ranch Project is complete and appropriate for the needs of the Antelope Valley, based on the Project's site selection, the Project's feasibility, and the

Applicant's involvement in the community. The Project would benefit the region by providing necessary employment opportunities and education opportunities.

3.3.1.2 Response to Oral Comment

This comment expresses support for the Project, but does not raise a specific concern or question regarding the adequacy of the analysis contained in the Draft EIR. Therefore, a response is not required pursuant to CEQA. However, the comment is acknowledged for the record and will be forwarded to the decision-making bodies for their review and consideration.

3.3.2 Mr. Mel Layne, Greater Antelope Valley Economic Alliance

3.3.2.1 Summary of Oral Comment

Mr. Mel Layne, on behalf of the Greater Antelope Valley Economic Alliance, spoke in support of the Project, stating that the Project along with others is very important to enhancing the quality of life for the Antelope Valley citizens. The Alliance is in support of the Project in that the Project will provide jobs, and is a natural progression for the Antelope Valley since farming is no longer viable in the area. Mr. Layne also stated that the technology is environmentally friendly, and that the proposed Project's water use was miniscule compared with farming.

3.3.2.2 Response to Oral Comment

This comment expresses support for the Project, but does not raise a specific concern or question regarding the adequacy of the analysis contained in the Draft EIR. Therefore, a response is not required pursuant to CEQA. However, the comment is acknowledged for the record and will be forwarded to the decision-making bodies for their review and consideration.

3.3.3 Ms. Virginia Stout, Member of Antelope Acres Town Council

3.3.3.1 Summary of Oral Comments

Ms. Virginia Stout is a member of the Antelope Acres Town Council, and expressed the following concerns regarding the Project and the Draft EIR:

- **Draft EIR Availability.** Ms. Stout stated that the Draft EIR was only delivered to the Lancaster Library the day before, on June 29, 2010, and was made available to the public in the afternoon. Therefore, Ms. Stout requests that the Draft EIR comment period be extended.

- **California Poppy Trail.** Ms. Stout stated that the Draft EIR failed to address the California Poppy Trail, near 170th Street. The trail is heavily used by riders, and Ms. Stout requested that the Applicant maintain and dedicate the trail to the County because the trail users would not be able to see the wildflower fields that they are currently riding the trail to see. Instead, they would see solar farms and perhaps racetracks.
- **Desert Pines.** Ms. Stout stated that the Draft EIR failed to address the Desert Pines, which is a 99-acre County native preserve in the area.
- **Bald Eagles.** Ms. Stout stated that the Draft EIR failed to address the bald eagles that are nesting in the area, which have been heavily photographed. The Draft EIR should address where the bald eagles forage and if the Project might reduce their foraging areas.
- **Water Use.** Ms. Stout commented that the Draft EIR identifies that the Project would only use water to wash panels, and requested that the water use associated with the proposed operations and maintenance building which includes a mezzanine, office space, conference room, and 39 parking spaces in the parking area, as well as other uses of the operations and maintenance building be provided. Ms. Stout further asks whether the water use for the operations and maintenance building requires chlorination or needs to be trucked in.
- **Alternative 2.** Ms. Stout requests that Alternative 2 be considered even if it has to be modified.
- **Cumulative Effects with Solar-Wind (Blue-Map) Overlay.** Ms. Stout states that the County applied a blue-map overlay in the Antelope Valley area that directs solar and wind projects to be concentrated in the overlay area, and that the Draft EIR does not identify the cumulative effect from the entire area being covered with solar panels as a result of the overlay.
- **Fencing.** Ms. Stout commented that the proposed 8-foot fence with three-strand barbed wire and trees would block the mountains, and the area would not appear rural, but would look industrial or resemble a prison.
- **Tourism.** Ms. Stout expressed concern that the Project would reduce the number of tourists visiting the area who are the life blood of the area, and claimed that people do not go to the area to visit solar farms. Ms. Stout stated that there are many more solar energy projects coming to the Antelope Valley, and is concerned about the cumulative effects.

3.3.3.2 Response to Oral Comments

The following responses address Ms. Stout's comments:

- **Draft EIR Availability.** Two hardcopy and two electronic (CD) copies of the Draft EIR were sent to the Lancaster Library and three other public libraries (as identified on the

publicly noticed Draft EIR Notice of Availability) in the Project area to provide the public with adequate access to review the Draft EIR. The delivery confirmation records received from the Lancaster Library indicate that both the hardcopy and electronic copies of the Draft EIR were delivered and signed for on the morning of June 15, 2010, which is one day prior to the start of the formal review and comment period.

- **California Poppy Trail.** The California Poppy Trail is a proposed trail that is located on private property. Based on available map data, the proposed trail reaches its closest distance to the Project site approximately 1.5 miles to the south (from the east, the Antelope and Fairmont Butte becomes a barrier between the trail and the proposed Project site), which would constitute a middle-ground view of the site. KOP #3 of the Draft EIR (Draft EIR Section 5.10, Visual Qualities) provides comparable views of the appearance of the site from the proposed trail, and would be expected to result in less than significant impacts. Without property owner consent, trail users would be trespassing; thus, it cannot be assumed that all members of the public have access to the trail. Because this is a proposed trail on private property, and is not available for use by the general public, this trail is not considered a regional riding or hiking trail, and is not included in the Draft EIR. The Draft EIR identifies mitigation measures for the Applicant to implement to reduce potential Project impacts to less than significant levels. The Project, as mitigated, would result in less than significant impacts to environmental resources; therefore, the Project is not required to implement additional mitigation. The commenter's suggestions for the Applicant to dedicate (which would require the Applicant to purchase the land from the landowner) and maintain the trail, are not warranted, but are noted and will be forwarded to the decision-making bodies for their review and consideration.

- **Desert Pines.** The Desert Pines Wildlife Sanctuary is a 99-acre County preserve located south of the Arthur B. Ripley Desert Woodland State Park. The Arthur B. Ripley Desert Woodland State Park is located closer to the Project site (approximately 2.5 miles southwest of the Project site) than the Desert Pines Wildlife Sanctuary (approximately 3 miles southwest at the nearest point), on the south side of the California Aqueduct. Based on the analyses presented in the Draft EIR, the proposed Project would have no potentially significant impacts on the Arthur B. Ripley Desert Woodland State Park, including less than significant visual impacts (see Draft EIR Figures 5.10-10 and 5.10-11). Given that the Desert Pines Wildlife Sanctuary is farther away from the Project site than the Arthur B. Ripley Woodland State Park, potential Project impacts would be less than significant. The visual qualities analyses on page 5.10-6 of Section 5.10 of the Draft EIR and the change of character analyses on page 7-2 of Section 7.0 of the Draft EIR have been changed in the Final EIR to add discussion of the Desert Pines Wildlife Sanctuary (see Section 2.0, Revisions to the Draft EIR in this Final EIR).

- **Bald Eagles.** The DEIR baseline biological data was developed through: research and review of applicable data (including the California Natural Diversity Database), studies, and literature; performance of multiple surveys at the Project area; and consultation with appropriate agencies, including the U.S. Fish and Wildlife Service (Draft EIR, Appendix E, Section 4.0). The bald eagle (*Haliaeetus leucocephalus*) was not identified in current data, studies, literature, or through agency consultation to potentially occur on-site. Additionally no bald eagles were observed to occur within the Project area during multiple biological surveys in 2009 and 2010, including bird count surveys performed in support of the Draft EIR. Bald eagles nest in large trees with open branchwork. For foraging, they typically require large bodies of water, or free-flowing rivers with abundant fish, and adjacent snags or other perches. Their preferred prey is fish, but they also have been recorded to opportunistically take a variety of birds and mammals[1]. The nearest large bodies of water suitable for foraging by this species are Lake Hughes and Lake Elizabeth, both approximately 6 miles south of the site. The site also contains no trees suitable for nesting by this species. The Project site is located far enough from the species' preferred foraging habitat that the potential for the bald eagle to opportunistically enter the site to take wildlife species on-site is considered to be low.
- **Water Use.** The Draft EIR describes the Project operational water uses in Section 4.4.7.1, which states, "Water use during operations is expected to be approximately 12 AFY of water for domestic, process water, and fire protection. Domestic use will include restrooms, kitchenette, showers, and other employee uses. Process water will be required for maintenance uses, the primary component of which will be the washing of solar panels." Section 4.4.2.1 of the Draft EIR provides a description of the operations and maintenance building, including the intended uses. The Draft EIR states, "The Project includes a single operations and maintenance (O&M) building adjacent to the solar field (see Figure 4.4-1A). The design and construction of this building will be consistent with County building standards." As indicated on Figure 4.4-5A, and stated in Section 4.4.2.1 of the Draft EIR, "the building will be approximately 100 feet wide, 200 feet long, and 27.5 feet high, and will be surrounded by a paved parking area with 40 parking spaces. The O&M building will include administrative and operational offices as well as a material storage and equipment warehouse." The description of water treatment to meet potable water standards is provided in Section 4.4.2.4 of the Draft EIR, which states, "Domestic and process water may require on-site treatment. Chemical and/or filtration treatment may be required to provide safe water for domestic use, and water softening may be required to provide the necessary water quality for solar panel cleaning."
- **Alternative 2.** This comment expresses the commenter's preference for selection of a modified alternative, but does not raise a specific concern or question regarding the

[1] CDFG, California Interagency Wildlife Task Group. 1999. Bald Eagle (*Haliaeetus leucocephalus*) In California Wildlife Habitat Relationships System.

adequacy of the analysis contained in the Draft EIR. Therefore, a response is not required pursuant to CEQA. However, the comment is acknowledged for the record and will be forwarded to the decision-making bodies for their review and consideration.

- **Cumulative Effects with Solar-Wind (Blue-Map) Overlay.** The County has not adopted a solar-wind overlay. The Project was not directed to be located at the Project area, but was proposed on the subject property for the reasons detailed in Draft EIR Section 4.1.2. As discussed in Draft EIR Section 4.6, the Draft EIR established a reasonably foreseeable cumulative project scenario at the time of the Project Notice of Preparation in April of 2009 by considering: active projects lists from LACDRP, Kern County Planning Department, City of Lancaster, California Energy Commission, the California Independent System Operator interconnection queue, and the U.S. Bureau of Land Management; planning documents that incorporate long-range growth projections, including general plans, area plans, specific plans, and Southern California Association of Governments growth projections; and other planning documents, such as previously certified EIRs. The cumulative projects list was also updated in September of 2009 during preparation of the Draft EIR. The Draft EIR identified and analyzed potential cumulative effects based on reasonably foreseeable projects, which included one solar project (City of Lancaster) and one wind project (Kern County) that had an active project status. No additional active project applications were identified or available for wind or solar projects in the Project area.
- **Fencing.** The Draft EIR visual simulations showing foreground views of the facility site (KOP #1 and #2) were prepared based on the realistic rendering of the engineering CAD plans for the facility, which included the proposed fencing. The Draft EIR Figures 5.10-4 through 5.10-7 present the existing and simulated views of the Project. As shown, neither the proposed fencing nor screening native vegetation, nor other Project components would obstruct views to the mountains, and the Project would result in less than significant impacts to the visual setting. Additionally, the Project would result in less than significant impacts to the rural character of the Project area, based on analyses of the existing setting, the Project design and appearance, and operating characteristics (Draft EIR Section 7.1).
- **Tourism.** The Project site was formerly used for agricultural production, and current adjacent land uses consist of agricultural uses, open land, scattered residences, an existing SCE high-voltage transmission corridor and powerlines, SR-138, and 170th Street West. As analyzed in the Draft EIR, the Project would result in less than significant visual impacts to the Antelope Valley California Poppy Reserve and Arthur B. Ripley Desert Woodland State Park, which are the nearest publically accessible recreational areas. As discussed above, the Project would be expected to result in less than significant visual impacts to the Desert Pines Wildlife Sanctuary, which is located south of the Arthur B. Ripley Desert Woodland State Park, and farther from the Project than the State Park.

Additionally, the Project would result in less than significant change of character (see Draft EIR Section 7.1), since the Project would not introduce urban uses, and would maintain views of the rural landscape and distant mountains (refer to Draft EIR Figures 5.10-4 through 5.10-14B). Since the Project would not significantly affect formal recreational areas and rural character of the region, the Project would not be expected to adversely affect tourism in the Project area.

3.3.4 Ms. Judy Fuentes, Member of Antelope Acres Town County

3.3.4.1 Summary of Oral Comments

Ms. Judy Fuentes is a member of the Antelope Acres Town Council, and expressed the following concerns regarding the Project and the Draft EIR:

- **Project Size.** Ms. Fuentes is concerned with the large size of the Project that would produce electricity that would be used throughout the country. Ms. Fuentes states that solar panels should be placed on individual houses and buildings instead.
- **Project Simulations.** Ms. Fuentes states that the simulations prepared appeared to be on ground level, and that the Antelope Valley area does not appear so flat, and has more landscape than shown.

3.3.4.2 Response to Oral Comments

The following responses address Ms. Fuentes's comments:

- **Project Size.** The proposed Project is a utility-scale electric facility and it is not feasible to produce 230 MW of solar electricity on the roofs of houses and buildings in the Antelope Valley. The electricity produced by the Project would interconnect to the electrical grid at SCE's planned Whirlwind Substation and serve electrical users in California.
- **Project Simulations.** The visual simulations prepared for the Project were based on photographs and video logging of actual conditions at the Project site and Project area. The photographs and videos were not taken at ground level, which is evidenced by known reference points and perspectives, such as existing powerlines, street signs, vegetation height, etc. The photographs used to prepare the visual simulations for the Draft EIR were typically taken at a height of approximately 5 to 6 feet above ground level at each applicable KOP viewing location.

3.4 RESPONSES TO COMMISSIONER COMMENTS

The County Regional Planning Commission reviewed the Project during the public RPC Hearing (June 30, 2010), where the Commission discussed the Project and requested additional information. The sections below provide clarification on the Project, respond to the Commissioner requests, and address the following:

- Section 3.4.1, Night Lighting. This section provides clarification on the type and location of Project operational lighting equipment.

- Section 3.4.2, Water Sustainability. The Commission discussed the Project's low water demands, and inquired regarding the possibility of implementing additional facility features and practices to further reduce the Project's water demands. Section 3.4.2 addresses the feasibility of implementing these features and practices.

- Section 3.4.3, Potential Locations for Off-site Mitigation Land. Section 3.4.3 responds to the Commission's request that lands south of the Project site, which contain wildflower field habitat be considered for the proposed off-site mitigation lands.

3.4.1 Night Lighting

The Project's lighting system would provide operation and maintenance personnel with illumination for both normal and emergency conditions. Project lighting would be located at the O&M building, parking area, the main plant access, pump and similar equipment locations (e.g., fire pump house), and the substation control structure (see Draft EIR Figure 4.4-1A). To ensure safety and security requirements are maintained, lights at the main plant access gate, doorways, and the O&M building parking area would remain in the on position, and would be light-activated to automatically come on in the evening and shut off in the morning. Lights at the pump, substation, and equipment locations that are not normally required to be on for safety and security and that do not need to be accessed on a frequent basis, would normally be shut off and turned on only when worker activity requires.

Lighting would be no brighter than required to meet safety and security requirements, and the lamp fixtures and lumens will be selected accordingly. Lights would be directed downward to focus illumination on the desired areas only, and would be shielded, and lenses and bulbs would not extend below the shields. Lighting would be designed to avoid light spillage onto adjacent properties. Once final plant design is complete, and prior to installation of exterior lighting systems, a facility lighting plan will be prepared for County approval that will identify the location and types of lighting, and light controls to be implemented.

In summary, impacts associated with night lighting would be less than significant.

3.4.2 Water Sustainability

The Project site is designed in accordance with Los Angeles County policies to not significantly alter the on-site drainage patterns (Draft EIR Appendix C, AV Solar Ranch One Drainage Concept Report). The Project drainage concept also incorporates the Los Angeles County Low Impact Development (LID) Standards, which reduce the impacts from development, and provide benefits of: replenishing groundwater supplies; improving the quality of surface water runoff; stabilizing natural stream characteristics; preserving natural site characteristics; and minimizing downstream impacts.

The Project facility design conforms to the existing local watershed conditions, and would not significantly impact the drainage pattern for post-development conditions. At the same time, the facility design includes infiltration areas, where excess stormwater runoff would be stored and infiltrated into the ground, in accordance with LID standards.

The Project would require approximately 12 AFY of water for domestic, process water, and fire protection during operations. Domestic uses would include restrooms, kitchenette, showers, and other employee uses. Process water would be required for maintenance uses, the primary component of which will be the washing of solar panels. In addition, up to 3 AFY of additional water may be needed in the first 2 years of operation for supplemental plantings in the 10-foot-wide vegetated landscape areas along both sides of SR-138. It is considered unlikely, but possible, that additional water (up to 3 AFY) may be needed later during the operation phase for supplemental plantings if landscape vegetation expires and needs to be replaced.

3.4.2.1 Feasibility of Recycling

The Applicant has explored several possibilities for recycling and reusing water, as described below.

Reuse of Water Tank Flush Water. The Project would involve installation of an approximately 100,000-gallon process water/firewater storage tank and 10,000-gallon firewater tank. Tank flushing is estimated to occur upon installation and approximately once every three years. In the event that tank flush water is of sufficient quality (for instance, not containing slag, oil, or other residue remnant from installation), the flush water is anticipated to be used for dust control or be discharged to on-site infiltration basins to allow recharge to the groundwater. In the event that tank flushing is required at the time that panel washing is needed, the tank flush water (if of sufficient quality), may also be used for panel washing.

Capturing Panel Wash Water. There are spaces between individual panels, such that wash water would not run off only at the base of the panels. The spacing allows for rainwater runoff to be spread over a larger area and to not be concentrated at the base of the panel

arrays, which lends to the hydrologic design of the facility. However, this design does not lend itself to collection of wash water. Capturing wash water from panel cleaning would be an expensive and labor intensive process. The panels would have to be installed and maintained with numerous collection trays and trenches at each panel in the solar field that would have to be either channelized throughout the site or manually collected and deposited into holding tanks.

Additionally, the total volume of water used for one complete washing of the panels is 4.5 acre-feet. This would be applied over approximately 30 million square feet of panels (i.e., approximately 0.05 gallon [6 ounces] per square foot of panel surface per wash event). The proposed solar field covers approximately 3 square miles in an arid environment making capture and reuse of limited quantities of wash water per unit area infeasible to capture and reuse.

3.4.2.2 Feasibility of Capturing and Storing Rain Water

The Project site is located within the western Mojave Desert, with low annual average rainfall that ranges from 7.4 inches (Lancaster) to 9.48 inches (Mojave) (Draft EIR Section 5.3.2.1). Capturing rain water over the approximately 3 square mile facility site area would require installation of a network of trenches, catch basins, and other water collection devices that would increase the amount of on-site disturbance, be potentially costly, require maintenance, and based on the limited annual precipitation conditions (i.e., rains occur primarily during the winter months), would not be expected to conserve an appreciable quantity of water. Additionally, because the development is required by LACDPW to maintain existing drainage conditions, the pre-development off-site runoff must also be maintained; thereby further reducing the potential volume of storm water available to capture. Therefore, the possibility of capturing and storing rain water is not considered a feasible option at the Project location.

The facility site, as proposed, is designed with infiltration areas that would allow excess stormwater runoff to be stored and infiltrated into the ground, similar to the present natural drainage characteristics of the site.

3.4.2.3 Feasibility of Alternate Panel Cleaning Methods

This section addresses the feasibility of possible alternate ways to keep the solar panels clear and operating efficiently.

Water from Tanks. Water from flushing the main firewater tank could be used for panel washing if the water is of sufficient quality (i.e., not containing debris, oil, or other contaminants that may become deposited on the panels or obstruct the high-pressure wash equipment), and the tank flushing is required at the same time the panels need to be washed.

Dusting Instead of Using Water. Water is an effective agent for solubilizing mud and other substances, whereas dusting would not have this ability. Thus, dusting is not considered an effective and expedient means of removing substantive materials on the panels.

Panel Coating. The Project proposes a maximum of two panel washings per year. Panel coatings have been evaluated for feasibility to reduce panel cleaning frequency. Based on PURETi, the manufacturer of a representative glass coating product, the coating is a spray-on treatment that reacts with organic matter to cause decomposition of the matter. The coating causes inorganic material, such as mud to stick to the glass less, such that the matter is removed more easily during washings.

The glass treatment is applied with an electrostatic spray system, and the chemical reacts with ultraviolet radiation to form a mineral coating. The product is considered non-hazardous, but is noted that release into the environment should be minimized, as the active ingredient is in the chemical is anatase titanium dioxide. The panels must be washed prior to application, sprayed with a basecoat, and then sprayed with the glass treatment. The coating works for up to 3 years; after which the panels must be washed, sprayed with the basecoat, and then reapplied with the coating. Use of the coating would still require periodic panel washings to remove inorganic matter, although the frequency is expected to be fewer than without the coating. However, the glass treatment is considered labor intensive and costly, and since panel washing would still be required, this option is not considered a viable approach to reducing water use.

Misting Instead of Spraying. Solar panel washing would be necessary when mud and other substances solidify onto or coat the panels. Misting water would lack the pressure that spraying water would have, and would not be effective in dislodging substantive materials from the panels. Thus, misting is not considered a feasible substitute to clean the panels.

Reuse of Panel Wash Water. As discussed in Section 3.4.2.1, the capturing of wash water from panel cleaning would be an expensive and labor intensive process. In addition, any wash water that was captured would have to be treated before reuse to remove sediment and other materials contained in the wash water that may interfere with the equipment and storage operations (i.e., clog hoses or valves, or deposit inside tanks, etc.). This option is not feasible.

3.4.2.4 Feasibility of Establishing Percolating Zones

The facility design, as proposed in the Project Drainage Concept Report (Draft EIR Appendix C, AV Solar Ranch One Drainage Concept Report), includes infiltration areas to allow excess stormwater to infiltrate into the ground while maintaining pre-development runoff condition from the site. If the Project design was modified in order to capture additional storm water, the post-development drainage patterns would be altered from pre-

development conditions, with potential adverse affects on downstream locations. Additionally, LACDPW requirements do not allow post-development runoff conditions to be substantially altered from pre-development conditions, thereby making this option infeasible.

3.4.3 Potential Locations for Off-site Mitigation Land

The Commission inquired about the locations of the 450 acres of off-site mitigation lands proposed in the Draft EIR, and requested that the Applicant explore the feasibility of selecting lands south of the Project site, which based on aerial photography, appear to contain wildflower habitat, including the California poppy.

The Applicant is currently exploring various locations for off-site mitigation lands, which are stipulated in Mitigation Measure 5.7-2, Off-site Mitigation for Loss of Habitat (as modified; see Section 2.0, Revisions to the Draft EIR of this Final EIR) to be adjacent to existing public lands, or within or adjacent to SEAs within the Antelope Valley and surrounding foothills. At least 225 acres of the mitigation land shall be acquired in the vicinity of the Antelope Valley California Poppy Reserve, including lands in or adjacent to SEA #57, or lands connecting the Poppy Reserve to the Angeles National Forest. An additional 75 acres shall be acquired within this same area, or in or adjacent to SEA #60, or adjacent to the Arthur B. Ripley Woodland State Park. Approximately half of the Project off-site mitigation lands (224.5 acres) shall consist of wildflower field, or shall be reasonably capable of being enhanced and converted to this vegetation through maintenance and management practices. The wildflower habitat area identified by the Commission would potentially satisfy a portion of the required conditions in Mitigation Measure 5.7-2, and is potentially candidate for the Project off-site mitigation land.

The mitigation land properties would be acquired within one year of Project approval or prior to the installation of 50 MW of photovoltaic solar panels, and shall contain vegetation communities similar to those found within the Project site, including rabbitbrush scrub, annual grassland, and wildflower fields, or be reasonably capable of being enhanced and converted to such habitat through the use of maintenance and management practices such that the resulting habitat values would be greater than those lost as a result of Project implementation. While the Project would not significantly impact Joshua tree woodland habitat, lands containing this vegetation community shall also be considered desirable due to the County's concern over the continuing loss and degradation of Joshua tree woodlands.

The Project off-site mitigation lands shall be required to meet specific mitigation requirements (refer to Mitigation Measure 5.7-2, Off-site Mitigation for Loss of Habitat, as modified; see Section 2.0, Revisions to the Draft EIR in this Final EIR) in order to provide suitable habitat to compensate for the Project impacts. The mitigation lands shall be managed through a Restoration, Enhancement, and Maintenance Plan, which shall also include

contingency measures in the event that habitat creation/restoration/enhancement efforts are not successful.

The selected lands shall comply with the following mitigation requirements:

1. The subject property shall be located within the greater Project vicinity, generally defined to include the Antelope Valley and surrounding foothills.
2. The subject property(s) shall contain a minimum of 450 acres of land, which shall be either comprised of vegetation communities characteristic of the Antelope Valley (rabbitbrush scrub, annual grassland, wildflower fields, and/or Joshua tree woodlands) or be reasonably capable of being enhanced and converted to such habitat through the use of maintenance and management practices such that the resulting habitat values would be greater than those lost as a result of Project implementation.
3. The subject property(s) shall either contain a minimum of 224.5 acres of wildflower field, or shall be reasonably capable of being enhanced and converted to this vegetation through maintenance and management practices.
4. The subject property(s) shall provide at least 39 acres of contiguous suitable foraging habitat for the burrowing owl, including presence of suitable burrows. If suitable natural burrows are not present within the subject property, artificial burrows shall be constructed in accordance with California Burrowing Owl Consortium (1993) guidelines.
5. The subject property(s) shall contain a minimum of 450 acres of suitable foraging habitat for grassland/scrubland bird species occurring in the Antelope Valley.
6. The subject property(s) shall contain habitat suitable for the Blainville's horned lizard. Within the mitigation site, suitable locations shall be identified for relocation of horned lizards captured and removed from the Project site pursuant to Mitigation Measure 5.7-7 (as modified; see Section 2.0, Revisions to the Draft EIR in this Final EIR). Generally, it is presumed that the wildflower field areas required by item (3) above will be suitable for this species.
7. Under no circumstances shall species identified by the Cal-IPC as invasive weeds be used in revegetation efforts.
8. The subject property(s) shall be maintained such that invasive forbs (as identified by the Cal-IPC) shall not exceed 5 percent of the vegetative cover.

In addition to meeting the requirements detailed above, the following desirable factors shall also be considered when selecting off-site mitigation property(s):

1. Lands located between blocks of protected habitat are desirable locations for off-site mitigation, as protecting these areas can ensure that essential habitat connections remain in perpetuity.

2. Lands containing Joshua tree woodland habitat are desirable locations for off-site mitigation, due to the continuing loss and degradation of this resource.
3. Lands containing junipers are also desirable locations for off-site mitigation, due to the nesting habitat they may provide for some special-status bird species.
4. Lands containing important landscape features, sensitive habitats, or listed species are desirable locations for off-site mitigation, due to the sensitivity of these resources and the general understanding that such elements are indicative of high biological value.

THE REGIONAL PLANNING COMMISSION

County of Los Angeles

MINUTES

Meeting Place: Room 150 Hall of Records
320 W. Temple Street
Los Angeles, California 90012

Meeting Date: June 30, 2010 - Wednesday Time: 9:00 a.m.

Present:

Commissioners Rew, Modugno, Bellamy, Helsley

Absent: Commissioner Valadez

Ex Officio Members:

Director of Public Works: Mr. Amir Ibrahim, Senior Civil Engineer

County Counsel: Ms. Patricia Keane, Deputy

Planning Director: Mr. Sorin H. Alexanian, Deputy Director, Current Planning Division

Forester and Fire Warden: Ms. Janna Masi, Supervising Fire Prevention Engineer

PLEDGE OF ALLEGIANCE

1. The Pledge of Allegiance was led by Commissioner Modugno representing the Fifth Supervisorial District.

APPROVAL OF AGENDA

2. Motion/second by Commissioners Modugno/Helsley– that the agenda for June 30, 2010 be approved.

Vote-Ayes: Commissioners Modugno, Helsley, Rew, Bellamy
Absent: Commissioner Valadez

COUNTY COUNSEL REPORT

3. There were no reports given by County Counsel.

DIRECTOR/DEPUTY DIRECTOR

4. There were no reports given by Director/Deputy Director.

06/30/10

MINUTES FOR APPROVAL

5. Motion/second by Commissioners Helsley/Modugno – that the minutes for June 2, 2010 be approved.

Vote-Ayes: Commissioners Helsley, Modugno, Rew, Bellamy
Absent: Commissioner Valadez

PUBLIC HEARING

Special Projects

Action Taken as Noted

6. Project No. R2009-02239-(5). Applicant: AV Solar Ranch One, LLC. SR 138 and 170th Street West, Antelope Valley, Antelope Valley West Zoned District. a. Vesting Tentative Tract No. 071035. To authorize a reversion to acreage from 147 lots to 1 lot on 790 acres in the A-2-5 (Heavy Agricultural-Five Acres Minimum Required Area) zone. b. Conditional Use Permit Case No. 200900026. To authorize construction, operation, and maintenance of a 230-megawatt panel photovoltaic electricity power generation facility on 2,093 gross acres and onsite grading in excess of 100,000 cubic yards in the A-2-5 zone; and installation of 0.75 miles of onsite and 2.25 miles of offsite high voltage electricity transmission lines in the A-2-5 and A-1-2 (Light Agricultural-Two Acres Minimum Required Area) zones. c. Environmental Assessment Case No. 200900027. A Draft Environmental Impact Report will also be considered pursuant to CEQA reporting requirements.

Motion/second by Commissioners Modugno/Helsley – that the item be continued to Wednesday, September 15, 2010 to allow close of the Draft Environmental Impact Report (DEIR) comment period on July 30, 2010, and for staff and the applicant to further address issues the Commission raised as follows: 1) provide time for the applicant time to meet with the Antelope Acres Town Council to address issues and concerns raised by two town council members testifying on the project; 2) provide further analysis of above ground versus underground transmission lines; 3) parcel to the South of the project where poppy field could be preserved; 4) consider bonding or other sources of guaranteeing decommissioning of the project; and 5) to allow time for staff to prepare draft conditions and final EIR and entitlement documentation for consideration by the Commission.

Vote-Ayes: Commissioners Modugno, Helsley, Rew, Bellamy
Absent: Commissioner Valadez

06/30/10

CONTINUATION OF REPORTS

7. Commission/Counsel/Director

There were no reports given by the Commission/Counsel/Director.

PUBLIC COMMENT

8. Public comment pursuant to Section 54954.3 of the Government Code.

There were no requests by members of the public to address the Commission.

ADJOURNMENT

A recording of the testimony received and the discussions held at this meeting and a copy of all findings and resolutions acted upon by the Commission are on file in the Department of Regional Planning.

The Commission adjourned at 11:00 a.m. to Wednesday, July 7, 2010.

Rosie O. Ruiz, Commission Secretary

ATTEST

APPROVE

Wayne Rew, Chair

Sorin H. Alexanian, Deputy Director
Current Planning Division

SECTION 4.0
COMMENTS AND RESPONSES TO WRITTEN COMMENTS

4.1 INTRODUCTION

The Draft EIR for AV Solar Ranch One Project was circulated on June 16, 2010 for a formal 45-day public comment period ending on July 30, 2010. During that time, the County of Los Angeles Department of Regional Planning received a total of 14 individual comment letters on the Draft EIR as summarized in Table 4-1.

The County of Los Angeles Regional Planning Commission (RPC) held a public hearing on the Draft EIR on June 30, 2010. Public comments were received at the RPC hearing. Refer to Section 3.0 of this Final EIR for the June 30, 2010 RPC Hearing minutes and responses to oral comments received at the hearing.

The Responses to Written Comments are divided into four sections as follows: State Agencies (SA); Local Agencies (LA); Organizations (ORG); and Individuals (I).

Within the four categories, individual comment letters are generally numbered chronologically (i.e., by letter date) starting with the earliest date. For example, State Agencies (SA) comment letter 1 from the Native American Heritage Commission) is identified as Comment Letter SA-1 and the individual comments identified in this letter are identified as SA-1-1, SA-1-2, etc. This comment identification convention is used for the following three comments source categories as well (refer to Table 4-1). The Responses to Written Comments presented herein are organized as follows:

- Written responses
- Comment letter (with comment numbers identified in margins of letters)

The written comment letters and responses follow and are organized as follows:

- Section 4.2 – State Agencies
- Section 4.3 – Local Agencies
- Section 4.4 – Organizations
- Section 4.5 – Individuals

TABLE 4-1
SUMMARY OF WRITTEN COMMENTS RECEIVED ON THE DRAFT EIR FOR THE PROPOSED AV SOLAR RANCH ONE PROJECT

Date	Commenter/Affiliation	Comment Item ID	Number of Comments Identified
Federal Agencies			
None			
State Agencies (SA)			
7/15/20	Dave Singleton/Native American Heritage Commission	SA-1	14
7/16/10	Carl Shiigi/California Department of Transportation	SA-2	8
7/30/10	Scott Morgan/State Clearinghouse	SA-3	2
Local Agencies (LA)			
7/9/10	Gary T. K. Tse/Los Angeles County Sheriff Department	LA-1	2
7/15/10	John R. Todd/Los Angeles County Fire Department	LA-2	6
7/15/10	Richard Kite/City of Palmdale	LA-3	1
7/20/10	Bret Banks/Antelope Valley Air Quality Management District	LA-4	3
Organizations (ORG)			
7/30/10	Kate Allen/Antelope Valley Group of Sierra Club	ORG-1	5
7/21/10	Elizabeth Klebaner/Adams Broadwell Joseph & Cardozo	ORG-2	1
7/30/10	Elizabeth Klebaner/Adams Broadwell Joseph & Cardozo	ORG-3	79*
Individuals (I)			
6/21/10	Shizuko Hill	I-1	1
6/21/10	Ponciano Manalo	I-2	2
7/26/10	L. Dean Webb	I-3	7
7/30/10	Several Residents of Antelope Acres (Stout, Kerekes, Seybold, Fuentes)	I-4	6

* Note: ORG-3 includes 79 comments in letter; plus 15 comments in Attachment A (ORG-3A); and 25 comments in Attachment B (ORG-3B).

4.2 STATE AGENCIES

Comment letters from State agencies and corresponding Written Responses to Comments follow for the following agency letters:

- Native American Heritage Commission (SA-1)
- California Department of Transportation (SA-2)
- State Clearinghouse (SA-3)

Written Responses to Native American Heritage Commission (SA-1)

Response SA-1-1:

Comment identifies the Native American Heritage Commission (NAHC) as a trustee agency, and introduces the subsequent comments in the comment letter. No response is required.

Response SA-1-2:

A Sacred Lands File search was obtained from the NAHC on December 8, 2008 for the AV Solar Ranch One Project. The NAHC provided a list of tribes in the Project area, and the individuals on the list were notified via phone and email and invited to attend an on-site meeting. In addition, tribal entities provided by the California Department of Parks and Recreation were also contacted.

As documented in Draft EIR Appendix F (Section 4.3, page 4-2), on January 23, 2009 an on-site meeting was held with local Native Americans for the AV Solar Ranch One Project to discuss the project, potential impacts to cultural resources, and any concerns Native American might have concerning the project. The meeting was held with the following individuals: Steven Ortega, Tataviam/Fernadeno Band of Mission Indians; Randy Folkes, Tataviam/Fernadeno Band of Mission Indians; John Valenzuela, Tataviam/Fernadeno Band of Mission Indians; and Robert Robinson, Kern Valley Indian Council and Historic Preservation Officer.

Additional coordination letters were sent certified return receipt (U.S. Mail) to all parties recommended by the NAHC and California State Parks on March 30, 2009, prior to the start of the Phase I Archaeological Survey.

During the Phase I Archaeological Survey, Randy Folkes (Tataviam/Fernadeno Band of Mission Indians), served as Tribal Monitor for the Project.

Response SA-1-3:

During the Phase I Archaeological Survey, Randy Folkes, from the Tataviam/Fernadeno Band of Mission Indians, served as Tribal Monitor for the duration of the Project survey.

Response SA-1-4:

A cultural resource site record and literature search was conducted on December 4, 2008 at the South Central Coastal Information Center, part of the California Historic Resource Information System (CHRIS). The search was conducted by URS in order to document the nature, location and results of previous cultural resource investigations within and adjacent to the Project property and within a 0.5-mile radius, and any sites listed on the National

Register of Historic Places (NRHP), California Register of Historical Resources (CRHR), California Historical Landmarks (CHL), or local monuments. An additional records search was conducted on January 16, 2009 by the Southern San Joaquin Valley Archaeological Information Center (SSJVAIC) for the extension of the transmission line for the Project.

Response SA-1-5:

All consultation with tribes and interested Native American tribes and Native American individuals on the NAHC list was conducted in compliance with the requirements of federal NEPA and Section 106 and 4(f) of federal NHPA, 36 CFR Part 800.3, the President's Council of Environmental Quality and NAGPRA, as appropriate. Please see Response SA-1-2.

Response SA-1-6:

Comment noted. The cultural resources assessment and analysis performed for and in support of the AV Solar Ranch One Project Draft EIR considered and addressed the applicable federal historic properties and cultural landscape related requirements cited in this comment, as applicable. Refer to Draft EIR Cultural Resources Sections 5.8.2 (Environmental Setting) and 5.8.3 (Project Impacts).

Response SA-1-7:

The cultural resources assessment and analysis performed for and in support of the AV Solar Ranch One Project Draft EIR considered avoidance, which appears in Mitigation Measure 5.8-1 (Avoid Archaeological Sites) in Section 5.8 of the Draft EIR.

Response SA-1-8:

The Draft EIR includes provisions for accidentally discovered archaeological resources during construction, as addressed in Mitigation Measure 5.8-3 in Draft EIR Section 5.8.5, and provides the process to follow in the event of an accidental discovery of any human remains in Mitigation Measure 5.8-5.

Response SA-1-9:

The cultural resources assessment and analysis performed for and in support of the AV Solar Ranch One Project Draft EIR considered cultural resource confidentiality requirements cited in this comment, including the NAHC Sacred Lands Inventory. Confidential cultural resources information, including site locality information and Native American input, is presented in a Confidential Portion of the Phase I Cultural Resources Technical Report prepared for the Project and is not included with the Draft EIR.

Response SA-1-10:

The CEQA Initial Study prepared for the Project (Draft EIR Appendix A) did not identify the presence or likely presence of Native American human remains in the Project APE. Please refer to Responses SA-1-2 and SA-1-5 regarding Native American consultation that occurred associated with preparation of the Draft EIR and associated cultural resources investigations. The LACDRP as CEQA Lead Agency has ensured that the Draft EIR related cultural resource studies for the Project have complied with applicable CEQA Guidelines.

Response SA-1-11:

The Project's proposed transmission line is not located within a transmission corridor zone established by the State Energy Resources Conservation and Development Commission; accordingly, SB 1059 (codified at Public Resources Code, Chapter 4.30) does not apply to the Project. However, the Applicant performed tribal consultation as discussed in Response SA-1-5.

Response SA-1-12:

Consistent with the requirements cited in this comment, the Draft EIR includes provisions for accidental discovery of any human remains in Mitigation Measure 5.8-5 in Section 5.8 (Cultural Resources). Mitigation Measure 5.8-5 requires County coroner determinations, and in the event that the discovered remains are determined to be Native American in origin, the Project would be required to contact the NAHC.

Response SA-1-13:

Please refer to Response SA-1-7.

Response SA-1-14:

This comment is a two page attachment that contains a list of Native American contacts. No response is required. However, the comment is acknowledged for the record and will be forwarded to the decision-making bodies for their review and consideration.

SA-1

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

RECEIVED
JUL 20 2010

July 15, 2010

Ms. Christina Tan, Planner
LOS ANGELES COUNTY DEPARTMENT OF REGIONAL PLANNING
320 West Temple Street
Los Angeles, CA 90012

Re: SCH#2009041145; CEQA Notice of Completion; draft Environmental Impact Report (DEIR) for the **AV Solar Ranch One Project** "; located in the Antelope Valley; Los Angeles County, California.

Dear Ms. Tan:

The Native American Heritage Commission (NAHC) is the state 'trustee agency' pursuant to Public Resources Code §21070 for the protection and preservation of California's Native American Cultural Resources.. (Also see *Environmental Protection Information Center v. Johnson (1985) 170 Cal App. 3rd 604).* The California Environmental Quality Act (CEQA - CA Public Resources Code §21000-21177, amended in 2009) requires that any project that causes a substantial adverse change in the significance of an historical resource, that includes archaeological resources, is a 'significant effect' requiring the preparation of an Environmental Impact Report (EIR) per the California Code of Regulations §15064.5(b)(c)(f) CEQA guidelines). Section 15382 of the CEQA Guidelines defines a significant impact on the environment as "a substantial, or potentially substantial, adverse change in any of physical conditions within an area affected by the proposed project, including ...objects of historic or aesthetic significance." 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. SA-1-1

The Native American Heritage Commission did perform a Sacred Lands File (SLF) search in the NAHC SLF Inventory, established by the Legislature pursuant to Public Resources Code §5097.94(a) and Native American Cultural resources **were not identified** within the APE identified for the project.. However, there are Native American cultural resources in close proximity to the APE. Early consultation with Native American tribes in your area is the best way to avoid unanticipated discoveries once a project is underway. Enclosed are the names of the nearest tribes and interested Native American individuals that the NAHC recommends as 'consulting parties,' for this purpose, that may have knowledge of the religious and cultural significance of the historic properties in the project area (e.g. APE). We recommend that you contact persons on the attached list of Native American contacts. A Native American Tribe or Tribal Elder may be the only source of information about a cultural resource.. Also, the NAHC recommends that a Native American Monitor or Native American culturally knowledgeable person be employed whenever a professional archaeologist is employed during the 'Initial Study' and in other phases of the environmental planning processes.. Furthermore we suggest that you contact the California Historic Resources Information System (CHRIS) at the Office of Historic Preservation (OHP) Coordinator's office (at (916) 653-7278, for referral to the nearest OHP Information Center of which there are 11. -2 -3 -4

Consultation with tribes and interested Native American tribes and interested Native American individuals, as consulting parties, on the NAHC list ,should be conducted in compliance with the requirements of federal NEPA (42 U.S.C. 4321-43351) and Section 106 and 4(f) of federal NHPA (16 U.S.C. 470 [f]*et se),* 36 CFR Part 800.3, the President's Council on Environmental Quality (CSQ; 42 U.S.C. 4371 *et seq.*) and NAGPRA (25 U.S.C. 3001-3013), as appropriate. The 1992 *Secretary of the Interior's Standards for the Treatment of Historic Properties* were revised so that they could be applied to all historic resource types included in the National Register of Historic Places and including *cultural landscapes.* -5 -6

Lead agencies should consider avoidance, as defined in Section 15370 of the California Environmental Quality Act (CEQA) when significant cultural resources could be affected by a project. Also, Public Resources Code Section 5097.98 and Health & Safety Code Section 7050.5 provide for provisions for accidentally discovered archeological resources during construction and mandate the processes to be followed in the event of an accidental discovery of any human remains in a project location other than a 'dedicated cemetery. Discussion of these should be included in your environmental documents, as appropriate. -7 -8

The authority for the SLF record search of the NAHC Sacred Lands Inventory, established by the California Legislature, is California Public Resources Code §5097.94(a) and is exempt from the CA Public Records Act (c.f. California Government Code §6254.10). The results of the SLF search are confidential. However, Native Americans on the attached contact list are not prohibited from and may wish to reveal the nature of identified cultural resources/historic properties. Confidentiality of "historic properties of religious and cultural significance' may also be protected the under Section 304 of the NHPA or at the Secretary of the Interior' discretion if not eligible for listing on the National Register of Historic Places. The Secretary may also be advised by the federal Indian Religious Freedom Act (cf. 42 U.S.C, 1996) in issuing a decision on whether or not to disclose items of religious and/or cultural significance identified in or near the APE and possibly threatened by proposed project activity. -9

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. Although tribal consultation under the California Environmental Quality Act (CEQA; CA Public Resources Code Section 21000 – 21177) is 'advisory' rather than mandated, the NAHC does request 'lead agencies' to work with tribes and interested Native American individuals as 'consulting parties,' on the list provided by the NAHC in order that cultural resources will be protected. However, the 2006 SB 1059 the state enabling legislation to the Federal Energy Policy Act of 2005, does <u>mandate tribal consultation</u> for the 'electric transmission corridors. This is codified in the California Public Resources Code, Chapter 4.3, and §25330 to Division 15, requires consultation with California Native American tribes, and identifies both federally recognized and non-federally recognized on a list maintained by the NAHC -10 -11

Health and Safety Code §7050.5, Public Resources Code §5097.98 and Sec. §15064.5 (d) of the California Code of Regulations (CEQA Guidelines) mandate procedures to be followed, including that construction or excavation be stopped in the event of an accidental discovery of -12

any human remains in a location other than a dedicated cemetery until the county coroner or medical examiner can determine whether the remains are those of a Native American. . Note that §7052 of the Health & Safety Code states that disturbance of Native American cemeteries is a felony. -12

Again, Lead agencies should consider avoidance, as defined in §15370 of the California Code of Regulations (CEQA Guidelines), when significant cultural resources are discovered during the course of project planning and implementation -13

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

Sincerely,

Dave Singleton
Program Analyst

Attachment: List of Native American Contacts

Cc: State Clearinghouse

Native American Contacts
July 15, 2010
Los Angeles County

SA-1

Charles Cooke
32835 Santiago Road
Acton , CA 93510
(661) 733-1812 - cell
suscol@intox.net

Chumash
Fernandeno
Tataviam
Kitanemuk

Ron Wermuth
P.O. Box 168
Kernville , CA 93238
warmoose@earthlink.net
(760) 376-4240 - Home
(916) 717-1176 - Cell

Tubatulabal
Kawaiisu
Koso
Yokuts

San Manuel Band of Mission Indians
James Ramos, Chairperson
26569 Community Center Drive
Highland , CA 92346
(909) 864-8933
(909) 864-3724 - FAX
(909) 864-3370 Fax

Serrano

Kitanemuk & Yowlumne Tejon Indians
Delia Dominguez
981 N. Virginia
Covina , CA 91722
(626) 339-6785

Yowlumne
Kitanemuk

Fernandeno Tataviam Band of Mission Indians
William Gonzales, Cultural/Environ Depart/Rudy Ortega
601 South Brand Boulevard, Suite 102
San Fernando CA 91340
rortega@tataviam-nsn.us
(818) 837-0794 Office
(818) 837-0796 Fax

Fernandeno
Tataviam

San Fernando Band of Mission Indians
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tsen2u@hotmail.com
(661) 753-9833 Office
(760) 885-0955 Cell
(760) 949-1604 Fax

Fernandeño
Tataviam
Serrano
Vanyume
Kitanemuk

-14

LA City/County Native American Indian Comm
Ron Andrade, Director
3175 West 6th Street, Rm.
Los Angeles , CA 90020
randrade@css.lacounty.gov
(213) 351-5324
(213) 386-3995 FAX

San Manuel Band of Mission Indians
Ann Brierty, Policy/Cultural Resources Departmen
26569 Community Center. Drive
Highland , CA 92346
abrierty@sanmanuel-nsn.
(909) 864-8933 EXT-3250
(909) 649-1585 - cell
(909) 862-5152 Fax

Serrano

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

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code. Also, federal National Environmental Policy Act (NEPA), National Historic Preservation Act, Section 106 and fed eral NAGPRA. And 36 CFR Part 800.3.

This list is only applicable for contacting local Native Americans with regard to cultural resources for the proposed SCH#2009041145; CEQA Notice of Completion; draft Environmental Impact Report (DEIR) for the AV Solar Ranch One Project; located in the Antelope Valley;Los Angeles County, California.

Native American Contacts
July 15, 2010
Los Angeles County

SA-1

Kern Valley Indian Council
Robert Robinson, Historic Preservtion Officer
P.O. Box 401
Weldon , CA 93283
brobinson@mchsi.com
(760) 378-4575 (Home)
(760) 549-2131 (Work)

Tubatulabal
Kawaiisu
Koso
Yokuts

-14-

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

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code. Also, federal National Environmental Policy Act (NEPA), National Historic Preservation Act, Section 106 and fed eral NAGPRA. And 36 CFR Part 800.3.

This list is only applicable for contacting local Native Americans with regard to cultural resources for the proposed SCH#2009041145; CEQA Notice of Completion; draft Environmental Impact Report (DEIR) for the AV Solar Ranch One Project; located in the Antelope Valley;Los Angeles County, California.

Written Responses to California Department of Transportation (SA-2)

Response SA-2-1:

Comment introduces the California Department of Transportation (Caltrans) review of the AV Solar Ranch One Project. No response is required.

Response SA-2-2:

The Draft EIR acknowledges the potential SR-138 corridor concept (Draft EIR Sections 4.2 and 5.11.2.2.1).The Project is set back from SR-138 as shown on Draft EIR Figure 4.4-1A (Facility Site Plan) and offers a dedication of 100 feet on both sides of the centerline of SR-138 within the Project site boundaries to accommodate Caltrans potential future widening of SR-138. For reference, the applicable text from Draft EIR Sections 4.2 and 5.11.2.2.1 is repeated here:

"As required by Los Angeles County and consistent with the Caltrans Project Study Report for State Route 138 (SR-138) between Interstate 5 (I-5) and State Route 14 (SR-14), dated March 23, 2009, and County roadway width requirements, a dedication in fee simple shall be offered by the Applicant to Caltrans of additional land on both sides of the existing Caltrans right-of-way, from 160th Street West to 170th Street West, to provide a total right-of-way width of 100 feet on both sides of the centerline of SR-138, or as otherwise required by Caltrans, for a total right-of-way width of 200 feet. From 170th Street West to 175th Street West, a dedication in simple fee shall be offered of additional land north of the Caltrans right-of-way of SR-138 for a total right-of-way width of 100 feet north of centerline of SR-138, or as otherwise required by Caltrans up to a total SR-138 right-of-way width of 200 feet. The dedicated area shall be maintained by Applicant until such time the deed for the applicable area is transferred to Caltrans. Additionally, an irrevocable 10-foot-wide slope easement on both sides of the 200-foot-wide Caltrans right-of-way, from 160th Street West to 170th Street West, and on the north side of the Caltrans easement from 170th Street West to 175th Street West, shall be offered to the County. The location of this easement shall be determined once Caltrans identifies the location of the 200-foot-wide easement. The slope easement shall be maintained by the Applicant until such time that the County installs improvements."

Response SA-2-3:

The proposed Project does not include any planned lane closures, including shoulders on SR-138, that would be expected to warrant a Construction Management Plan. The proposed Project includes an aerial 34.5 kV transmission line crossing of SR-138 near the intersection with 170th Street West as shown on Draft EIR Figure 4.4-1A (Facility Site Plan). As discussed in Draft EIR Section 5.11.3.3.1, it is expected that this crossing would require

intermittent traffic flow restriction(s) on SR-138 to allow stringing and tensioning of the transmission lines across the roadway in a safe manner and that this work would be performed in accordance with the conditions in the required Caltrans Encroachment Permit and in accordance with Mitigation Measure 5.11-1, Provide Adequate Worksite Traffic Control (as modified; see Section 2.0 – Revisions to the Draft EIR in this Final EIR). Due to the temporary, one-time nature of this activity, it is expected that this activity would be performed in accordance with the requirements of an encroachment permit and that a Construction Management Plan would not be required (Shiigi, C. 2010. Personal communication between Carl Shiigi [Caltrans] and N. Casil [URS Corporation] in August 2010.).

Based on the Caltrans Highway Design Manual and the AASHTO-Geometric Design of Highways and Streets (Green Book) criteria for acceleration and deceleration lanes, the Project does not warrant the need for acceleration and deceleration lanes. Factors considered include: gradient; lane, shoulder, and median width; traffic volume and composition, turning volumes; horizontal curve radii; sight distance; and proximity and types of adjacent intersections. Based on the evaluation performed, all applicable roadway features are satisfactory and adequate and do not warrant dedicated acceleration and deceleration lanes for Project construction traffic. Additional Queue, Delay, and Critical Gap Analysis was performed to support the traffic analysis (involving Synchro and TRAFFIX program calculations to evaluate Highway Capacity Manual Unsignalized Intersections operations) and concluded the following:

- Delay – All critical movement delay will operate at acceptable LOS C or better.
- Queue – No critical movement vehicle queuing.
- Critical Gaps – There is sufficient gap time for vehicle turns.
- Probability of Queue Free State – The majority of the vehicle movements will not experience queuing.

The traffic impact assessment presented in Draft EIR Section 5.11 identifies the need for use of flagmen as a safety measure to mitigate the impacts of construction traffic and activities. The use of flagmen and other measures are discussed in Section 5.11 and presented in Draft EIR Mitigation Measure 5.11-1 (Provide Adequate Worksite Traffic Control).

Response SA-2-4:

In response to this comment, Section 5.11.1.2.5 (Section 5.11, page 5.11-2) of the Draft EIR, which identifies the requirement for encroachment permits required for work activities within State and County roadways, has been changed to identify that aerial utility crossings of such roadway rights of way would require encroachment permits (see Section 2.0, Revisions to the

Draft EIR in this Final EIR). As discussed in Draft EIR Section 5.11.3.3.1 (Potential Impact 5.11-1: Impacts on SR-138 and 170th Street West at Utility Crossings), the requirements of the encroachment permits from Caltrans for excavations under, or aerial crossings over, SR-138 would need to be complied with including associated traffic control and safety requirements. Mitigation Measure 5.11-1 (Provide Adequate Worksite Traffic Control) in Section 5.11.5 (page 5.11-22) of the Draft EIR has been changed to clarify that encroachment permits and worksite traffic control plans would be required from Caltrans as well as Los Angeles and Kern counties (see Section 2.0, Revisions to the Draft EIR in this Final EIR).

Response SA-2-5:

The traffic assessments presented in Section 5.11.3.3 of the Draft EIR concluded that construction phase traffic impacts, including consideration of truck traffic, would be less than significant. As assessed in Draft EIR Traffic and Access Section 5.11.3.1.1 (Overview), Draft EIR Table 5.11-6 (Peak Project Construction Trip Generation), and Appendix G (Traffic Impact Analysis Report), at least 50 percent of truck deliveries would occur during off-peak commute periods. Based on the Traffic Impact Analysis performed for the Project and presented in the Draft EIR, limiting at least 50 percent of truck deliveries to non-peak hours is adequate to avoid any potentially significant traffic flow impacts. Mitigation Measure 5.11-3 (Limit 50 Percent of Truck Deliveries to Off-peak Hours) has been added to Section 5.11.5 of the Draft EIR to require that Project-related truck traffic during peak commute hours is limited to 50 percent consistent with the assumption used in the traffic impact analysis in the Draft EIR (see Section 2.0, Revisions to the Draft EIR in this Final EIR).

Response SA-2-6:

The proposed Project does not include any planned "platooning" of truck trips on mainline freeways, conventional State Highways, freeway ramps and/or freeway ramp intersections. Therefore, the proposed Project would be expected to be compliant with this Caltrans recommendation.

Response SA-2-7:

Draft EIR Section 5.11.1.2.4 recognizes that Transportation Permits are required for transport of oversized or excessive loads on state highways. Section 5.11.1.2.4 (Section 5.11, page 5.11-2) of the Draft EIR has been changed to clarify that the Project would need to obtain Transportation Permits from Caltrans for transport of any oversize or excessive loads on state highways (see Section 2.0, Revisions to the Draft EIR in this Final EIR).

Response SA-2-8:

As discussed in Draft EIR Sections 5.3.3.2.4 and 5.5.3.2.3, and identified in Mitigation Measure 5.3-1 in Section 5.3 (Flood Hazards), the Project would implement applicable stormwater management measures and BMPs.

DEPARTMENT OF TRANSPORTATION
DISTRICT 7, OFFICE OF PUBLIC
TRANSPORTATION AND REGIONAL PLANNING
IGR/CEQA BRANCH
100 SOUTH MAIN STREET
LOS ANGELES, CA 90012
PHONE (213) 897-6696
FAX (213) 897-1337

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SA-2

Flex your power!
Be energy efficient!

July 16, 2010

IGR/CEQA DEIR CS/100627
County of Los Angeles
AV Solar Ranch One Project
Vic. LA-138-22.05, SCH# 2009041145

Ms. Christina Tran
County of Los Angeles
Department of Regional Planning
320 West Temple Street
Los Angeles, CA 90012

Dear Ms. Tran:

Thank you for including the California Department of Transportation (Caltrans) in the environmental review process for the Draft Environmental Impact Report (DEIR) for the AV Solar Ranch One Project. The proposed project consists of a 230-megawatt (MW) solar photovoltaic (PV) facility on approximately 2,100 acres of former agricultural land in northern Los Angeles County along State Route 138 (SR-138). Based on the information received, we have the following comments: SA-2-1

The project will need to conform to Caltrans System Planning State Route 138 (SR-138) Transportation Concept Report (TCR), route concept alternatives and Caltrans Project Study Report (PSR) to address projected operational deficiencies and facility concept for the impacted segment. Of concern would be the ultimate corridor concept for the impacted segment. The current facility includes one lane in each direction. Major development along the corridor including the Centennial Development Project will require widening to at least three lanes in each direction along portions of this corridor. The portion of State Route 138 along the project site will need to be widened to at least two lanes in each direction. Right-of-way dedication or sufficient set back of the project will be needed for future widening of the highway. -2

A Construction Management Plan will be needed for any lane closures including shoulders on State Route 138. Acceleration and deceleration lanes and the use of flagmen may be needed as a safety measure to mitigate the impact of construction traffic. -3

A Caltrans Encroachment Permit will be needed for any work to be performed within the State Right-of-way including installation of transmission lines across State Route 138. A traffic break will be required while installing an Arial transmission line across State Route 138. Plans will be needed showing the location and type of support structures. -4

SA-2

We recommend that construction related truck trips on State Highways be limited to off-peak commute periods. The contractor should avoid platooning of truck trips on mainline freeways, on conventional State Highways, on freeway ramps, and at freeway ramp intersections. Transport of over-size or over-weight vehicles on State Highways will need a Caltrans Transportation Permit. -5 -6 -7

A Stormwater Management Plan will be needed to control the discharge of stormwater runoff from the project site. Best Management Practices (BMPs) will need to be implemented to assure the clean discharge of stormwater runoff. -8

If you have any questions regarding our comments, you may reach me at (213) 897-1726 and please refer to our record number 100627/CS.

Sincerely,

Carl Shiigi
IGR/CEQA Coordinator
Office of Regional Planning

cc: Scott Morgan, State Clearinghouse

Written Responses to State Clearinghouse (SA-3)

Response SA-3-1:

Comment states that the State Clearinghouse has submitted the AV Solar Ranch One Project Draft EIR to selected state agencies for review, and acknowledges that the Draft EIR has complied with the State Clearinghouse review requirements for draft environmental documents pursuant to the California Environmental Quality Act. No response is required. However, the comment is acknowledged for the record and will be forwarded to the decision-making bodies for their review and consideration.

Response SA-3-2:

The comment letter attachments comprise the State Clearinghouse Data Base Document Details Report, and Project comment letters received from: the Native American Heritage Commission (NAHC) dated July 15, 2010; and State of California Department of Transportation (Caltrans) dated July 16, 2010. The NAHC and Caltrans comment letters on the Draft EIR are responded to fully in Responses SA-1 and SA-2, respectively, in Section 4.2 of this Final EIR.

SA-3

STATE OF CALIFORNIA

Governor's Office of Planning and Research

State Clearinghouse and Planning Unit

Arnold Schwarzenegger
Governor

Cathleen Cox
Acting Director

July 30, 2010

RECEIVED
AUG - 2 2010

Christina Tran
Los Angeles County Department of Regional Planning
320 West Temple Street
Los Angeles, CA 90012

Subject: AV Solar Ranch One Project (R2009-02239 / TR071035 / RCUPT200900026 / RENVT200900027)
SCH#: 2009041145

Dear Christina Tran:

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 July 29, 2010, 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."

SA-3-1

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.

Sincerely,

Scott Morgan
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

SA-3

SCH# 2009041145
Project Title AV Solar Ranch One Project (R2009-02239 / TR071035 / RCUPT200900026 / RENVT200900027)
Lead Agency Los Angeles County

Type EIR Draft EIR

Description The proposed Project would consist of a 230 megawatt solar photovoltaic (PV) facility on 2,100 acres. Major project components include PV panel arrays; an electrical substation; infiltration basins; two water tanks; a septic system; and a 20,000 sf Operations and Maintenance building with associated parking. The Project also includes a 230 kilovolt (kV) transmission line for interconnecting the electrical output of the Project to the regional transmission system. The proposed transmission line is ~4.25 miles long, and will interconnect to Southern California Edison's (SCE) planned Whirlwind Substation north of the Project site in southern Kern County.

Lead Agency Contact

Name Christina Tran
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
Region
Lat / Long
Cross Streets SR-138 and 170th Street
Parcel No.
Township 8N **Range** 14,15W **Section** **Base** SBB&M

Proximity to:

Highways SR - 138
Airports
Railways
Waterways Unnamed drainage courses
Schools
Land Use Residential ranch development/A-2-5 /Non Urban 1

Project Issues Aesthetic/Visual; Agricultural Land; Air Quality; Archaeologic-Historic; Biological Resources; Cumulative Effects; Drainage/Absorption; Flood Plain/Flooding; Forest Land/Fire Hazard; Geologic/Seismic; Growth Inducing; Landuse; Noise; Public Services; Other Issues; Septic System; Soil Erosion/Compaction/Grading; Solid Waste; Toxic/Hazardous; Traffic/Circulation; Vegetation; Water Quality; Water Supply; Wildlife

Reviewing Agencies Resources Agency; Department of Fish and Game, Region 5; Office of Historic Preservation; Department of Parks and Recreation; Department of Water Resources; California Highway Patrol; Caltrans, District 7; Regional Water Quality Control Bd., Region 6 (Victorville); Department of Toxic Substances Control; Native American Heritage Commission; California Energy Commission; Public Utilities Commission; State Lands Commission

Date Received 06/15/2010 **Start of Review** 06/15/2010 **End of Review** 07/29/2010

SA-3-2

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

SA-3

STATE OF CALIFORNIA Arnold Schwarzenegger, G

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

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STATE CLEARING HOUSE

Clear
07/29/2010
e.

July 15, 2010

Ms. Christina Tan, Planner
LOS ANGELES COUNTY DEPARTMENT OF REGIONAL PLANNING
320 West Temple Street
Los Angeles, CA 90012

Re: SCH#2009041145; CEQA Notice of Completion; draft Environmental Impact Report (DEIR) for the **AV Solar Ranch One Project** "; located in the Antelope Valley; Los Angeles County, California.

Dear Ms. Tan:

The Native American Heritage Commission (NAHC) is the state 'trustee agency' pursuant to Public Resources Code §21070 for the protection and preservation of California's Native American Cultural Resources.. (Also see *Environmental Protection Information Center v. Johnson (1985) 170 Cal App. 3rd 604).* The California Environmental Quality Act (CEQA - CA Public Resources Code §21000-21177, amended in 2009) requires that any project that causes a substantial adverse change in the significance of an historical resource, that includes archaeological resources, is a 'significant effect' requiring the preparation of an Environmental Impact Report (EIR) per the California Code of Regulations §15064.5(b)(c)(f) CEQA guidelines). Section 15382 of the CEQA Guidelines defines a significant impact on the environment as "a substantial, or potentially substantial, adverse change in any of physical conditions within an area affected by the proposed project, including ...objects of historic or aesthetic significance." 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.

SA-3-2

The Native American Heritage Commission did perform a Sacred Lands File (SLF) search in the NAHC SLF Inventory, established by the Legislature pursuant to Public Resources Code §5097.94(a) and Native American Cultural resources **were not identified** within the APE identified for the project.. However, there are Native American cultural resources in close proximity to the APE. Early consultation with Native American tribes in your area is the best way to avoid unanticipated discoveries once a project is underway. Enclosed are the names of the nearest tribes and interested Native American individuals that the NAHC recommends as 'consulting parties,' for this purpose, that may have knowledge of the religious and cultural significance of the historic properties in the project area (e.g. APE). We recommend that you contact persons on the attached list of Native American contacts. A Native American Tribe or Tribal Elder may be the only source of information about a cultural resource.. Also, the NAHC recommends that a Native American Monitor or Native American culturally knowledgeable person be employed whenever a professional archaeologist is employed during the 'Initial Study' and in other phases of the environmental planning processes.. Furthermore we suggest that you contact the California Historic Resources Information System (CHRIS) at the Office of Historic Preservation (OHP) Coordinator's office (at (916) 653-7278, for referral to the nearest OHP Information Center of which there are 11.

Consultation with tribes and interested Native American tribes and interested Native American individuals, as consulting parties, on the NAHC list ,should be conducted in compliance with the requirements of federal NEPA (42 U.S.C. 4321-43351) and Section 106 and 4(f) of federal NHPA (16 U.S.C. 470 [f)]*et se),* 36 CFR Part 800.3, the President's Council on Environmental Quality (CSQ; 42 U.S.C. 4371 *et seq.*) and NAGPRA (25 U.S.C. 3001-3013), as appropriate. The 1992 *Secretary of the Interior's Standards for the Treatment of Historic Properties* were revised so that they could be applied to all historic resource types included in the National Register of Historic Places and including *cultural landscapes.*

Lead agencies should consider avoidance, as defined in Section 15370 of the California Environmental Quality Act (CEQA) when significant cultural resources could be affected by a project. Also, Public Resources Code Section 5097.98 and Health & Safety Code Section 7050.5 provide for provisions for accidentally discovered archeological resources during construction and mandate the processes to be followed in the event of an accidental discovery of any human remains in a project location other than a 'dedicated cemetery. Discussion of these should be included in your environmental documents, as appropriate.

The authority for the SLF record search of the NAHC Sacred Lands Inventory, established by the California Legislature, is California Public Resources Code §5097.94(a) and is exempt from the CA Public Records Act (c.f. California Government Code §6254.10). The results of the SLF search are confidential. However, Native Americans on the attached contact list are not prohibited from and may wish to reveal the nature of identified cultural resources/historic properties. Confidentiality of "historic properties of religious and cultural significance' may also be protected the under Section 304 of the NHPA or at the Secretary of the Interior' discretion if not eligible for listing on the National Register of Historic Places. The Secretary may also be advised by the federal Indian Religious Freedom Act (cf. 42 U.S.C, 1996) in issuing a decision on whether or not to disclose items of religious and/or cultural significance identified in or near the APE and possibly threatened by proposed project activity.

SA-3-2

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. Although tribal consultation under the California Environmental Quality Act (CEQA; CA Public Resources Code Section 21000 – 21177) is 'advisory' rather than mandated, the NAHC does request 'lead agencies' to work with tribes and interested Native American individuals as 'consulting parties,' on the list provided by the NAHC in order that cultural resources will be protected. However, the 2006 SB 1059 the state enabling legislation to the Federal Energy Policy Act of 2005, does <u>mandate tribal consultation</u> for the 'electric transmission corridors. This is codified in the California Public Resources Code, Chapter 4.3, and §25330 to Division 15, requires consultation with California Native American tribes, and identifies both federally recognized and non-federally recognized on a list maintained by the NAHC

Health and Safety Code §7050.5, Public Resources Code §5097.98 and Sec. §15064.5 (d) of the California Code of Regulations (CEQA Guidelines) mandate procedures to be followed, including that construction or excavation be stopped in the event of an accidental discovery of

any human remains in a location other than a dedicated cemetery until the county coroner or medical examiner can determine whether the remains are those of a Native American. . Note that §7052 of the Health & Safety Code states that disturbance of Native American cemeteries is a felony.

Again, Lead agencies should consider avoidance, as defined in §15370 of the California Code of Regulations (CEQA Guidelines), when significant cultural resources are discovered during the course of project planning and implementation

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

SA-3-2

Sincerely,

Dave Singleton
Program Analyst

Attachment: List of Native American Contacts

Cc: State Clearinghouse

SA-3

DEPARTMENT OF TRANSPORTATION
DISTRICT 7, OFFICE OF PUBLIC
TRANSPORTATION AND REGIONAL PLANNING
IGR/CEQA BRANCH
100 SOUTH MAIN STREET
LOS ANGELES, CA 90012
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FAX (213) 897-1337

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July 16, 2010

IGR/CEQA DEIR CS/100627
County of Los Angeles
AV Solar Ranch One Project
Vic. LA-138-22.05, SCH# 2009041145

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e

Ms. Christina Tran
County of Los Angeles
Department of Regional Planning
320 West Temple Street
Los Angeles, CA 90012

Dear Ms. Tran:

Thank you for including the California Department of Transportation (Caltrans) in the environmental review process for the Draft Environmental Impact Report (DEIR) for the AV Solar Ranch One Project. The proposed project consists of a 230-megawatt (MW) solar photovoltaic (PV) facility on approximately 2,100 acres of former agricultural land in northern Los Angeles County along State Route 138 (SR-138). Based on the information received, we have the following comments:

SA-3-2

The project will need to conform to Caltrans System Planning State Route 138 (SR-138) Transportation Concept Report (TCR), route concept alternatives and Caltrans Project Study Report (PSR) to address projected operational deficiencies and facility concept for the impacted segment. Of concern would be the ultimate corridor concept for the impacted segment. The current facility includes one lane in each direction. Major development along the corridor including the Centennial Development Project will require widening to at least three lanes in each direction along portions of this corridor. The portion of State Route 138 along the project site will need to be widened to at least two lanes in each direction. Right-of-way dedication or sufficient set back of the project will be needed for future widening of the highway.

A Construction Management Plan will be needed for any lane closures including shoulders on State Route 138. Acceleration and deceleration lanes and the use of flagmen may be needed as a safety measure to mitigate the impact of construction traffic.

A Caltrans Encroachment Permit will be needed for any work to be performed within the State Right-of-way including installation of transmission lines across State Route 138. A traffic break will be required while installing an Arial transmission line across State Route 138. Plans will be needed showing the location and type of support structures.

SA-3

We recommend that construction related truck trips on State Highways be limited to off-peak commute periods. The contractor should avoid platooning of truck trips on mainline freeways, on conventional State Highways, on freeway ramps, and at freeway ramp intersections. Transport of over-size or over-weight vehicles on State Highways will need a Caltrans Transportation Permit.

A Stormwater Management Plan will be needed to control the discharge of stormwater runoff from the project site. Best Management Practices (BMPs) will need to be implemented to assure the clean discharge of stormwater runoff.

If you have any questions regarding our comments, you may reach me at (213) 897-1726 and please refer to our record number 100627/CS.

SA-3-2

Sincerely,

Carl Shiigi
IGR/CEQA Coordinator
Office of Regional Planning

cc: Scott Morgan, State Clearinghouse

4.3 LOCAL AGENCIES

Comment letters from local agencies and corresponding Written Responses to Comments follow for the following local agency letters:

- Los Angeles County Sheriff Department (LA-1)
- Los Angeles County Fire Department (LA-2)
- City of Palmdale (LA-3)
- Antelope Valley Air Quality Management District (LA-4)

Written Responses to Los Angeles County Sheriff Department (LA-1)

Response LA-1-1:

Comment identifies the comment letter is transmitted in response to the Notice of Completion and Availability of the Draft EIR for the Project. No response is required.

Response LA-1-2:

Comment identifies the Lancaster Station as the reviewing entity, and refers to two attached letters dated June 30, 2010 and February 8, 2010 indicating that no anticipated significant impacts and no mitigation measures are required or requested of the Project. The Station has no additional comments to submit at this time, but reserves the right to address this matter in subsequent reviews of the proposed Project. Therefore, no response is required. However, the comment is acknowledged for the record and will be forwarded to the decision-making bodies for their review and consideration.

LA-1

County of Los Angeles
Sheriff's Department Headquarters
4700 Ramona Boulevard
Monterey Park, California 91754-2169

Leroy D. Baca, Sheriff

RECEIVED
JUL 14 2010

July 9, 2010

Ms. Christina Tran
Department of Regional Planning
Impact Analysis Section, Room 1348
320 West Temple Street
Los Angeles, California 90012

Dear Ms. Tran:

REVIEW COMMENTS
DRAFT ENVIRONMENTAL IMPACT REPORT FOR THE
ANTELOPE VALLEY SOLAR RANCH ONE PROJECT (10-045)

This letter is transmitted in response to your Notice of Completion and Availability (NOCA) on the Draft Environmental Impact Report (DEIR) for the Antelope Valley Solar Ranch One Project (Project). The proposed Project consists of a 230-megawatt alternating current solar photovoltaic (PV) facility of approximately 1,955 acres in the Antelope Valley, approximately 15 miles northwest of downtown Lancaster. Components of the proposed Project include PV panel arrays, an electrical substation, a 20,000-square foot operations and maintenance building, parking and drainage facilities. LA-1-1

The Lancaster Station (Station) of the Los Angeles County Sheriff's Department (LASD) has reviewed the DEIR for the proposed Project. The Station's comments are contained in the attached correspondence, dated June 30, 2010, from Captain Axel H. Anderson. -2

In summary, the Station's position on the proposed Project has not changed over previous Project reviews. The Station refers specifically to prior comments contained in correspondence dated February 8, 2010 and submitted to L.A. County Department of

LA-1

Regional Planning on or about February 23, 2010 (no anticipated significant impacts; no mitigation measures required or requested). Although the Station has no additional comments to submit at this time, the Station reserves the right to address this matter in subsequent reviews of the proposed Project.

Thank you for including LASD in the environmental review process for the proposed Project. -2

Should you have any additional questions regarding this matter, please contact Mr. Lester Miyoshi, of my staff at (626) 300-3012, and refer to FPB Tracking No. 10-045. Mr. Miyoshi may also be contacted via e-mail, at lhmiyosh@lasd.org.

Sincerely,

LEROY D. BACA, SHERIFF

Gary T.K. Tse, Director
Facilities Planning Bureau

SH-AD-32A (6/94)

COUNTY OF LOS ANGELES

LA-1

SHERIFF'S DEPARTMENT

DATE 06/30/2010

OFFICE CORRESPONDENCE

FILE NO.

FROM: Axel H. Anderson, Captain
Lancaster Station

TO: Mr. Lester Miyoshi
Facilities Planning Bureau

SUBJECT: Antelope Valley Solar Ranch One Project

We have received your request for comments dated June 22, 2010, regarding the Environmental Impact Report for the Antelope Valley Solar Ranch One Project.

Our position as reported in our letter dated February 8, 2010 has not changed This project will not significantly impact the Los Angeles County Sheriff's Department, and we are not requiring or requesting any mitigation measures. -2

If we can be of further assistance, feel free to contact Deputy Michael Kuper, Monday through Friday, 8:00 a.m. to 4:00 p.m., 661-948-8466, extension 4021.

LA-1

County of Los Angeles
Sheriff's Department Headquarters

4700 Ramona Boulevard
Monterey Park, California 91754-2169

Leroy D. Baca, Sheriff

(661) 948-8466

February 8, 2010

Chin U. Kim, Facilities Project Manager II
Facilities Planning Bureau
1000 South Fremont Avenue, Unit 47
Alhambra, California 91803

Subject: AV Solar Ranch One Project

Dear Mr. Kim:

We have reviewed the Screencheck Environmental Impact Report regarding Sheriff's Services, Section 5.13 through Section 5.13.2.1.2., related to the project.

We concur with the information provided in the report. This project will not significantly impact the Los Angeles County Sheriff's Department, and we are not requiring or requesting any mitigation measures. -2

If we can be of further assistance, feel free to contact Deputy Michael Kuper, Monday through Friday, 8:00 a.m. to 4:00 p.m., (661) 948-8466, extension 4021.

Sincerely,

LEROY D. BACA, SHERIFF

Axel H. Anderson, Captain
Lancaster Station

Written Responses to Los Angeles County Fire Department (LA-2)

Response LA-2-1:

Comment identifies that the County of Los Angeles Fire Department Planning Division, Land Development Unit, Forestry Division, and Health Hazardous Materials Division reviewed the Draft EIR and provided comments. No response is required.

Response LA-2-2:

Comment states that the Planning Division has no comments at this time. Therefore, no response is required.

Response LA-2-3:

Comment states that the Fire Prevention Division Land Development Unit has no additional comments, and conditions addressed in the attached Project TR71035 (May 19, 2010), which states Project clearance for public hearings, and CUP R2009-02239 (March 1, 2010) providing conditions of approval, have not been changed. Thus, no response is required for this comment and the attached two letters (identified as LA-2-6). However, the comment is acknowledged for the record and will be forwarded to the decision-making bodies for their review and consideration.

Response LA-2-4:

Comment states the statutory responsibilities of the County of Los Angeles Fire Department, Forestry Division include erosion control, watershed management, rare and endangered species, vegetation, fuel modification for Very High Fire Hazard Severity Zones or Fire Zone 4, archaeological and cultural resources, and the County Oak Tree Ordinance. Comment further states that the areas germane to the statutory responsibilities of the County of Los Angeles Fire Department, Forestry Division have been addressed. Thus, no response is required.

Response LA-2-5:

Comment states that the Health Hazardous Materials Division Site Mitigation Unit is overseeing site investigation/mitigation activities at the AV Solar Ranch site, and upon completion of the activities, a “No Further Action Letter” will be issued. No response is required. However, the comment is acknowledged for the record and will be forwarded to the decision-making bodies for their review and consideration.

Response LA-2-6:

Refer to Response LA-2-3.

LA-2

COUNTY OF LOS ANGELES

FIRE DEPARTMENT

1320 NORTH EASTERN AVENUE
LOS ANGELES, CALIFORNIA 90063-3294

(323) 890-4330

RECEIVED
JUL 20 2010

P. MICHAEL FREEMAN
FIRE CHIEF
FORESTER & FIRE WARDEN

July 15, 2010

Christina Tran
Department of Regional Planning
Impact Analysis Section
320 West Temple Street
Los Angeles, CA 90012

Dear Ms. Tran:

DRAFT ENVIRONMENTAL IMPACT REPORT, NOC & AVAILABILITY DRAFT EIR REPORT FOR THE AV SOLAR RANCH ONE PROJECT, STATE CLEARINGHOUSE # 2009041145, COUNTY PROJECT # R2009-02239, VESTING TENTATIVE TRACT MAP # TR071035, CONDITIONAL USE PERMIT # RCUPT200900026, ENVIRONMENTAL REVIEW # RENVT200900027, ANTELOPE VALLEY (FFER #201000116)

The Draft Environmental Impact Report has been reviewed by the Planning Division, Land Development Unit, Forestry Division, and Health Hazardous Materials Division of the County of Los Angeles Fire Department. The following are their comments: LA-2-1

PLANNING DIVISION: -2

1. We have no comments at this time.

LAND DEVELOPMENT UNIT: -3

1. The Fire Prevention Division Land Development Unit has no additional comments regarding this project. The conditions addressed in projects TR71035 dated March 1, 2010, and CUP R2009-02239 dated May 19, 2010, have not been changed at this time.

2. Should any questions arise regarding subdivision, water systems, or access, please contact the County of Los Angeles Fire Department, Land Development Unit, EIR Inspector, Scott Jaeggi at (323) 890-4243.

FORESTRY DIVISION – OTHER ENVIRONMENTAL CONCERNS:

1. The statutory responsibilities of the County of Los Angeles Fire Department, Forestry Division includes erosion control, watershed management, rare and endangered species, vegetation, fuel modification for Very High Fire Hazard Severity Zones or Fire Zone 4, archeological and cultural resources, and the County Oak Tree Ordinance. -4

2. The areas germane to the statutory responsibilities of the County of Los Angeles Fire Department, Forestry Division have been addressed.

HEALTH HAZARDOUS MATERIALS DIVISION:

1. Health Hazardous Materials Division Site Mitigation Unit is overseeing site investigation/mitigation activities at AV Solar Ranch. Upon completion of the activities a "No Further Action Letter" will be issued. -5

If you have any additional questions, please contact this office at (323) 890-4330.

Very truly yours,

Frank Vidales

for JOHN R. TODD, CHIEF, FORESTRY DIVISION
PREVENTION SERVICES BUREAU

JRT:ss

Enclosures

LA-2

COUNTY OF LOS ANGELES
FIRE DEPARTMENT

5823 Rickenbacker Road
Commerce, California 90040-3027

DATE: May 19, 2010

TO: Department of Regional Planning
Permits and Variances

PROJECT #: R2009-02239 (CUP T200900026)

LOCATION: AV Solar Ranch One - North and South of SR 138 between 155th St. W. and 180th St. W., Antelope Valley

☒ **Comments:** THIS PROJECT IS CLEARED BY THE FIRE DEPARTMENT FOR PUBLIC HEARING.

☒ **Water:** THE FOLLOWING ITEMS SHALL BE PROVIDED DURING THE BUILDING PLAN CHECK PHASE AND APPROVED BY THE FIRE PREVENTION ENGINEERING SECTION:

1. Water storage requirements for the Operations & Maintenance Building shall be determined in accordance with NFPA 13 and NFPA 1142. The higher yield of water shall be provided (10,000 gallon minimum) in a water storage tank with a draft fire hydrant near the entrance to the facility.
2. An additional water storage tank (10,000 gallon minimum) shall be provided to serve the south quadrant of the project and shall be located near the entrance from 170th Street West. Said tank shall include a draft fire hydrant.

☒ **Access:** THE FOLLOWING ITEMS SHALL BE PROVIDED DURING THE BUILDING PLAN CHECK PHASE AND APPROVED BY THE FIRE PREVENTION ENGINEERING SECTION:

1. Paved fire apparatus access as depicted on the plan labeled "Operations & Maintenance Facility Area" is adequate. Said plan is dated 05-05-2010, and is on file in the LDU office.
2. All weather fire apparatus access to the solar array field and equipment as depicted on the plan labeled "Solar Field Detail" is adequate. Said plan is dated 05-05-2010, and is on file in the LDU office.

☒ **Special Requirements:**

1. The plan labeled "Vegetation Management and Fire Control" is adequate. Said plan is dated 05-05-2010, and is on file in the LDU office.
2. Provide perimeter fencing around entire project to prevent debris collection underneath solar panels.
3. Provide automatic fire extinguishing systems in all unmanned electrical transformer type buildings.
4. Provide electrical disconnects in accordance with the State of California photovoltaic guidelines and requirements.
5. This project shall comply with LACoFD "Regulation 27 - Requirements for Building Construction and Land Use Within or Adjacent to High Voltage Transmission Lines".
6. All fire access gates shall comply with LACoFD "Regulation 5 - Limited Access Devices and Systems".

Fire Protection facilities; including access must be provided prior to and during construction. Should any questions arise regarding this matter, please feel free to call our office at (323) 890-4243

Inspector: ***SCOTT JAEGGI***

Land Development Unit – Fire Prevention Division – Office (323) 890-4243 Fax (323) 890-9783

COUNTY OF LOS ANGELES
FIRE DEPARTMENT

5823 Rickenbacker Road
Commerce, California 90040

LA-2

CONDITIONS OF APPROVAL FOR SUBDIVISION - UNINCORPORATED

Project No: R2009-02239 (TR 71035) Map Date: March 01, 2010

C.U.P. T200900026 Vicinity: 09A5

☐ **FIRE DEPARTMENT HOLD** on the tentative map shall remain until verification from the Los Angeles County Fire Dept. Planning Section is received, stating adequacy of service. Contact (323) 881–2404.

☒ Access shall comply with Title 21 (County of Los Angeles Subdivision Code) and Section 503 of the Fire Code, which requires all weather access. All weather access may require paving.

☒ Fire Department access shall be extended to within 150 feet distance of any exterior portion of all structures.

☒ Where driveways extend further than 150 feet and are of single access design, turnarounds suitable for fire protection equipment use shall be provided and shown on the final map. Turnarounds shall be designed, constructed and maintained to insure their integrity for Fire Department use. Where topography dictates, turnarounds shall be provided for driveways that extend over 150 feet in length.

☐ The private driveways shall be indicated on the final map as "Private Driveway and Firelane" with the widths clearly depicted. Driveways shall be maintained in accordance with the Fire Code.

☐ Vehicular access must be provided and maintained serviceable throughout construction to all required fire hydrants. All required fire hydrants shall be installed, tested and accepted prior to construction.

☐ This property is located within the area described by the Fire Department as "Very High Fire Hazard Severity Zone" (formerly Fire Zone 4). A "Fuel Modification Plan" shall be submitted and approved prior to the Public Hearing. (Contact: Fuel Modification Unit, Fire Station #32, 605 North Angeleno Avenue, Azusa, CA 91702-2904, Phone (626) 969-5205 for details).

☒ Provide Fire Department or City approved street signs and building access numbers prior to occupancy.

☐ Additional fire protection systems shall be installed in lieu of suitable access and/or fire protection water.

☐ The final concept map, which has been submitted to this department for review, has fulfilled the conditions of approval recommended by this department for access only.

☐ These conditions must be secured by a C.U.P. and/or Covenant and Agreement approved by the County of Los Angeles Fire Department prior to final map clearance.

☒ The Fire Department has no additional requirements for this division of land.

Comments: **Fire Department access requirements will be determined with the CUP review (Permit Number T200900026).**

By Inspector: Juan C. Padilla Date March 23, 2010

Land Development Unit – Fire Prevention Division – (323) 890-4243, Fax (323) 890-9783

COUNTY OF LOS ANGELES
FIRE DEPARTMENT

LA-2

5823 Rickenbacker Road
Commerce, California 90040

WATER SYSTEM REQUIREMENTS - UNINCORPORATED

Project No: R2009-02239 (TR 71035) Map Date: March 01, 2010

C.U.P. T200900026

☒ The County Forester and Fire Warden is prohibited from setting requirements for water mains, fire hydrants and fire flows as a condition of approval for this division of land as presently zoned and/or submitted. However, water requirements may be necessary at the time of building permit issuance.

☐ The required fire flow for public fire hydrants at this location is ____ gallons per minute at 20 psi for a duration of __ hours, over and above maximum daily domestic demand. __ Hydrant(s) flowing simultaneously may be used to achieve the required fire flow.

☐ The required fire flow for private on-site hydrants is ____ gallons per minute at 20 psi. Each private on-site hydrant must be capable of flowing ____ gallons per minute at 20 psi with two hydrants flowing simultaneously, one of which must be the furthest from the public water source.

☐ Fire hydrant requirements are as follows:

Install ____ public fire hydrant(s). Verify / Upgrade existing ____ public fire hydrant(s).

Install ____ private on-site fire hydrant(s).

☐ All hydrants shall measure 6"x 4"x 2-1/2" brass or bronze, conforming to current AWWA standard C503 or approved equal. All on-site hydrants shall be installed a minimum of 25' feet from a structure or protected by a two (2) hour rated firewall.
☐ Location: As per map on file with the office.
☐ Other location: ____

☐ All required fire hydrants shall be installed, tested and accepted or bonded for prior to Final Map approval. Vehicular access shall be provided and maintained serviceable throughout construction.

☐ The County of Los Angeles Fire Department is not setting requirements for water mains, fire hydrants and fire flows as a condition of approval for this division of land as presently zoned and/or submitted.

☒ Additional water system requirements will be required when this land is further subdivided and/or during the building permit process.

☐ Hydrants and fire flows are adequate to meet current Fire Department requirements.

☐ Fire hydrant upgrade is not necessary, if existing hydrant(s) meet(s) fire flow requirements. Submit original water availability form to our office.

Comments: **Fire Department water requirements will be determined with the CUP review (Permit Number T200900026).**

All hydrants shall be installed in conformance with Title 20, County of Los Angeles Government Code and County of Los Angeles Fire Code, or appropriate city regulations. This shall include minimum six-inch diameter mains. Arrangements to meet these requirements must be made with the water purveyor serving the area.

By Inspector Juan C. Padilla Date March 23, 2010

Land Development Unit – Fire Prevention Division – (323) 890-4243, Fax (323) 890-9783

Written Responses to City of Palmdale (LA-3)

Response LA-3-1:

Comment states the City of Palmdale has reviewed the Draft EIR, and that the City has no comment on the proposed Project. Therefore, no response is required. However, the comment is acknowledged for the record and will be forwarded to the decision-making bodies for their review and consideration.

LA-3

PALMDALE

a place to call home

July 15, 2010

JAMES C. LEDFORD, JR.
Mayor

TOM LACKEY
Mayor Pro Tem

LAURA BETTENCOURT
Councilmember

MIKE DISPENZA
Councilmember

STEVEN D. HOFBAUER
Councilmember

38300 Sierra Highway

Palmdale, CA 93550-4798

Tel: 661/267-5100

Fax: 661/267-5122

TDD: 661/267-5167

Ms. Christina Tran
Los Angeles County
Department of Regional Planning
Impact Analysis Section, Room 1348
320 West Temple Street
Los Angeles, CA 90012

RE: Notice of Completion for AV Solar Ranch One Array Project: A 230 MW Solar Photovoltaic Facility on 2,100 Acres Located Generally North and South of SR-138 Between 155th Street West and 180th Street West (SCH No. 2009041145)

Dear Ms. Tran:

Thank you for the opportunity to review the above referenced Draft Environmental Impact Report. Staff has reviewed the document and at this time, the City of Palmdale has no comment on the proposed project. LA-3-1

If you have any questions regarding this matter, please contact Susan Koleda or me at (661) 276-5200.

Sincerely,

Richard Kite
Assistant Director of Planning

RK:sk

Auxiliary aids provided for communication accessibility upon 72 hours' notice and request.

JUL 21 2010

Written Responses to Antelope Valley Air Quality Management District (LA-4)

Response LA-4-1:

Comment states the Antelope Valley Air Quality Management District (AVAQMD) received and reviewed the Draft EIR for the proposed Project. No response is required.

Response LA-4-2:

Draft EIR Section 5.6.5 acknowledges the required fugitive dust best management practices, including compliance with AVAQMD Rule 403, and submittal of a Fugitive Dust Emission Control Plan (as addressed in Mitigation Measure 5.6-2) for construction work. The Fugitive Dust Emission Control Plan, as stated in Mitigation Measure 5.6-2 of the Draft EIR Section 5.6.5, requires stabilization of on-site roadways. In addition to these fugitive dust control measures, the Draft EIR identifies Mitigation Measure 5.6-3 (Dust Plume Response Requirement) and Mitigation Measure 5.6-5 (Limit Vehicle Traffic and Equipment Use) for further fugitive dust management measures.

Response LA-4-3:

The attachment is the Notice of Completion and Availability of the Draft EIR for the AV Solar Ranch One Project. No response is required.

LA-4

Antelope Valley Air Quality Management District
43301 Division St., Suite 206
Lancaster, CA 93535-4649

661.723.8070
Fax 661.723.3450

Eldon Heaston, Executive Director

July 20, 2010

Christina Tran
Department of Regional Planning
320 West Temple Street
Los Angeles, CA 90012

RE: Draft Environmental Impact Report (DEIR) for AV Solar Ranch One Project

Ms. Tran:

The Antelope Valley Air Quality Management District (District) has received and reviewed the DEIR for the proposed 2,100 acre AV Solar Ranch One photovoltaic solar energy project located in the Antelope Valley within the unincorporated Los Angeles County, approximately 15 miles northwest of downtown Lancaster (West Avenue D) within Sections 11, 13, 14 and 24 in Township 8 North, Range 15 West, and within Section 18 in Township 8 North, Range 14 West. LA-4-1

Based on the information provided in the DEIR, the District recommends Los Angeles County to require fugitive dust best management practices (including but not limited to submittal of a Dust Control Plan and compliance with the provisions of District Rule 403) be implemented in the grading and construction phases of the project, and that access and maintenance roads be stabilized. -2

Thank you for the opportunity to review this planning document. If you have any questions regarding this letter, please contact me at (661) 723-8070 x2.

Sincerely,

Bret Banks
Operations Manager

BB/jm

AV Solar Ranch One.doc

Printed on recycled paper

Clean Cities
Antelope Valley

LA-4

Los Angeles County
Department of Regional Planning

Planning for the Challenges Ahead

Richard J. Bruckner
Director

NOTICE OF COMPLETION AND AVAILABILITY
DRAFT ENVIRONMENTAL IMPACT REPORT FOR THE
AV SOLAR RANCH ONE PROJECT
STATE CLEARINGHOUSE NO. 2009041145
COUNTY PROJECT NO. R2009-02239
VESTING TENTATIVE TRACT MAP NO. TR071035
CONDITIONAL USE PERMIT NO. RCUPT200900026
ENVIRONMENTAL REVIEW NO. RENVT200900027

The County of Los Angeles, acting in the capacity of Lead Agency under the California Environmental Quality Act (CEQA) and the County Environmental Document Reporting Procedures and Guidelines, Chapter III, Section 304, has filed a "Notice of Completion" of a Draft Environmental Impact Report (DEIR) for the **AV Solar Ranch One Project**. This DEIR has been prepared in accordance with, and pursuant to CEQA, Public Resources Code, Section 21000-21178; the "Guidelines for California Environmental Quality Act" (State CEQA Guidelines), and California Code of Regulation, Title 14, Chapter 3, Section 15000-15387.

PROPOSED PROJECT AND SITE LOCATION

The proposed AV Solar Ranch One Project (Project) site is located in the Antelope Valley, in unincorporated Los Angeles County, approximately 15 miles northwest of downtown Lancaster. The Project site can be accessed from Interstate 5 or State Route 14 via State Route 138 (West Avenue D) from the west and east, respectively. The Project site consists of approximately 2,100 acres, occupies an area both north and south of SR-138, and is approximately bounded on the north by West Avenue B-8, on the south by West Avenue E, on the east by 155th Street West and on the west by 180th Street West. The Project site was used for agricultural production from approximately the 1950s through 2004. The Project site includes a residential ranch area that will be removed as part of the solar field construction.

The proposed Project consists of a 230-MW alternating current (AC) solar photovoltaic ("PV") facility that would involve development of approximately 1,955 acres within the overall Project site. Major Project components include PV panel arrays, an electrical substation, a 20,000 square-foot Operations and Maintenance building with associated parking, and on-site drainage improvements consisting primarily of infiltration basins throughout the site. The proposed Project components also include perimeter fencing (wildlife-permeable), fire breaks, perimeter and internal access roads, a water well, two water tanks (approximately 100,000 and 10,000 gallons), and a septic system. The Project also includes an overhead 230-kV transmission line, approximately 4.25 miles long (0.75 mile on-site and 3.5 miles off-site), that is proposed to run along the public ROW of 170th Street West and adjacent private property to interconnect to Southern California Edison's planned Whirlwind Substation north of the Project site in southern Kern County.

REVIEWING LOCATIONS

The formal public review period for the DEIR will be from **June 16, 2010 to July 30, 2010 (45 days).** A public hearing on the DEIR and the proposed Project has been scheduled before the Los Angeles County Regional Planning Commission at 9:00 a.m. on **Wednesday, June 30, 2010,** in the Regional Planning Commission Hearing Room, 320 West Temple Street, Los Angeles, CA 90012. All comments received by the closing of the public review period for the DEIR will be considered in the Final EIR. To ensure public access to the DEIR, copies of the document are available for review online at http://planning.lacounty.gov/case/all (listed under County Project No. R2009-02239) and at the libraries listed below:

Quartz Hill County Library
42018 N. 50th St. W
Quartz Hill, CA 93536 (661) 943-2454

Lancaster County Library
601 W. Lancaster Blvd.
Lancaster, CA 93534 (661) 948-5029

Canyon Country Jo Anne Darcy Library
18601 Soledad Canyon Road
Santa Clarita, CA 91351 (661) 251-2720

Lake Los Angeles Library
16921 East Avenue O, #A
Palmdale, CA 93591, CA (661) 264-0593

Antelope Valley Bookmobile
601 W. Lancaster Blvd.
Lancaster, CA 93534 (661) 948-5029

-3

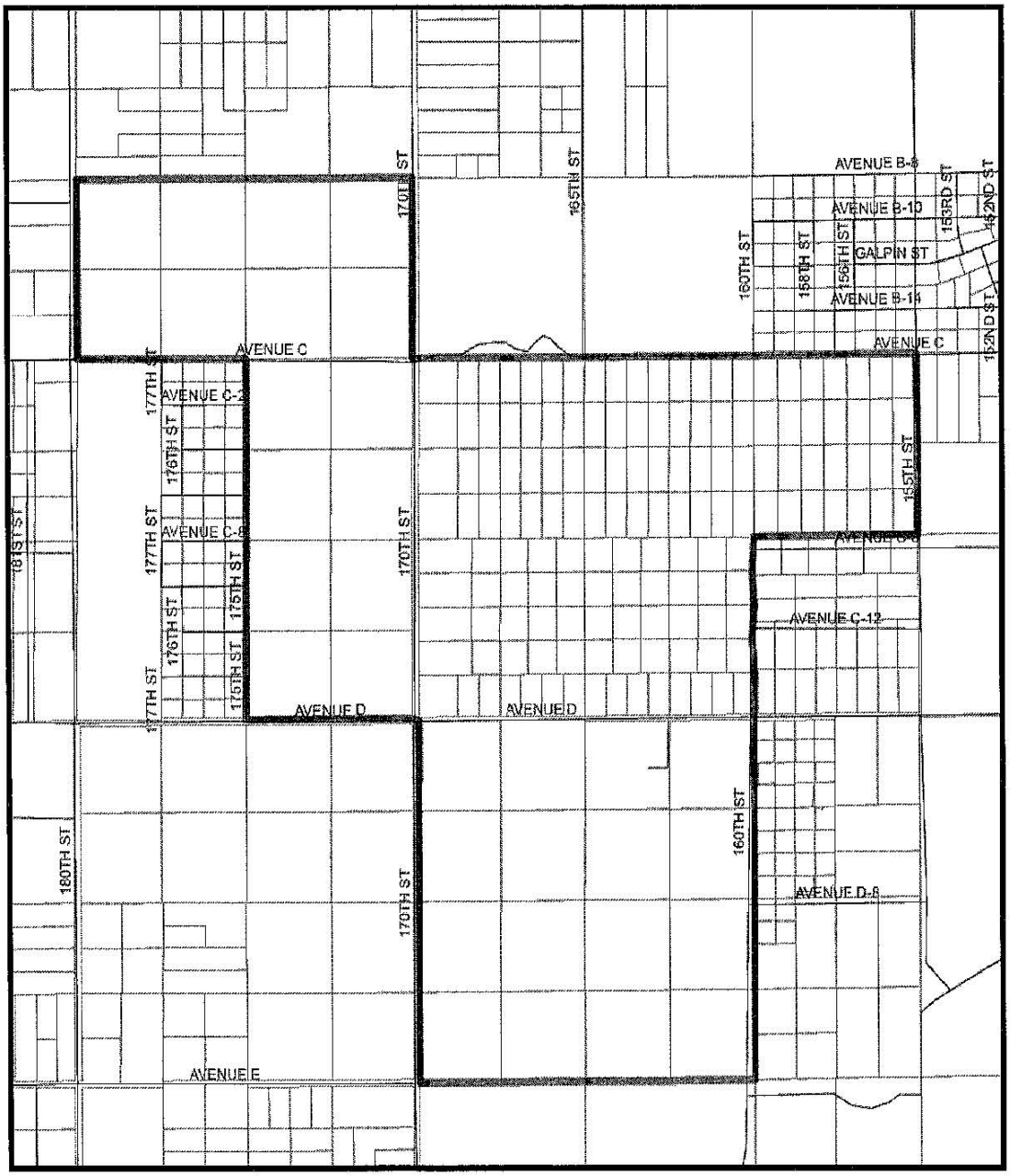
Copies of the DEIR and documents referenced in the DEIR will also be available for public review Monday through Thursday, 7:30 a.m. to 5:30 p.m. at:

Los Angeles County
Department of Regional Planning
Impact Analysis Section, Room 1348
320 West Temple Street
Los Angeles, CA 90012
(213) 974-6461

Please submit written comments on the DEIR to **Christina Tran** of the Department of Regional Planning at the address above, or via email at ctran@planning.lacounty.gov

VICINITY MAP BELOW

AV Solar Ranch One Site



-3

4.4 ORGANIZATIONS

Comment letters from organizations and corresponding Written Responses to Comments follow for the following Organization (ORG) letters:

- Antelope Valley Group of Sierra Club (ORG-1)
- Adams Broadwell Joseph & Cardozo (July 21, 2010) (ORG-2)
- Adams Broadwell Joseph & Cardozo (July 30, 2010) (ORG-3)
    - Attachment A (Matt Hagemann, July 29, 2010) (ORG-3A)
    - Attachment B (James Cornett, July 28, 2010) (ORG-3B)
    - Attachments C through J (reference materials)(ORG-3C through ORG-3J)

Written Responses to Antelope Valley Group of Sierra Club (ORG-1)

Response ORG-1-1:

Comment states that the Antelope Valley Group of the Sierra Club (AV Sierra Club) supports using disturbed agricultural land and employing low-water-use photovoltaic technology to supply renewable energy. The comment states that the Project will have little negative visual effect on the California Poppy Reserve, and that the AV Sierra Club appreciates the Project modification to avoid overlap with the designated Significant Ecological Areas. This comment does not state a specific concern or question regarding the adequacy of the analysis contained in the Draft EIR. Therefore, a response is not required pursuant to CEQA. However, the comment is acknowledged for the record, and will be forwarded to the decision-making bodies for their review and consideration.

Response ORG-1-2:

This comment expresses an opinion regarding the Project alternatives, but does not raise a specific concern or question regarding the adequacy of the analysis contained in the Draft EIR. Therefore, a response is not required pursuant to CEQA. However, it should be noted that Mitigation Measure 5.7-2, Off-site Mitigation for Loss of Habitat (as modified; see Section 2.0, Revisions to the Draft EIR in this Final EIR) requires that mitigation land shall be acquired and preserved in the vicinity of the Antelope Valley California Poppy Reserve, including lands in or adjacent to SEA #57 or SEA #60, lands connecting the Poppy Reserve to the Angeles National Forest, or lands adjacent to the Arthur B. Ripley Woodland State Park. This comment is acknowledged for the record and will be forwarded to the decision-making bodies for their review and consideration.

Response ORG-1-3:

As discussed in Draft EIR Section 4.6, the Draft EIR established a reasonably foreseeable cumulative project scenario at the time of the Project Notice of Preparation (CEQA Guidelines Section 15125 subd. (a)) in April of 2009 by considering: active projects lists from LACDRP, Kern County Planning Department, City of Lancaster, California Energy Commission, the California Independent System Operator interconnection queue, and the U.S. Bureau of Land Management; planning documents that incorporate long-range growth projections, including general plans, area plans, specific plans, and Southern California Association of Governments growth projections; and other planning documents, such as previously certified EIRs. The cumulative projects list was also updated in September of 2009 during preparation of the Draft EIR. The Draft EIR considers and assesses the proposed Fairmont Butte Motorsports Park Project in the cumulative project scenario; however, as of September of 2009 no active project applications were identified or available for wind or solar projects near the Antelope Valley California Poppy Reserve. As analyzed in the Draft

EIR, the AV Solar Ranch One Project would result in less than significant incremental contributions to cumulative traffic (Draft EIR Section 5.11.4) and noise (Draft EIR Section 5.18.4).

Construction of the Project would require a temporary workforce with a peak of approximately 453 workers, and operation of the Project would result in approximately 16 permanent employees. Many of the workers are expected to be hired locally. Due to the nature of the Project (i.e., solar electric generating facility with an approximately 3.5-mile-long, privately-owned off-site transmission line, and small operational workforce needs) and large regional workforce available, the Project would not result in an influx of population and growth (Draft EIR Section 7.2) that would spawn small businesses. In consideration of these Project attributes as well as the Project's passive operating nature and implementation of mitigation measures, the Project would not significantly change the nature of the area.

Response ORG-1-4:

The commenter's suggestion for a joint cooperative association to help maintain remaining open space areas in the Antelope Valley does not pertain to the adequacy of the impact assessments or conclusions in the Draft EIR. Therefore, a response is not required pursuant to CEQA. However, as stated in Response ORG-1-2, the AV Solar Ranch One Project would purchase and preserve lands having desired natural habitat value in areas to promote continuity with existing natural areas and open spaces (for instance, SEAs, Antelope Valley California Poppy Reserve, Angeles National Forest, and Arthur B. Ripley Woodland State Park), which would mitigate for Project impacts. This comment is acknowledged for the record and will be forwarded to the decision-making bodies for their review and consideration.

Response ORG-1-5:

Comment suggests that a set of Los Angeles County plans should be developed for maintaining open spaces, while allowing for solar and wind facilities. Comment suggests that these plans should involve using mitigated lands acquired from the development of these facilities and should be developed cooperatively by cities, town councils, environmental groups, land conservancies, developers, California State Parks, and Los Angeles County. This comment does not address the adequacy of the Draft EIR. Therefore, a response is not required pursuant to CEQA. This comment is acknowledged for the record and will be forwarded to the decision-making bodies for their review and consideration. Also, refer to Response ORG-1-4.

From: Katherine Allen [kj.allen@wildblue.net] **Sent:** Friday, July 30, 2010 11:47 AM **To:** Tran, Christina **Subject:** Comment Letter on Solar Ranch One Project

ORG-1

July 30, 2010

Christina Tran Los Angeles County Department of
Regional Planning Impact Analysis Section, Room 1348
320 West Temple Street Los Angeles, CA 90012

Subject: DEIR for AV Solar Ranch
One County Project No. R2009-02239

The Antelope Valley Group of the Sierra Club (AV Sierra Club) supports using disturbed agricultural land and employing low-water-use photovoltaic technology to supply renewable energy. Additionally, the project will have little negative visual effect on the nearby California Poppy Reserve and we appreciate that Solar Ranch has worked with the Reserve staff on this. We also appreciate that the proposed project was modified to avoid overlap with designated Significant Ecological Areas. ORG-1-1

While the AV Sierra Club favors the implementation of Alternative 2, which would increase the development setback from both SEAs and from drainage C, we understand that Solar Ranch considers this not economically feasible, as the company would not be able to meet its contractual obligations to PG&E. Alternative 3 would be desirable because it reduces the visual and auditory impacts of transmissions lines, however, we would suggest that the environmental impact and expense would be such that a more overall environmentally positive solution would be to purchase and protect lands in SEAs 57 & 60, near the Poppy Reserve and Ripley Desert Woodlands. -2

We also have concerns about the "cumulative environmental impacts" on the region, This project in addition to the many other proposed solar and wind farms around the Poppy Reserve plus a proposed racetrack about a half-mile to the west, will change the nature of the area. These developments will spawn additional street traffic, noise, and small business along the local paved roads. The combination of all these developments points to a need for a joint cooperative association to help maintain remaining open space areas in the Antelope Valley. A set of LA County plans should be developed for maintaining open spaces, while allowing for solar and wind facilities. These plans should involve using mitigated lands acquired from the development of these facilities and should be developed cooperatively by cities, town councils, environmental groups, land conservancies, developers, CA State Parks, and LA County. -3 -4 -5

Kate Allen Chair, AV Group of
the Sierra Club

Written Responses to Adams Broadwell Joseph & Cardozo (Letter Dated July 21, 2010) (ORG-2)

Response ORG-2-1:

This comment letter and attachments were responded to in a response letter dated July 29, 2010 from Mr. Kim Szalay (Los Angeles County Department of Regional Planning). A copy of the response letter follows. The comment letter requests for access to the Project public records, which the County had provided prior to the close of the public comment period. Additionally, for clarification, delivery records indicate that both the Notice of Completion and Availability and Draft EIR CD were delivered and personally received at the commenter's location on June 15, 2010, instead of the commenter's claim that the Notice arrived on June 17, 2010. Contrary to the commenter's claim, the Notice of Completion and Availability was prepared in accordance with CEQA Guidelines Section 15085 and Section 15087. The Draft EIR was circulated in accordance with CEQA Guidelines 15105 for the public review period, and the County has demonstrated substantial compliance with the public notice requirements under CEQA (Public Resources Code, Section 21092). Therefore, the comment letter's request for an extension of the Draft EIR public comment period is not warranted.

Los Angeles County
Department of Regional Planning

Planning for the Challenges Ahead

Richard J. Bruckner
Director

RESPONSE TO ORG-2

July 29, 2010

Adams Broadwell Joseph and Cardozo
Attention: Elizabeth Klebaner
601 Gateway Boulevard, Suite 1000
South San Francisco, CA 94080-7037

Re: Public Records Request and Request for an Extension to the Public Hearing for the AV Solar Ranch One Project.

Dear Ms. Klebaner,

In response to your July 21, 2010 public records request and request for an extension to the public hearing for the AV Solar Ranch One Project, staff of the Los Angeles County Department of Regional Planning provided the requested materials prior to the close on July 30, 2010 of the public comment period on the subject Draft Environmental Impact Report. Additionally, staff provided a response to the request for extension of the public hearing on the subject project.

Attached are copies of the July 21, 2010 requests and e-mail responses indicating fulfillment of the public records request and a response to the request for an extension to the subject public hearing.

Sincerely,

Kim K. Szalay, MPL, AICP
Principal Regional Planning Assistant

Attachments: July 21, 2010 request with its attachments
E-mails indicating responses to requests

320 West Temple Street ▪ Los Angeles, CA 90012 ▪ 213-974-6411 ▪ Fax: 213-626-0434 ▪ TDD: 213-617-2292

ORG-2

ADAMS BROADWELL JOSEPH & CARDOZO
A PROFESSIONAL CORPORATION
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RACHAEL E. KOSS
LOULENA A. MILES
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TEL: (916) 444-6201
FAX: (916) 444-6209

July 21, 2010

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BY FACSIMILE AND U.S. MAIL

Richard Bruckner, Director of Planning
LA County Department of Regional Planning
1390 Hall of Records
320 West Temple Street
Los Angeles, CA 90012
Fax: (213) 974-6384

Public Information Officer
Kenneth Hahn Hall of Administration
500 W. Temple Street, Room 358
Los Angeles, CA 90012
Fax: (213) 680-1122

Kim K. Szalay, MPL, AICP
Principal Regional Planning Assistant
Los Angeles County Department of Regional Planning
320 W. Temple Street
Los Angeles, CA 90012
Fax: (213) 626-0434

Re: Public Records Act Follow Up Request and Request for Extension of CEQA Comment Deadline on the AV Solar Ranch One Project Draft Environmental Impact Report

Dear Mr. Bruckner, Public Information Officer, and Mr. Szalay:

We write to request immediate access to public records responsive to our June 7, 2010 request, which the Los Angeles County Department of Regional Planning ("DRP") failed to make available, as required by the Public Records Act. In addition, we request an extension of the public comment deadline for the AV

ORG-2-1

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Solar Ranch One Project Draft Environmental Impact Report ("DEIR") due to DRP's failure to make all documents referenced in the DEIR available for the duration of the public comment period, as required by the California Environmental Quality Act ("CEQA").

The Public Records Act was enacted "for the explicit purpose of increasing freedom of information by giving the public access to information *in possession of public agencies*.[1] "Public records" are broadly defined by the Act to include "any writing containing information relating to the conduct of the public's business prepared, owned, used, or retained by any state or local agency regardless of physical form or characteristics."[2]

On June 7, 2010, we requested a copy of all public records pertaining to the AV Solar Ranch One Project ("Project") that have been received or created by DRP since the date of our prior request. (See Attachment A - PRA Request.) You responded that both the draft environmental impact report and the technical appendices will be posted on the Department's case and hearing website, and that prior to the June 30, 2010 public hearing date, the remaining hearing materials will also be posted. (See Attachment B - Email.) On June 15, 2010, we wrote to clarify that our June 7, 2010 Public Records Act request was for a copy of all public records pertaining to the Project that have been received or created by DRP since July 2009. (See Attachment C - PRA Request.) On June 16, 2010, you indicated that all DEIR Project files would be made available for duplication. (Attachment D - Emails.) On June 17, 2010, we received mailed Notice of Completion and Availability of Draft Environmental Impact Report for the AV Solar Ranch One Project. (Attachment E - Notice.)

The Project documents were produced for duplication on June 23, 2010. (*See* Attachment F - Email.) However, the documents that were made available did <u>not</u> include all public records in the possession of DRP regarding the Project. Namely,

ORG-2-1

[1] *CBS, Inc. v. Block* (1986) 42 Cal.3d 646, 651 (emphasis added).
[2] *Los Angeles Unified School Dist. v. Superior Court* (2007) 151 Cal.App.4th 759, 765 *citing Times Mirror Co. v. Superior Court* (1991) 53 Ca.3d 1325,1338.

ORG-2

DRP failed to produce the following documents, which are explicitly referenced in the Project DEIR:[3]

1. Michael Brandman Associates (MBA), 2007. Phase I Environmental Site Assessment, Larsen Ranch, Los Angeles County, California. June 28;

2. Staal, Gardner & Dunne, Inc. (SGD), 1990. Preliminary Site Assessment California Springs, Los Angeles County, California. Prepared Impact Sciences, Inc. March;

3. URS. 2010. Pre-Demolition Survey Report Former Larsen Ranch Building, AV Solar Ranch One Project. February;

4. URS. 2008a. Phase I Site Assessment AV, Solar Ranch 1 Foroughi Property. December 10;

5. URS. 2008b. Phase I Site Assessment, Larsen Ranch Site. July 18;

6. Psomas. 2009. Design Concept Report. AV Solar Ranch One Project Antelope Valley, California. December;

7. Galloway, D.L., S.P. Phillips, and M.E. Ikehara, 1998. *Land Subsidence and its Relation to Past and Future Water Supplies in Antelope Valley, California*. In Current Research and Case Studies of Land Subsidence: Proceedings of the Dr. Joseph F. Poland Symposium. Association of Engineering Geologists Special Publication No. 8, Published by Star Publishing Company, Belmont, California 94002-0068;

8. Ogden, L.K.E. 1996. Collision course: the hazards of lighted structures and windows to migrating birds. Toronto, Canada: World Wildlife Fund Canada and Fatal Light Awareness Program. Rich and Longore (eds). 2006 Ecological Consequences of Artificial Night Lighting,

ORG-2-1

[3] Department of Regional Planning Impact Analysis Section, County of Los Angeles, Draft Environmental Impact Report AV Solar Ranch One Project, June 2010, pp. 5.15-23, 5.2-13, 5.3-21, 5.14-22.

(Island Press, 1718 Connecticut Avenue, N.W., Suite 200, Washington, D.C. 20009-1148. USA; 2006); and

9. Los Angeles County Department of Public Works (LACDPW). 2010. Letter from Dennis Hunter to Sorin Alexanian dated June 10, 2010 and attached Technical Memorandum (Water Requirements and Groundwater Supply AV Solar Ranch One) dated June 1, 2010 prepared by Joseph C. Scalmanini.

These documents were clearly in the possession of DRP as they were used to draft, and are referenced, in the DEIR. Consistent with the Public Records Act, these documents should have been produced along with the remaining Project files on June 23, 2010.

In addition to DRP's obligations under the Public Records Act, CEQA requires lead agencies to make all materials referenced in draft environmental impact reports readily available for public review for the duration of the public comment period.[4] The lead agency's notice to the public shall also specify the location where all such documents shall be made available for review, and this location shall be readily accessible to the public during the lead agency's normal working hours.[5] DRP failed to comply with CEQA's explicit mandate of public disclosure. DRP's June 17, 2010 notice fails to provide the location for review of documents referenced in the DEIR. Additionally, although the DEIR was open for public comment as of June 17, 2010, DRP did not make these documents available to CURE on June 23, 2010 – the day on which DRP provided CURE access to Project documents. DRP's failure to notify CURE of the location of the documents referenced in the Project DEIR, and its failure to produce these documents for duplication, cannot be squared with CEQA's requirement that all documents referenced in the DEIR shall be made readily available to the public for the duration of the public comment period. ORG-2-1

In sum, CURE's access to all public records regarding the Project has been considerably impeded due to DRP's inability to comply with the Public Records Act at a great expense to CURE. DRP's failure to make all documents referenced in the DEIR readily available to CURE also frustrates CURE's ability to review all

[4] Pub. Resources Code § 21092(b)(1); *see also* tit. 14, Cal. Code Regs. § 15087(c)(5).
[5] *Id.*

ORG-2

relevant information and to provide timely comments on the Project DEIR. As such, we request immediate access to the above referenced documents and a 45 day extension of the public comment period from the date you provide the requested materials to CURE.

Sincerely,

Elizabeth Klebaner

EK:cnh
Attachment (A-F)

cc: Christina Tran (Via email)
ctran@planning.lacounty.gov)

ORG-2-1

2292-018d

ATTACHMENT A

ORG-2

ADAMS BROADWELL JOSEPH & CARDOZO
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MARC D. JOSEPH
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TEL: (916) 444-6201
FAX: (916) 444-6209

June 7, 2010

VIA FACSIMILE AND U.S. MAIL

Bruce McClendon, Planning Director
LA County Department of Regional Planning
1390 Hall of Records
320 West Temple Street
Los Angeles, CA 90012
Fax: (213) 974-6384

Public Information Officer
Kenneth Hahn Hall of Administration
500 W. Temple Street, Room 358
Los Angeles, CA 90012
Fax: (213) 680-1122

Re: Public Records Act Request – AV Solar Ranch One Project

Dear Mr. McClendon and Public Information Officer:

We are writing on behalf of the California Unions for Reliable Energy to request a copy of all documents pertaining to the AV Solar Ranch One project ("Project") that have been received or created by the Los Angeles County Department of Regional Planning ("DPR") since our last request dated July 17, 2009.

This request is made pursuant to the California Public Records Act. (Government Code §§ 6250, et seq.) This request is also made pursuant to Article I, section 3(b) of the California Constitution, which provides a Constitutional right of access to information concerning the conduct of government. Article I, section 3(b) provides that any statutory right to information shall be broadly construed to provide the greatest access to government information and further requires that

ORG-2-1

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any statute that limits the right of access to information shall be narrowly construed.

We will pay any reasonable direct costs associated with this request up to $200. However, please call me at (650) 589-1660 with an estimate of the number of pages before copying/scanning the materials. Please mail or email the documents to:

Janet Laurain
Adams Broadwell Joseph & Cardozo
601 Gateway Boulevard, Suite 1000
South San Francisco, CA 94080
jlaurain@adamsbroadwell.com

Thank you for your assistance with this matter.

Sincerely,

Janet Laurain

Janet Laurain
Environmental Paralegal

JML:bh

2292-012a

ORG-2-1

ORG-2

ADAMS BROADWELL JOSEPH & CARDOZO

FAX TRANSMITTAL

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TO:	Bruce McClendon Public Information Officer	**FAX NO:**	213/974-6384 213/680-1122
FROM:	Janet M. Laurain	**DATE:**	June 7, 2010
ENCLOSURE:	Laurain letter (67/10) re Public Records Act Request – AV Solar Ranch One Project		

PAGES, including cover: 3

ORG-2-1

601 Gateway Boulevard, Suite 1000
South San Francisco, California 94080-7037
Telephone: (650) 589-1660
Facsimile: (650) 589-5062
E-mail: jlaurain@adamsbroadwell.com

ORG-2

MULTI COMMUNICATION REPORT

JUN-07-2010 10:22 AM MON

FAX NUMBER : 16505895062
NAME : ADAMS BROADWELL JOSE

REF. NAME :
PAGES : 3

1. SUCCESSFUL

FAX NUMBER	NAME
12139746384-2292	
12136801122-2292	

2. UNSUCCESSFUL

FAX NUMBER	NAME

3. MULTI COMMUNICATION JOURNAL

NO.	NAME/NUMBER	START TIME	TIME	MODE	PAGE	RESULT
6601	12139746384-2292	06-07 10:21AM	00'26"	ECM BC	003/003	[O.K]
6601	12136801122-2292	06-07 10:22AM	00'28"	ECM BC	003/003	[O.K]

ORG-2-1

ATTACHMENT B

ORG-2

Janet M. Laurain

From: Szalay, Kim [kszalay@planning.lacounty.gov]
Sent: Tuesday, June 08, 2010 2:36 PM
To: Janet M. Laurain
Cc: Keane, Patricia; Dea, Samuel
Subject: AVSR1 Public Information Request (Janet Laurain)

Good Afternoon Janet,

I received your recent public information request addressed to the Director of Planning and dated June 7, 2010. Please note that the new Director of Planning is Richard Bruckner. Per our phone conversation yesterday, I contacted Christina Tran of the Department's Impact Analysis Section regarding posting of the DEIR and technical appendices. Christina informed me that on the date circulation of the DEIR begins, projected to be later next week, both the DEIR and the technical appendices will be posted on the Department's case and hearing website per the link provided below. I will be glad to inform you of the exact starting date of the DEIR circulation as that date becomes certain. Various materials are currently posted on the below website. Once the circulation and comment period starting date is certain, the Notice of Availability and Completion of a Draft Environmental Impact Report, the DEIR and technical appendices will also be posted on the below website for your review. At least one week prior to the scheduled June 30, 2010 public hearing date, the remaining hearing materials, including the staff report and draft conditional use permit conditions, will also be posted on the below site. Once you have opportunity to view materials available on the website, please restate your request to the specific additional documents you would like copied.

http://planning.lacounty.gov/case/view/project_no._r2009-02239_tract_map_no._tr071035_av_solar_ranch_one_project

Sincerely,

Kim Szalay

Mr. Kim K. Szalay, MPL, AICP
Principal Regional Planning Assistant
Los Angeles County Department of Regional Planning
320 W. Temple St., L.A., CA 90012
Ph: (213) 974-4876 (Direct)
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kszalay@planning.lacounty.gov

PLEASE NOTE: This message, including any attachments, may include privileged, confidential and/or inside information. Any distribution or use of this communication by anyone other than the intended recipient(s) is strictly prohibited and may be unlawful. If you are not the intended recipient, please notify the sender by replying to this message and then delete it from your system. Thank you.

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ATTACHMENT C

ORG-2

ADAMS BROADWELL JOSEPH & CARDOZO
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SACRAMENTO, CA 95814-4721
TEL: (916) 444-6201
FAX: (916) 444-6209

June 15, 2010

VIA FACSIMILE AND U.S. MAIL

Richard Bruckner, Director of Planning
LA County Department of Regional Planning
1390 Hall of Records
320 West Temple Street
Los Angeles, CA 90012
Fax: (213) 974-6384

Public Information Officer
Kenneth Hahn Hall of Administration
500 W. Temple Street, Room 358
Los Angeles, CA 90012
Fax: (213) 680-1122

Kim K. Szalay, MPL, AICP
Principal Regional Planning Assistant
Los Angeles County Department of Regional Planning
320 W. Temple Street
Los Angeles, CA 90012
Fax: (213) 626-0434

Re: Public Records Act Request for the AV Solar Ranch One Project

Dear Mr. McClendon, Public Information Officer, and Mr. Szalay:

On June 7, 2010, we requested a copy of all public records pertaining to the AV Solar Ranch One project ("Project") that have been received or created by the Los Angeles County Department of Regional Planning ("DRP") since the date of our last request on July 17, 2009. You responded that both the draft environmental impact report and the technical appendices will be posted on the Department's case and hearing website, and that prior to the June 30, 2010 public hearing date, the remaining hearing materials will also be posted. (See Attachment A - Email.)

2292-013a

ORG-2-1

We are writing to inform you that our June 7, 2010 Public Records Act request was for a copy of ***all public records*** pertaining to the Project that have been received or created by DRP since July 17, 2009. Our June 7, 2010 request was not a request for a copy of the DEIR and appendices that the County anticipates posting on the internet later this month. Instead, our request is for all public records in the file the Project.

We appreciate your notifying us of the location where materials will be posted pursuant to our March 27, 2009 request for ***notice*** of the availability of any environmental review document, prepared pursuant to the California Environmental Quality Act, as well as a copy of the environmental review document when it is made available for public review. However, our request for notice is not the same as our request for public records under the California Public Records Act.

If the County provides a service for copying, we will pay any reasonable direct costs associated with this request up to $200. However, please call me at (650) 589-1660 with a cost estimate before copying/scanning. The documents responsive to this request can be mailed or emailed to:

Janet Laurain
Adams Broadwell Joseph & Cardozo
601 Gateway Boulevard, Suite 1000
South San Francisco, CA 94080
jlaurain@adamsbroadwell.com

In the alternative, please let me know when the public records will be available for us to have a copy service scan them.

Thank you for your assistance with this matter.

Sincerely,

Janet Laurain

Janet Laurain
Environmental Paralegal

JML:bh

VIA Email:
cc: Christina Tran, ctran@planning.lacounty.gov
2292-013a

ORG-2-1

ORG-2

ADAMS BROADWELL JOSEPH & CARDOZO

FAX TRANSMITTAL

NOTICE – PRIVILEGED AND CONFIDENTIAL INFORMATION
This message is for addressee only. Review, distribution or copy by others is strictly prohibited. Notify us immediately by telephone if you received this message in error and return the original.

TO:	Richard Bruckner	**FAX NO:**	213-974-6384
	Public Information Officer		213-680-1122
	Kim K. Szalay		213-626-0434
FROM:	Janet Laurain	**DATE:**	June 15, 2010
ENCLOSURE:	Laurain Letter (6/15/10) re Public Records Act Request for the AV Solar Ranch One project		

PAGES, including cover: ~~3~~ 4

601 Gateway Boulevard, Suite 1000
South San Francisco, California 94080-7037
Telephone: (650) 589-1660
Facsimile: (650) 589-5062
E-mail: jlaurain@adamsbroadwell.com

ORG-2-1

ATTACHMENT A

ORG-2

Janet M. Laurain

From: Szalay, Kim [kszalay@planning.lacounty.gov]
Sent: Tuesday, June 08, 2010 2:36 PM
To: Janet M. Laurain
Cc: Keane, Patricia; Dea, Samuel
Subject: AVSR1 Public Information Request (Janet Laurain)

Good Afternoon Janet,

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http://planning.lacounty.gov/case/view/project_no._r2009-02239_tract_map_no._tr071035_av_solar_ranch_one_project

Sincerely,

Kim Szalay

Mr. Kim K. Szalay, MPL, AICP
Principal Regional Planning Assistant
Los Angeles County Department of Regional Planning
320 W. Temple St., L.A., CA 90012
Ph: (213) 974-4876 (Direct)
Fax: (213) 626-0434
kszalay@planning.lacounty.gov

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MESSAGE CONFIRMATION

JUN-15-2010 11:20 AM TUE

FAX NUMBER : 16505895062
NAME : ADAMS BROADWELL JOSE

NAME/NUMBER : 12136260434-2292
PAGE : 4
START TIME : JUN-15-2010 11:18AM TUE
ELAPSED TIME : 01'42"
MODE : STD G3
RESULTS : [O.K]

ADAMS BROADWELL JOSEPH & CARDOZO

FAX TRANSMITTAL

NOTICE - PRIVILEGED AND CONFIDENTIAL INFORMATION
This message is for addressee only. Review, distribution or copy by others is strictly prohibited. Notify us immediately by telephone if you received this message in error and return the original.

TO:	Richard Bruckner	FAX NO:	213-974-6384
	Public Information Officer		213-680-1122
	Kim K. Szalay		213-626-0434
FROM:	Janet Laurain	DATE:	June 15, 2010

ENCLOSURE: Laurain Letter (6/15/10) re Public Records Act Request for the AV Solar Ranch One project

PAGES, including cover: ~~3~~ 4

601 Gateway Boulevard, Suite 1000
South San Francisco, California 94080-7037
Telephone: (650) 589-1660
Facsimile: (650) 589-5062
E-mail: jlaurain@adamsbroadwell.com

ORG-2-1

ORG-2

MULTI COMMUNICATION REPORT

JUN-15-2010 11:18 AM TUE

FAX NUMBER : 16505895062
NAME : ADAMS BROADWELL JOSE

REF. NAME :
PAGES : 4

1. SUCCESSFUL

FAX NUMBER	NAME
12139746384-2292	
12136801122-2292	

2. UNSUCCESSFUL

FAX NUMBER	NAME

3. MULTI COMMUNICATION JOURNAL

NO.	NAME/NUMBER	START TIME	TIME	MODE	PAGE	RESULTS
6606	12139746384-2292	06-15 11:16AM	00'42"	ECM BC	004/004	[O.K]
6606	12136801122-2292	06-15 11:17AM	00'42"	ECM BC	004/004	[O.K]

ORG-2-1

ATTACHMENT D

ORG-2

Janet M. Laurain

From: Szalay, Kim [kszalay@planning.lacounty.gov]
Sent: Wednesday, June 16, 2010 9:51 AM
To: Janet M. Laurain
Cc: Tran, Christina; Dea, Samuel
Subject: AVSR1 Public Records Request Clarifications

Good Morning Janet,

For further clarification regarding below e-mail, please note that it is the requestor's responsibility to arrange with a bonded copy service provider what is requested to be copied, where copies are to be delivered, how payment will be made, and making payment directly with the bonded copy service provider. The service provider I referenced previously is located downtown nearby.

The bonded copy service provider will then arrange a time with me to pick up the requested materials for copying and service provider's delivery to you. The files will be available for copying next week, Wednesday or following. Per your e-mail regarding file sizes, the CUP file is approximately four inches thick including folded full-sized exhibits for Exhibit "A", the VTTM file is about one inch thick including maps, and the DEIR file excluding DEIR and appendices, which are available online, is approximately three inches thick.

Kim Szalay

From: Szalay, Kim
Sent: Tuesday, June 15, 2010 6:06 PM
To: 'jlaurain@adamsbroadwell.com'
Cc: Tran, Christina; Dea, Samuel
Subject: AVSR1 Public Records Request

Dear Janet,

Below is the contact information for Concord Bonded Copy service. You may wish to contact Sergio Solis or another representative at (213) 215-0957 for local bonded copy service for the copies of records requested. You will need to give them instructions per your cost parameters, etc., for what you want copied. I will have the Permit files available for their retrieval, copying, and delivery to you.

Yours,

Kim Szalay

Mr. Kim K. Szalay, MPL, AICP
Principal Regional Planning Assistant
Los Angeles County Department of Regional Planning
320 W. Temple St., L.A., CA 90012
Ph: (213) 974-4876 (Direct)
Fax: (213) 626-0434
kszalay@planning.lacounty.gov

ORG-2-1

ORG-2

Janet M. Laurain

From: Tran, Christina [ctran@planning.lacounty.gov]
Sent: Wednesday, June 16, 2010 10:29 AM
To: Janet M. Laurain
Cc: Szalay, Kim
Subject: RE: AVSR1 Public Records Request Clarifications

Dear Janet,

It includes maps, the Initial Study Questionnaire, the Initial Study, all comment letters received, any letters sent by the County relating to environmental review, etc..

Thank you.

From: Janet M. Laurain [mailto:jlaurain@adamsbroadwell.com]
Sent: Wednesday, June 16, 2010 10:03 AM
To: Tran, Christina
Subject: FW: AVSR1 Public Records Request Clarifications

Dear Christina,

Do you know what is in the file that Mr. Szalay is referring to in his email below?

"DEIR file excluding DEIR and appendices, which are available online, is approximately three inches thick."

Thank you.

Janet Laurain

From: Szalay, Kim [mailto:kszalay@planning.lacounty.gov]
Sent: Wednesday, June 16, 2010 9:51 AM
To: Janet M. Laurain
Cc: Tran, Christina; Dea, Samuel
Subject: AVSR1 Public Records Request Clarifications

Good Morning Janet,

For further clarification regarding below e-mail, please note that it is the requestor's responsibility to arrange with a bonded copy service provider what is requested to be copied, where copies are to be delivered, how payment will be made, and making payment directly with the bonded copy service provider. The service provider I referenced previously is located downtown nearby.

The bonded copy service provider will then arrange a time with me to pick up the requested materials for copying and service provider's delivery to you. The files will be available for copying next week, Wednesday or following. Per your e-mail regarding file sizes, the CUP file is approximately four inches thick including folded full-sized exhibits for Exhibit "A", the VTTM file is about one inch thick including maps, and the DEIR file excluding DEIR and appendices, which are available online, is approximately three inches thick.

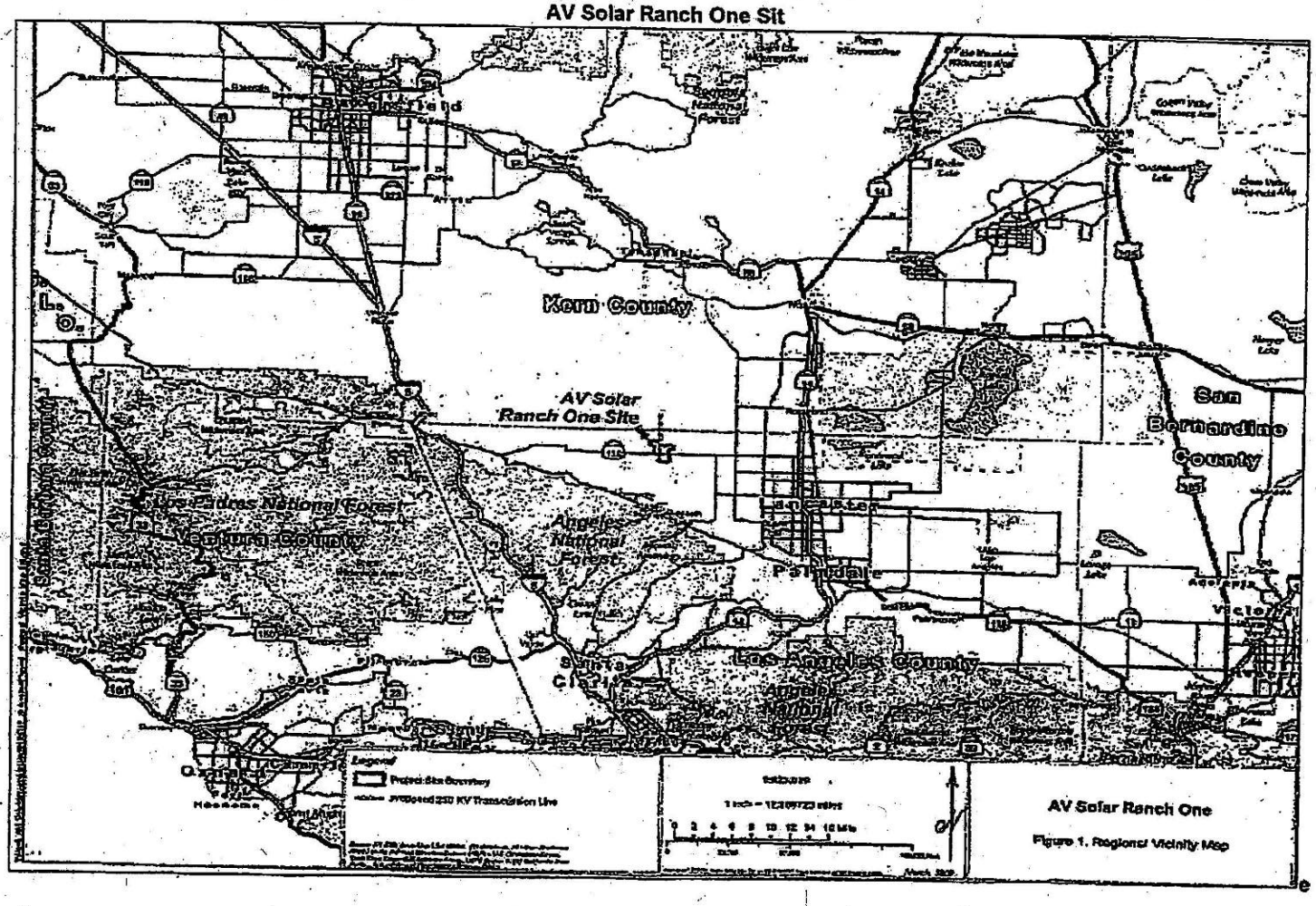
Kim Szalay

ORG-2-1

ATTACHMENT E

VICINITY MAP BELOW

AV Solar Ranch One Sit



ATTACHMENT F

ORG-2

Janet M. Laurain

From: Janet M. Laurain
Sent: Friday, June 18, 2010 3:52 PM
To: 'sergio'
Subject: RE: Scan job at Los Angeles County Department of Regional Planning

Thanks Sergio,

Kim is a "he" and he said that he should be able to make the documents available by Wednesday. I'll give him a call on Tuesday to make sure as to the day they will actually be there for you.

Janet

From: sergio [mailto:sergio@copying.la]
Sent: Thursday, June 17, 2010 5:20 PM
To: Janet M. Laurain
Subject: RE: Scan job at Los Angeles County Department of Regional Planning

Hi Janet,

Absolutely, we can go to Los Angeles County Department of Regional Planning. This is considered an off-site job.

Here the charges are:

- $150.00 dollars to pick up & return the file back to LA Regional Planning.
- .14 cents per B/W ltr size page(copy or scan).
- $25.00 dollars for CD Export(pdf)- all the scanned images.
- The shipping is free if you provide your Fed Ex account.

Please let me know the name or number of the file of which Kim Szalay has with her. Then I could call her on Monday to schedule a pick up from her.

Best Regards,

Sergio Solis.

CONCORD
Document Services, Inc.

Sergio Solis
(213) 215-0957
sergio@copying.la
350 S. Grand Ave., Suite A-5
Los Angeles, CA 90071

ORG-2-1

ORG-2

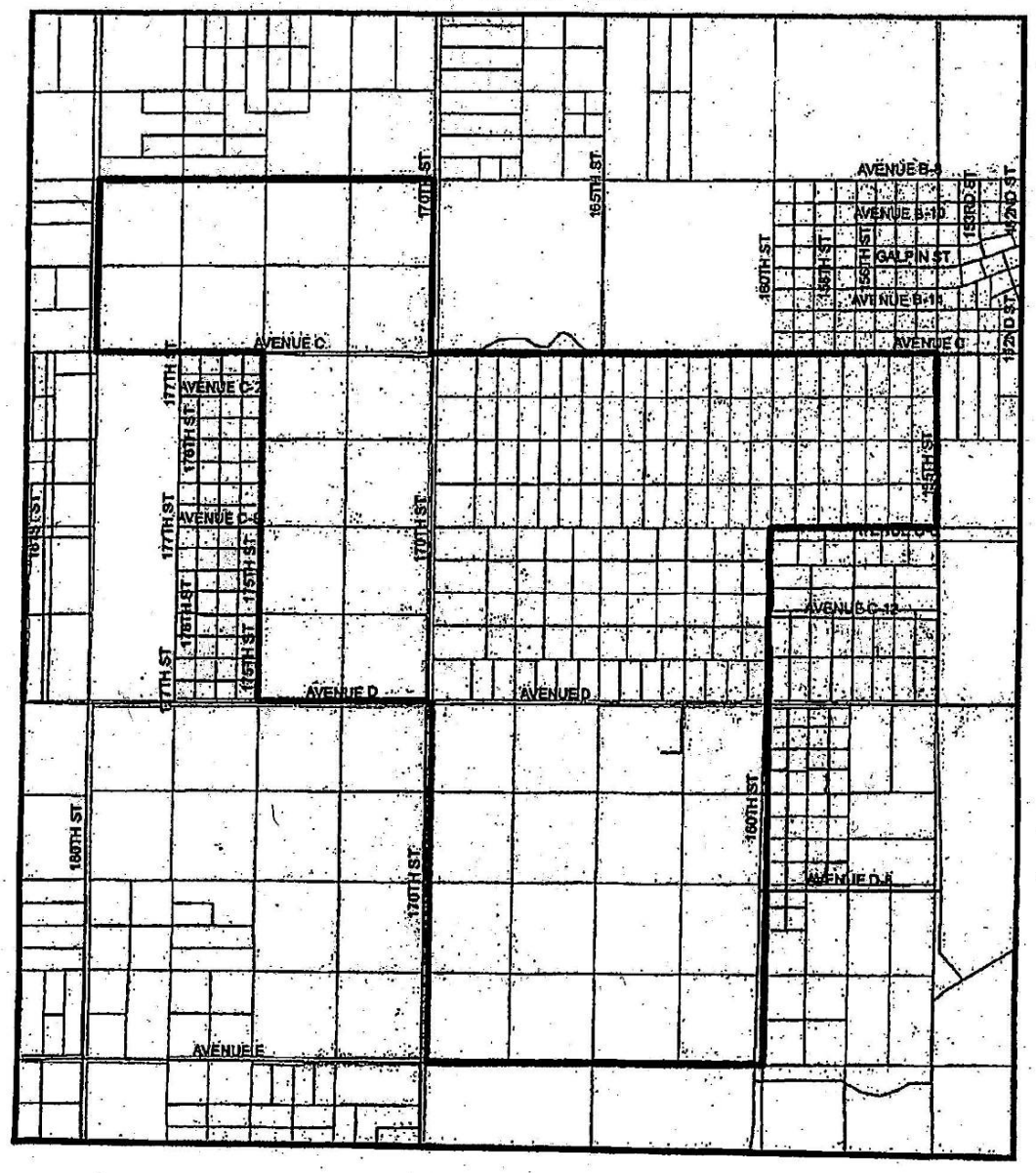
Copies of the DEIR and documents referenced in the DEIR will also be available for public review Monday through Thursday, 7:30 a.m. to 5:30 p.m. at:

Los Angeles County
Department of Regional Planning
Impact Analysis Section, Room 1348
320 West Temple Street
Los Angeles, CA 90012
(213) 974-6461

Please submit written comments on the DEIR to **Christina Tran** of the Department of Regional Planning at the address above, or via email at ctran@planning.lacounty.gov

VICINITY MAP BELOW

AV Solar Ranch One Site



ORG-2-1

Written Responses to Adams Broadwell Joseph & Cardozo (Letter Dated July 30, 2010) (ORG-3)

Written Responses to Adams Broadwell Joseph & Cardozo Letter dated July 30, 2010 (ORG-3) follow. This comment letter consists of a 39-page letter and attachments A through J. The letter is designated ORG-3 and the attachments are designated ORG-3A through ORG-3J. Responses are provided for the letter and attachments A (ORG-3A) and B (ORG-3B). Attachments C through J are reference documents attached to the comment letter and, as such, do not warrant responses.

Response ORG-3-1:

This comment provides an introduction to the letter that follows, but does not state a specific concern or question regarding the adequacy of the analysis contained in the Draft EIR. Therefore, a response is not required pursuant to CEQA. However, the comment is acknowledged for the record and will be forwarded to the decision-making bodies for their review and consideration.

Response ORG-3-2:

The County disagrees with this comment and the general contention that the Draft EIR is inadequate (relative to air quality, biological resources, and soil and water) and requires recirculation. The Draft EIR provides thorough discussions and analysis for all applicable resource topics, including characterization of baseline environmental conditions, identification of all potentially significant impacts, and specification of appropriate mitigation measures for reducing identified impacts to less than significant levels. Please refer to subsequent responses to comments with more specificity, including:

- Air Quality (see Responses ORG-3-8, -14, -16, -19, -25, -27, -31, -32, -33,-55, -58, and -59)
- Biological Resources (see Responses ORG-3-12, -16, -29, -31, -34 through -39, -61, -63, and -76; and ORG-3B-3 through -10, -13, -17, -18, -19, -22 and -25)
- Soil (see Responses ORG-3-14, -19, -26, -49, and -59)
- Water (see Responses ORG-3-9, -13, -15, -18, -40 through -48, -65, -66, -67, -69, -70, -71, and -78; and ORG-3A-6 and -10).

As discussed in subsequent Responses, the Draft EIR includes sufficient information and analysis regarding the Project's potentially significant impacts to air quality, biological resources, water supply and groundwater resources, and soil contamination et al. Moreover,

there is no significant new information requiring recirculation (See CEQA Guidelines Section 15088.5).

Response ORG-3-3:

The comment in general, correctly identifies various permits that would be required, but does not state a specific concern or question regarding the adequacy of the analysis contained in the Draft EIR. Therefore, a response is not required pursuant to CEQA. However, the comment is acknowledged for the record and will be forwarded to the decision-making bodies for their review and consideration.

Response ORG-3-4:

The proposed Project will not require a Stream Alteration Agreement from the California Department of Fish and Game. See Response ORG-3-29.

Response ORG-3-5:

This comment identifies that the comment letter is provided by the attorney firm representing CURE, which is a coalition of unions whose members build, maintain, and operate power plants. The comment states that poorly designed renewable energy power plants may degrade the environment, and that the union members live in and around this community may have a direct interest in protecting the biological resources in and around the Project site, and the groundwater and air resources in the Antelope Valley. Further, the union members have a direct interest in ensuring a safe workplace for workers during Project construction. This comment does not state a specific concern or question regarding the adequacy of the analysis contained in the Draft EIR. Therefore, a response is not required pursuant to CEQA. However, the comment is acknowledged for the record and will be forwarded to the decision-making bodies for their review and consideration.

Response ORG-3-6:

The Final EIR responds to all comments received within the formal comment period for the Draft EIR, including the attachments to CURE's letter. Please refer to Responses ORG-3A (-1 through -15) and ORG-3B (-1 through -25), respectively, for the responses to the comments provided in Attachment A (comments of Matthew Hagemenn, P.G.) and Attachment B (comments of Jim Cornett, M.S.).

Response ORG-3-7:

The County disagrees with this general comment and the contention that the Draft EIR is inadequate in these areas. See Response ORG-3-2.

Response ORG-3-8:

The County disagrees with the contention that the Project Description as presented in Draft EIR Section 4.0 is not stable and finite. The Project Description presents options for certain aspects of solar field development such as panel types and foundations and the Draft EIR assessments utilize the worst-case earth movement, air emissions, traffic and noise levels, etc. associated with the options presented to ensure that the environmental analyses presented in the Draft EIR are conservative and cover the worst-case development scenario for each discipline. Please refer to Responses ORG-3-19 through ORG-3-28 for more information.

Response ORG-3-9:

California Water Code section 10910 provides that any county that determines a project, as defined in Water Code section 10912, is subject to CEQA shall prepare a Water Supply Assessment (WSA). Water Code section 10912(a) defines "project" as any of the following:

(1) A proposed residential development of more than 500 dwelling units.

(2) A proposed shopping center or business establishment employing more than 1,000 persons or having more than 500,000 square feet of floor space.

(3) A proposed commercial office building employing more than 1,000 persons or having more than 250,000 square feet of floor space.

(4) A proposed hotel or motel, or both, having more than 500 rooms.

(5) A proposed industrial, manufacturing, or processing plant, or industrial park planned to house more than 1,000 persons, occupying more than 40 acres of land, or having more than 650,000 square feet of floor area.

(6) A mixed-use project that includes one or more of the projects specified in this subdivision.

(7) A project that would demand an amount of water equivalent to, or greater than, the amount of water required by a 500 dwelling unit project.

The Project is not a "project" as defined in Water Code section 10912. The Project is not a residential development as defined in Water Code section 10912(a)(1); a shopping center or business establishment as defined in Water Code section 10912(a)(2); a commercial office building as defined in Water Code section 10912(a)(3); a hotel or motel as defined in Water Code section 10912(a)(4); or a mixed-use project as defined in Water Code section 10912(a)(6).

In addition, the Project is not an industrial, manufacturing, or processing plant as defined in Water Code section 10912(a)(5); the Project is a renewable solar photovoltaic project. The

Project is not a project as defined in Water Code section 10912(a)7) because it requires substantially less than an amount of water equivalent to, or greater than, the amount of water required by a 500 dwelling unit project. (*See* Water Code § 10912(a)(7).) The Project is estimated to require approximately 150 AFY during the 38 month construction period and 12 AFY during operation. The Antelope Valley Integrated Regional Water Management Plan estimates a single family dwelling unit to use between 0.86 and 1.2 AFY (RWMG 2007); a 500 dwelling unit project based on this estimate demands between 430 to 600 AFY. Because the Project is not a "project", a WSA is not required for the Project. Accordingly a WSA was neither prepared nor included in the Draft EIR.

Nevertheless, the Draft EIR presents a detailed analysis of groundwater resources and potential Project effects in Section 5.14 (Utility Services), Appendix J (Groundwater Characteristics at the AV Solar Ranch One Site), and Appendix J2 (Water Requirements and Groundwater Supply at the AV Solar Ranch One Site). In accordance with CEQA's mandates, the analysis sets forth the amount of groundwater available in the Antelope Valley Groundwater Basin and includes a level of current water consumption. (See *Cadiz Land Co. v. Rail Cycle*, 83 Cal.App.4th 74 (2000) and *Save Our Peninsula Committee v. Monterey Bay County Board of Supervisors*, 87 Cal.App.4th 99 (2001).)

Response ORG-3-10:

The County disagrees with this comment and the contention that the Draft EIR is inadequate and requires recirculation. See Responses ORG-3-2 and ORG-3-79. In accordance with CEQA (Public Resources Code, Section 15088.5), the Draft EIR does not require the addition of significant new information, and thus, does not require recirculation.

Response ORG-3-11:

This comment presents two basic purposes of CEQA, but does not state a specific concern or question regarding the adequacy of the analysis contained in the Draft EIR. Therefore, a response is not required pursuant to CEQA. However, the comment is acknowledged for the record and will be forwarded to the decision-making bodies for their review and consideration.

Response ORG-3-12:

The Draft EIR presents a detailed and comprehensive Project Description in Section 4.0 (Project Description). Please refer to Responses ORG-3-8 and ORG-3-19 through ORG-3-28 for more information.

The comment also asserts that the Draft EIR failed to set forth a sufficiently detailed biological baseline, and failed to examine impacts to the desert tortoise, Mohave ground

squirrel, and "numerous other special status plants and wildlife." A robust and detailed description of the baseline conditions with respect to biological resources was presented in Section 5.7 of the Draft EIR and in the Biota Report, included as Appendix E to the Draft EIR. These documents included a detailed biological description of the site and its surroundings, descriptions of the various field surveys conducted, and discussions of the resources present, including plants, animals, and mapped vegetation communities. Refer to Responses ORG-3-34 through ORG-3-39 for more information. All special-status resources identified during field investigations of the site were considered in the impacts analysis. For additional responses addressing the desert tortoise and Mohave ground squirrel, please refer to Responses ORG-3B-7 and ORG-3B-6, respectively.

Response ORG-3-13:

The Draft EIR provides an accurate description of the existing environment for water supply in Draft EIR Section 5.14.2.1. With respect to groundwater resources, the Draft EIR presents a detailed analysis of groundwater resources and potential Project effects in Section 5.14 (Utility Services); Appendix J (Groundwater Characteristics at the AV Solar Ranch One Site), which includes the results of an on-site well investigation performed for the Project; and Appendix J2 (Water Requirements and Groundwater Supply at the AV Solar Ranch One Site). Refer to Responses ORG-3-40 through ORG-3-48, ORG-3-65, ORG-3-67, ORG-3-69 through ORG-3-71, and ORG-3-78 for more information.

Response ORG-3-14:

The Draft EIR presents a thorough assessment of the air quality baseline and impacts in Section 5.6 (Air Quality) and Appendix D (Air Quality Emission Calculations and Wind Rose Data). Additionally, the Draft EIR presents an assessment of Valley Fever in Air Quality Environmental Setting Sections 5.6.2.3.3 and 5.6.2.5; Project Impacts Sections 5.6.3.4.4 and 5.6.6; and Mitigation Measure Section 5.6.5 (Mitigation Measure 5.6-11: Off-road Equipment Operator Worker Protection). As discussed in Draft EIR Section 5.6.6, with implementation of required mitigation measures to reduce fugitive dust emissions and worker protection, the risk associated with dust exposure and possible Valley Fever exposure would be substantially reduced and would be considered less than significant. Refer to Response ORG-3-33 for more information regarding the Draft EIR assessment of Valley Fever.

Draft EIR Section 5.15 (Environmental Safety) summarizes the results of the previous Phase I Environmental Site Assessments conducted on the Project site, assesses impacts associated with potential soil contamination and hazardous building materials on the site, and requires mitigation to reduce all identified potential impacts to less than significant.

Response ORG-3-15:

As discussed in Response ORG-3-9, a WSA is not required for the Project and, accordingly, a WSA was neither prepared nor included in the Draft EIR. The Draft EIR presents a detailed analysis of groundwater resources and potential Project effects in Section 5.14, Appendix J, and Appendix J2.

Response ORG-3-16:

The Draft EIR identifies feasible mitigation measures for all potentially significant impacts to biological resources in Section 5.7.5 and all identified impacts. The analysis concludes that all impacts would be mitigated to less than significant levels. As stated in Responses ORG-3-4 and ORG-3-29, the proposed Project would not impact any state jurisdictional waters. As discussed in Responses ORG-3-14 and ORG-3-33, required dust control and worker protection mitigation measures specified in Draft EIR Section 5.6.5 (Air Quality) would mitigate potentially significant Valley Fever impacts to less than significant levels.

Response ORG-3-17:

The County disagrees with this comment and the contention that the Draft EIR is inadequate in these areas. The adequacy of the Draft EIR Project Description is addressed in Responses ORG-3-8 and ORG-3-19 through ORG-3-28. A WSA is not required for the Project as discussed in Response ORG-3-9 and ORG-3-15.

Response ORG-3-18:

As discussed in Responses ORG-3-46 and ORG-3-65, the Draft EIR provides an assessment of existing groundwater conditions in the Project area and potential Project impacts to groundwater resources and concludes that such impacts would be less than significant.

Response ORG-3-19:

Please refer to Response ORG-3-8. Draft EIR Section 4.0 (Project Description) clearly identifies the Project purpose and objectives, project location and boundaries, and project characteristics in accordance with (CEQA Guidelines Section 15124). As clearly stated in Draft EIR Sections 4.4 (Project Characteristics) and 4.4.1 (Facility Equipment), the proposed Project consists of a 230 MW solar PV facility on 2,100 acres of land and the major Project equipment consists of PV solar panels mounted on single-axis trackers (tilted or horizontal) or fixed tilt supports. The Applicant's proposed Project includes these options for solar PV facility equipment to allow flexibility in equipment selection based on market conditions, ongoing advances in solar PV technology, and equipment availability at the time of construction. The Draft EIR Project Description presents the key differences in the design

and physical characteristics of each option and the environmental analyses presented in Draft EIR Section 5.0 (Environmental Impact Analysis), including air quality, soil and water, consider the worst-case attributes of the Project options respective to each environmental analysis.

Response ORG-3-20:

The comment asserts that the project description presented in the Draft EIR fails to include the Project's need for a Streambed Alteration Agreement. As stated in Draft EIR Section 5.7, the proposed Project would avoid all jurisdictional streambeds, and thus would not require a Streambed Alteration Agreement. See Response ORG-3-29.

Response ORG-3-21:

As discussed in Draft EIR Section 4.4.6.7.6 (On-site/Off-site 230 kV Transmission Line) and shown on Figures 4.3-4A and B, the proposed transmission line does not include an access road along the right of way. The portion in Los Angeles County is within the edge of the public road right of way of 170th Street West and short access pathways from the roadway to the individual pole locations are shown on Figure 4.3-4A. Similarly, perpendicular access pathways from 170th Street West to individual pole locations are shown on Figures 4.3-4A and B for the portion of the transmission line route in Kern County.

As discussed in Draft EIR Section 4.4.2.4, the Project's domestic water needs during operation would be supplied via a new well to be developed in conformance with Los Angeles County Department of Public Health standards and a 100,000 gallon process water/fire water tank (and associated piping) to be constructed adjacent to the O&M building.

Response ORG-3-22:

Please refer to Responses ORG-3-8 and ORG-3-19. The proposed Project includes use of PV panels mounted on single axis trackers (tilted and/or horizontal) and/or fixed tilt supports. The environmental analyses presented in the Draft EIR consider these options to the extent they would result in differing impacts. The Project Description presented in Draft EIR Section 4.0 includes pertinent design details for each option and the environmental analyses consider the worst case attributes as applicable to each environmental resource topic.

Response ORG-3-23:

The County disagrees with this comment that the Project Description compromises the adequacy of the Draft EIR or that portions of the Draft EIR are incomprehensible. Please refer to Responses ORG-3-8, ORG 3-19 and ORG 3-22.

Response ORG-3-24:

Please refer to Responses ORG-3-8 and ORG-3-22. The Noise impact assessment presented in Draft EIR Section 5.18 and the Noise Technical Report presented in Appendix I of the Draft EIR consider worst-case construction noise impacts due to vibratory pile drivers and other construction noise sources as well as operational noise levels and impacts from tracker motors, inverters and transformers among other sources. The noise assessment presented in the Draft EIR is comprehensive and assumes worst case noise impact scenarios. As discussed in Draft EIR Noise Section 5.18.3.2.3, two basic construction scenarios for the solar arrays are considered: 1) pile foundations; and 2) concrete ballast foundations. The pile drivers required for driven pile foundations constitute the worst-case construction scenario for noise generation. Noise levels associated with Project construction are presented in Noise Section 5.18.3.2.3 and Appendix I (Noise Technical Report) of the Draft EIR, including identification of the following major construction components: Project substation; O&M facilities; Drainage A cutoff wall; solar field areas; and on-site/off-site 230 kV transmission line. Maximum noise levels from construction equipment are identified by construction component and assessed for significance against applicable noise standards. All of the major construction components with the exception of solar panel foundation type (i.e., pile or concrete ballast) are common to all facility design options considered. As discussed in Draft EIR Section 5.18.3.2.3 (under "solar field"), the driven pile foundation option would involve the installation of approximately 465,000 steel piles throughout the solar field using pile drivers (hydraulic vibratory pile drivers) with associated noise levels of 88 dBA at 50 feet from the front of the equipment to 81 dBA at a distance of 50 feet from the rear of the equipment. The proposed Project includes a concrete batch plant near the O&M building (interior of Project site; noise level of 83 dBA Lmax at 50 feet assumed in Draft EIR noise assessment) to meet construction concrete needs. The concrete batch plant may be utilized regardless of solar panel foundation type selected (i.e., pile or concrete ballast).Use of concrete ballast foundations (pre-cast prior to placement in solar field) for solar panel array supports would not involve use of pile drivers or any other construction equipment/activities with noise levels outside the range of other typical construction equipment considered in the Draft EIR noise impact assessment for the Project. Therefore, as discussed in Section 5.18.3.2.3 of the Draft EIR, the pile foundation option using hydraulic vibratory pile drivers represents the worst-case construction noise impact scenario. The Draft EIR noise impact assessment assumes pile foundations and use of pile drivers in order to analyze the worst-case construction noise impacts from the Project as required by CEQA. The comprehensive noise assessment conducted for the Project is documented in Section 5.18 and Appendix I of the Draft EIR, including the applicable noise standards, identification of potential sensitive noise receptors (i.e., residences), baseline noise measurement results, impact assessment methodology and results for construction and operation phases, and mitigation requirements. With implementation of the noise mitigation specified in Section 5.18.5 of the Draft EIR, all construction and operational phase noise impacts are determined to be less than significant.

Response ORG-3-25:

The methodology for quantification of air emissions is presented in Draft EIR Section 5.6.3.2. As stated and discussed in Draft EIR Section 5.6.3.2, there are two primary scenarios for quantification of construction emissions – pile driven and concrete ballast foundations. Project construction emissions were calculated for both foundation scenarios and the results are presented separately for both scenarios in Draft EIR Section 5.6 (Air Quality), Tables 5.6-13 (pile scenario) and 5.6-14 (concrete ballast foundation scenario), and documented in Draft EIR Appendix D (Air Quality Emission Calculations and Wind Rose Data). As the Draft EIR clearly shows, the pile foundation scenario would result in greater emissions than the concrete ballast foundation scenario, but calculated emissions of criteria pollutants under both construction scenarios would be below applicable AVAQMD emission thresholds and would be less than significant. The emissions associated with a concrete batch plant are included and analyzed (Draft EIR Section 5.6 and Appendix D) in the event that the Project's need for concrete warrant an on-site concrete batch plant. The calculated construction emissions, with consideration of an on-site concrete batch plant (electric powered), are less than AVAQMD thresholds and, thus, less than significant. No further analysis is warranted.

Response ORG-3-26:

Project grading and excavation requirements are discussed in Draft EIR Section 4.4.6.4 (Site Clearing and Grading) and itemized in Table 4.4-2 (Estimated Grading/Cut and Fill and Non-grading Related Excavated Material Balance). The total Project grading-related balanced cut and fill (balanced on-site) is estimated to be 180,000 cubic yards, with an estimated additional 69,000 cubic yards of soil from on-site and off-site excavations (non-grading related) for a total of approximately 250,000 cubic yards of soil material movement during Project development. As stated in Section 4.4.6.4 of the Draft EIR, the total quantity of balanced cut and fill and non-grading related excavations on the site will depend on the final Project design and associated options selected, including foundation type(s). Figure 4.4-12 (Grading and Drainage Plan) of the Draft EIR (which is referenced by the commenter) lists estimated on-site grading related cut and fill as 179,996 cubic yards of cut and 179,710 cubic yards of fill. The difference between 179,996 and 179,710 is 286 cubic yards not 2,000 cubic yards as stated in this comment. The small variance between these estimates of grading related cut and fill does not affect the validity of the statements in the Draft EIR that approximately 180,000 cubic yards of grading related cut and fill would be balanced on-site. Table 4.4-1 (Estimated Grading/Cut and Fill and Non-grading Related Excavated Material Balance) of the Draft EIR (which is referenced by the commenter) lists both grading and non-grading related cut and fill whereas Draft EIR Figure 4.4-12 (Grading and Drainage Plan) only lists grading-related cut and fill which is consistent with standard engineering practice and requirements for grading and drainage plans. The grading related cut and fill estimates presented in Table 4.4-1 and Figure 4.4-12 of the Draft EIR are consistent (i.e.,

estimated 179,996 and 179,910 cubic yards of grading related cut and fill, respectively). Table 4.4-1 of the Draft EIR also lists estimates of non-grading related excavations (approximately 67,000 cubic yards on-site and 2,000 cubic yards off-site), which total approximately 69,000 cubic yards. Further, Table 4.4-1 of the Draft EIR lists the total grading related cut and fill and non-grading related excavations for the Project at 249,933 and 248,356 cubic yards of total cut and fill, respectively, with an estimated excess of 977 cubic yards of cut. The small variance (less than 0.04%) between the total estimated cut and fill (i.e., 977 cubic yards of excess) is considered "balanced" from a preliminary engineering perspective and does not affect the validity of the statements in the Draft EIR that approximately 250,000 cubic yards of grading related cut and fill and non-grading related excavations would be balanced on-site. The Draft EIR does not specify grading and excavation quantities of up to 700,000 cubic yards. The April 29, 2009 NOP for the Project presented in Draft EIR Appendix A stated that 700,000 cubic yards of grading was proposed and that the majority of the 700,000 cubic yards was for drainage channel improvements (Drainage A). The Applicant voluntarily removed the channel improvements from the Project prior to issuance of the Draft EIR. The total grading and non-grading related cut and fill estimate of approximately 250,000 cubic yards presented and analyzed in the Draft EIR is correct.

Response ORG-3-27:

Please refer to Response ORG-3-26. As shown in Draft EIR Table 4.4-1 (Estimated Grading/Cut and Fill and Non-grading Related Excavated Material Balance), the majority of the estimated 180,000 cubic yards of grading required for site development is for solar field infiltration trenches (approximately 111,000 cubic yards) and permanent access roads (50,000 cubic yards) and other Project facilities which are required irrespective of the solar panel option selected. Similarly, as shown in Draft EIR Table 4.4-1, the majority of on-site excavations (non-grading related) are associated with underground utility trenches and transmission pole foundations which are required irrespective of solar panel options. As shown in Draft EIR Table 4.4-1, the only pertinent difference in grading-related cut and fill between solar panel options is for trackers (i.e., versus fixed tilt), which are estimated to require a total of 10,050 cubic yards of cut for drive motor foundations. The maximum grading and excavation requirements for site development (i.e., including the aforementioned 10,050 cubic yards of cut for drive motor foundations) are presented in the Project Description and have been considered in applicable environmental resource assessments, including air quality. As stated in Draft EIR Air Quality Section 5.6.3.2.1 (Development of Construction Emissions), the cut and fill and excavation quantities utilized in the air quality assessment are as presented in Draft EIR Table 4.4-1.

Response ORG-3-28:

As discussed in Draft EIR Section 5.6.3.2.1, the large majority of water used during construction would be for dust control. Use of driven piles versus concrete ballast foundations would not substantially alter construction water use requirements. The foundation scenario selection process will be based on panel support type and site specific geotechnical considerations and not associated temporary minor water usage requirements. The worst-case estimate of water usage during construction is 150 AFY as stated and analyzed throughout the Draft EIR.

The Drainage Concept Report for the Project (Appendix C to the Draft EIR) evaluated the concrete ballast design as the worst case design scenario with respect to reduction in infiltration rates on the site associated with an increase in impervious areas. The report identified a design of infiltration basins to be constructed on the site that would adequately compensate for the reduced infiltration created by the ballast foundation design, resulting in less than significant impacts from the Project. Therefore, the worst case design results in an acceptable level of impacts, and no further evaluation is necessary.

Response ORG-3-29:

The Draft EIR does not fail to identify the need for a Stream Alteration Agreement, as discussed in Draft EIR Section 5.7.3.2.2. A Stream Alteration Agreement is not required for the Project. The proposed Project avoids disturbance of all four ephemeral washes on the Project site and provides adequate setbacks to avoid indirect impacts to the on-site drainages. The Project does not include installation of any Arizona crossings on the jurisdictional portion of Drainage A or elsewhere. The proposed cutoff wall is setback a minimum of 100 feet from Drainage A which is sufficient to avoid impacts to Drainage A.

The comment describes language in Section 1600 *et seq.* of the California Fish and Game Code related to Streambed Alteration Agreements, restates information contained in the Draft EIR related to the existing configuration of jurisdictional streambeds on-site, and asserts that the project would impact all four drainage channels on-site. The comment cites the Notice of Preparation (NOP) for the EIR, included in Appendix A to the Draft EIR, which describes the construction of "Arizona Crossings" and other drainage modifications as components of the Project. The County issued the NOP on April 29, 2009, more than one year prior to the release of the Draft EIR. During the intervening period, the Applicant voluntarily proposed changes to the description of the proposed Project intended to avoid impacts to jurisdictional streambeds. The description of the Project presented in Section 4.0 of the Draft EIR, including Figure 4.4-1A, reflects these changes, as does the impacts analysis presented in Section 5.7.3. As stated in Draft EIR Section 5.7.3.2.2, and shown on Figure 4.4-1A, no modifications or improvements within on-site drainages are proposed. The proposed buried

sheet piles parallel to Drainage A would be installed no less than 100 feet from the edge of the jurisdictional drainage, and would not divert, obstruct, or substantially alter the existing streambed. Given these considerations, the proposed activities would not require authorization from CDFG under Section 1600 *et seq.* of the Fish and Game Code. Figure 4.4-1A (Facility Site Plan) of the Draft EIR does not depict impacts to jurisdictional portions of all four (or any of the four) drainages on the Project site as purported by the commenter.

Response ORG-3-30:

The Draft EIR does not fail to identify the need for a Stream Alteration Agreement. See Response ORG-3-29. Accordingly, the Draft EIR neither violates the CEQA Guidelines nor improperly piece meals its environmental review of the Project.

Response ORG-3-31:

This is a general comment that introduces subsequent comments claiming that the Draft EIR employs an inaccurate and incomplete baseline. The subsequent comments specify this claim regarding air quality, biological, groundwater and subsidence, soil conditions, and visual resources. As specifically addressed in Responses ORG-3-33 through ORG-3-41, ORG-3-43, and ORG-3-45 through ORG-3-52, in accordance with CEQA Guidelines Section 15125, the Draft EIR describes the physical environmental conditions for the Project site, the proposed transmission line, and the vicinity of the Project as they existed at the time the Notice of Preparation was published. In addition, the environmental setting is used to constitute the baseline physical conditions by which an impact is determined to be significant.

Response ORG-3-32:

Section 5.6.2 of the Draft EIR identifies the means by which individuals may be exposed to Valley Fever, current meteorological and air quality conditions, and existing activities lending to the risk level of Valley Fever in the Project area, as well as the frequency of infection in the Project region. Section 5.6.2.5 also states that "At present, the local population is exposed to significant levels of dust, and the dust in the region is believed to contain the *C. immitis* fungi, thus the local population is most likely exposed to *C. immitis* fungi (i.e., Valley Fever)." This baseline information provides sufficient description of the environmental setting with respect to Valley Fever in order to provide an understanding of the potential significant effects of the Project, in accordance with CEQA Guidelines Section 15125. Refer to Response ORG-3-33.

Response ORG-3-33:

As discussed in Draft EIR Section 5.6.2.5 (Valley Fever in California and the Project Area), much of the land adjacent to the proposed Project area is zoned for agricultural use. The

Project site is not currently active agricultural land, but agricultural activities are ongoing in nearby areas. Dust from tilled agricultural land and off-road vehicles contribute to the current level of background dust near the site. The majority of dust in the region is generated from agricultural and off-road activities and wind storms. High wind episodes, when the wind speed is greater than 25 mph, occur approximately 5 percent of the time at the Poppy Park Remote Automated Weather Station (RAWS) just east of the Project site. The region is non-attainment for particulate matter, with the majority of these emissions occurring in the form of dust. At present, the local population is exposed to substantial levels of dust, and the dust in the region is believed to contain the *C. immitis* fungi, thus the local population is most likely exposed to *C. immitis* fungi (i.e., Valley Fever).

As discussed in the Draft EIR Section 5.9.2.1 (Agricultural Resources, Project Site), the Project site is located within the Antelope Valley Planning Area, which contains the largest amount of productive farmland in Los Angeles County. Agricultural uses comprise about 62,772 acres (approximately 40 percent) of land currently in use in the Antelope Valley Planning Area and agricultural uses in the Planning Area include grazing lands, alfalfa, orchards for stone fruits, and vineyards (LACDRP 2009). Agricultural activities in the Project site area vary from year to year but included large areas to the north and northeast of the Project site at the time the NOP was issued and the associated Draft EIR studies were performed.

The assessment of Valley Fever in Draft EIR Section 5.6 (Air Quality) identifies the existence and associated hazards of the *C. immitis* fungi, including the existing exposure of the local population and the relationship of dust generation activities (manmade and natural) to exposure. Draft EIR Section 5.6.4 (Cumulative Impacts) concludes that construction emissions from the Project would not result in cumulatively considerable increases in fugitive dust emissions. The total estimated Project specific emissions of PM_{10} over the 38-month construction period equate to approximately 0.04 percent of the total estimated emissions within the AVAQMD in 2008 (most recent data available).

As summarized in Draft EIR Section 5.6.6, the proposed Project would generate dust during the construction phase associated with ground disturbing activities and vehicular/equipment movement on unpaved surfaces. These dust-generating activities have the potential to increase the risk of exposure to Valley Fever (*C. immitis* fungi). With implementation of mitigation measures focused on reducing fugitive dust emissions and exposure (i.e., Mitigation Measures [MM] 5.6-1, 5.6-2, and 5.6-3) and MM 5.6-11 (Off-road Equipment Operator Worker Protection), the additional risk associated with dust and possible Valley Fever exposure would be substantially reduced in accordance with established risk minimization measures and would be considered less than significant for both Project direct and cumulative effects.

Response ORG-3-34:

The comment asserts that the Draft EIR failed to establish an adequate biological baseline because the survey data were limited to the Project boundaries. Consistent with CEQA Guidelines Section 15126.2(a), the Draft EIR considers and discusses the existing physical conditions of the potentially affected area. Numerous, full-coverage field surveys of the Project site were conducted to establish the existing biological conditions for purposes of the Draft EIR, as described in Draft EIR Section 5.7. Adjacent lands were not surveyed, because these lands are under private ownership by parties other than the Applicant, and the biological resources survey team did not have permission to access the lands for survey purposes. However, reviews of pertinent literature sources, including publicly available environmental documents and the spatial mapping data provided by the CDFG's California Natural Diversity Database (CNDDB) were conducted for the entire Project vicinity, and were not limited to the Project boundaries. While adjacent lands were not physically surveyed due to access constraints, the Draft EIR nevertheless considered resources within those lands in its analysis.

Response ORG-3-35:

The comment asserts that areas adjacent to the Project site, including adjacent areas bounded on two or more sides by the proposed Project, should be surveyed for biological resources with the same intensity as the Project site due to the potential for wildlife to move on and off of the site in these areas. As described in Response ORG-3-34, evaluation of off-site lands at the same level of detail as the Project site was not feasible due to access constraints, and was not necessary to ascertain baseline conditions in support of impact assessment for biological resources. In addition, the Project design features a minimum setback of 80 to 130 feet between the site boundaries and proposed solar arrays (see Draft EIR Figure 4.4-1A), which would minimize the potential for impacts to off-site biological resources.

Response ORG-3-36:

The comment points out that the proposed gen-tie is a component of the Project, and asserts that the Draft EIR and supporting materials fail to provide any information regarding survey efforts along the transmission line or Whirlwind Substation site. This assertion is incorrect. As described in Appendix E to the Draft EIR, biological field surveys of the transmission line route were conducted on February 3; March 26; April 8, 22, 23, and 30; May 1 and 8; and June 9 and 10, 2009. The surveys conducted were similar in scope and intensity to those undertaken within the Project site, and included vegetation mapping, general wildlife surveys, focused floristic surveys, protocol surveys for the burrowing owl, Joshua tree mapping, nesting bird surveys, and jurisdictional drainage delineations (Draft EIR Appendix

E, Table 4-1). In addition, biological surveys of the expanded study area surrounding the proposed transmission line route in Kern County were conducted in January 2010.

No surveys were performed within the Whirlwind Substation site, as that facility is not a component of the proposed Project. The Whirlwind Substation is part of the SCE Tehachapi Renewables Transmission Project, and has been previously evaluated under CEQA through an EIR prepared by the California Public Utilities Commission.

Response ORG-3-37:

Please refer to Response ORG-3-21. The comment asserts that the Draft EIR fails to identify the access roads necessary to construct and maintain the proposed transmission line, and that additional biological surveys may be needed. As described in Draft EIR Section 4.4, the proposed transmission line route would be installed partially within the right-of-way of 170th Street West, and partially on private lands. Where transmission line poles would be constructed outside the existing road right-of-way (applicable to Kern County portion), access would be obtained via a series of proposed construction pathways that would link the construction zones to 170th Street West (Draft EIR Section 4.4.6.7.6). Because of the route's close proximity to this existing roadway, no additional construction/maintenance access road along the transmission line is proposed. Refer to Response ORG-3-36 for information regarding the biological studies completed for the entire length of the transmission line.

Response ORG-3-38:

The comment asserts that because the biological surveys for the Project site were directed towards birds and plants, these surveys do not constitute substantial evidence regarding the presence of "terrestrial vertebrae." As stated in Draft EIR Appendix E, general surveys for wildlife were incorporated into the other surveys conducted within the Project site. This practice was associated primarily with the focused botanical surveys and protocol burrowing owl surveys of the site, because these surveys required intensive, repeated pedestrian transects of the entire site. While it is true that surveys for the burrowing owl are technically "bird surveys," these surveys do not involve "looking upwards at birds" as the commentor suggests. During the burrowing owl transect surveys, survey effort is directed at the ground in an attempt to identify small mammal burrows or other features that may be suitable for use by burrowing owls, as well as other owl signs such as pellets and white wash. Likewise, focused botanical surveys also require careful examination of the ground in an effort to detect and identify low-growing plant species. The substantial number of full-coverage, pedestrian transect surveys conducted during the spring of 2009 were adequate to compile baseline information regarding biological resources within the site, including terrestrial vertebrates.

Response ORG-3-39:

According to the California Burrowing Owl Consortium Protocol (CBOC 1993), Phase III burrowing owl surveys are intended to determine "if, when, and how the site is used by burrowing owls." The initial site visit in this Phase III survey effort is dedicated to examining burrows previously identified as potential owl burrows for evidence of owl occupation. The three subsequent visits to determine use of the site by owls are to be conducted "from two hours before sunset to one hour after or from one hour before to two hours after sunrise" (CBOC 1993). Following this protocol, after an initial Phase III visit to check burrows for signs of owl occupancy, subsequent visits were conducted from two hours before sunset to one hour after (see Table 4-1 of the Biota Report, Draft EIR Appendix E). Prior to conducting Phase III surveys, Phase II surveys were conducted "for burrows and owls," following the CBOC protocol. This protocol makes no stipulation of what time of day these surveys should take place, or what conditions are suitable for conducting surveys (CBOC 1993). And, as these surveys involve walking straight-line transects over the entire site, it is not practical to perform them in darkness.

Winds exceeded 20 mph for a portion of both the April 30 and May 6, 2009 Phase II evening burrowing owl surveys. However, weather data for the period April 23-May 31, 2009 show that winds exceeded 20 mph on 27 of 38 evenings, at the time of day specified for evening surveys in the CBOC protocol. Therefore, winds encountered on April 30 and May 6, which only exceeded 20 mph for part of the surveys and never exceeded 27 mph, appear to be normal for this time of year, at this location. In addition, during the April 30 and May 6 surveys, owls were observed at all locations identified as potentially supporting burrowing owls. These areas are those identified in the Draft EIR as supporting burrowing owls, and that are excluded from development. No areas identified after Phase II and the initial Phase III survey as potentially supporting burrowing owls are within the project footprint. In summary, the burrowing owl surveys and assessment performed for the Project provide adequate baseline data to establish existing burrowing conditions analyzed in the Draft EIR.

Response ORG-3-40:

CEQA Guidelines section 15125(a) provides: "An EIR must include a description of the physical environmental conditions in the vicinity of the project, as they exist at the time the notice of preparation is published . . . from both a local and regional perspective. This environmental setting will normally constitute the baseline physical conditions by which a lead agency determines whether an impact is significant." However, "the date for establishing baseline cannot be a rigid one. . . . In some cases it is necessary to consider over a range of time periods." (*CBE v. SCAQMD*, 48 Cal.4th 310, 327-328 (2010) (quoting *Save Our Peninsula*, 87 Cal.App.4th at 125).) "Neither CEQA nor the CEQA Guidelines mandates a uniform, inflexible rule for determination of the existing conditions baseline. Rather, an

agency enjoys the discretion to decide, in the first instance, exactly how the existing physical conditions without the project can most realistically be measured, subject to review, as with all CEQA factual determinations, for support by substantial evidence. (*CBE v. SCAQMD*, 48 Cal.4th 310, 327-328 (2010) (citing *Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho Cordova*, 40 Cal.4th 412, 435 (2007)).)

As discussed in Responses ORG 3-41 through 3-45, the Draft EIR does not use groundwater use dating back to 1990 or a theoretical entitlement to groundwater as the environmental baseline for Project impacts.

Response ORG-3-41:

The Draft EIR does not use groundwater use dating back to 1990 as the environmental baseline for the Project. Rather, the Draft EIR discusses the historic water usage on the project site in the context of the current Adjudication of the Antelope Valley Groundwater Basin. Accordingly, Draft EIR Section 5.14.2.1.1 provides information about the Antelope Valley Groundwater Basin Adjudication, which is expected to determine all groundwater pumping rights in the Basin. As discussed in Draft EIR Section 5.14.3.2.1, LACDRP developed a refined threshold of significance for projects in the Antelope Valley Groundwater Basin that rely upon groundwater. This analysis requires a determination of whether the Project's groundwater usage would be consistent with the amount of groundwater reasonably estimated to be allocated to the Project site as its share of the native safe yield for the Antelope Valley Groundwater Basin. Accordingly, the Draft EIR discusses historical water usage within the Antelope Valley Groundwater Basin as it has implications for resolution of claims of prescription and claims of overlying owners to quiet title to water rights, as well as the final allocation of water rights in the Adjudication. As discussed in Draft EIR Section 5.14.2.1.1 and Appendix J2, the relevant period for determining historic water usage within the Antelope Valley Groundwater Basin in the Adjudication is likely to be a 5-year period in the 1990s to be determined by the Court. Accordingly, Draft EIR Section 5.14.2.1.2 discusses the historical water use at the Project site during a period that may be contemplated by the Adjudication and be relevant to the Project site's allocation. As discussed in Draft EIR Section 5.14.3.2.1, the historical water usage was considered to determine that the Project's water usage would be a significant reduction from the amount of water estimated to be allocated to the Project site as its share of the safe yield for the Basin as determined in the Adjudication.

Response ORG-3-42:

As discussed in Responses ORG-3-40 and ORG-3-41, the historical groundwater usage was not discussed as the physical environmental conditions in the vicinity of the Project site as it existed at the time the environmental review commenced. Nor was historical groundwater

usage assessed to provide a description of current conditions. Nor did the Draft EIR make a determination based on a groundwater entitlement that has not been made nor did it fail to measure the Project's impacts against the real conditions on the ground.

The Draft EIR adequately described the physical environmental conditions in the vicinity of the Project site. The groundwater use as of the date the NOP was filed for the Project in April 2009 was approximately 1 AFY. As discussed in Draft EIR Section 5.14.2.1.1, there is an adequate groundwater supply in the Project area within the western portion of the Basin to meet the Project's water use based on historic groundwater contour data, well records in the Project area, and a well investigation/pump test performed on an on-site groundwater well. In addition, according to the Antelope Valley Integrated Regional Water Management Plan, groundwater is considered a reliable water source in the Antelope Valley Groundwater Basin. Refer to Responses ORG-3-65, ORG-3-66, ORG-3-67, and ORG-3-70 for more information.

The Antelope Valley Groundwater Basin is in Adjudication. Accordingly, Draft EIR Section 5.14.2.1.1 provides information about the Antelope Valley Groundwater Basin Adjudication, which is expected to determine all groundwater pumping rights in the Basin. As discussed in Draft EIR Section 5.14.3.2.1, LACDRP developed a refined threshold of significance for projects in the Antelope Valley Groundwater Basin that rely upon groundwater. This analysis requires a determination of whether the Project's groundwater usage would be consistent with the amount of groundwater reasonably estimated to be allocated to the Project site as its share of the native safe yield for the Antelope Valley Groundwater Basin. Accordingly, the Draft EIR discusses historical water usage within the Antelope Valley Groundwater Basin as it has implications for resolution of claims of prescription and claims of overlying owners to quiet title to water rights, as well as the final allocation of water rights in the Adjudication. As discussed in Draft EIR Section 5.14.2.1.1 and Appendix J2, the relevant period for determining historic water usage within the Antelope Valley Groundwater Basin in the Adjudication is likely to be a 5-year period in the 1990s to be determined by the Court. Accordingly, Draft EIR Section 5.14.2.1.2 discusses the historical water use at the Project site during a period that may be contemplated by the Adjudication and be relevant to the Project site's allocation.

Response ORG-3-43:

As discussed in Responses ORG-3-41 and ORG-3-42, the historic water usage is not discussed as representing the physical environmental condition or baseline, but rather is included because it is relevant to the Adjudication and has implications on the Project site's allocation of groundwater in the Adjudication. The comments regarding agricultural activities at the Project site and Antelope Valley Groundwater Basin are noted. Where no documentation is available, CEQA allows "good faith estimates of actual historical use." (*Save Our Peninsula*, 87 Cal.App.4th at 143 (stating, in a baseline context, "water figures [in

the EIR] shall reflect actual water use on the property, where possible, and methodologies for determining baseline shall be supported by evidence of actual water use on the property or, where no documentation is available, by good faith estimates of actual historical use.”).) Draft EIR Section 5.14.2.1.2 discusses the historical water usage data based on acreages of crops under cultivation provided by the previous property owner. The estimated historical water use to irrigate alfalfa on the Project site between approximately the late 1960s through the early 1990s was approximately 776 AFY. The estimated historical water use to irrigate onions as recently as 2004 was 392 AFY.

Response ORG-3-44:

As discussed in Draft EIR Section 5.14.2.1.2, the groundwater use as of the date the NOP was filed for the Project in April 2009 was approximately 1 AFY. The groundwater was used from the farm residence well for domestic purposes at the farmhouse. The Applicant and the previous property owner had a rental agreement for the Property in 2009, and the previous property owner occupied the farm residence in April 2009. As discussed in Responses ORG-3-41 and ORG-3-42, the historic water usage is not the physical environmental condition or baseline, but is relevant to the Adjudication process and has implications on the Project site’s allocation in the Adjudication. As discussed in Response ORG-3-45, the Draft EIR includes a description of the physical environmental conditions in the vicinity of the Project site, as they existed at the time the NOP was published, from both a local and regional perspective. (CEQA Guidelines §15125(a).)

Response ORG-3-45:

The Draft EIR includes a description of the physical environmental conditions in the vicinity of the Project site, as they existed at the time the NOP was published, from both a local and regional perspective. (CEQA Guidelines §15125(a).) As discussed in Draft EIR Section 5.14.2.1.1, groundwater extractions have exceeded the estimated natural recharge of the Antelope Valley Groundwater Basin since the 1920s, which has resulted in declining water levels and land subsidence primarily in the eastern portion of the Antelope Valley Groundwater Basin. Draft EIR Section 5.14.2.1.1 states that currently, the demand for water in the Antelope Valley exceeds the available supplies. The average annual native recharge plus local return flows is currently estimated as approximately 82,300 AFY. Coupled with return flows from imported water, the total sustainable yield of the Antelope Valley Groundwater Basin is estimated to be approximately 110,000 AFY. Current groundwater extraction rates are estimated to be approximately 160,000 AFY. Since groundwater extractions have exceeded the estimated natural recharge of the Antelope Valley Groundwater Basin, the Basin may be in overdraft.

As discussed in Draft EIR Section 5.14.2.1.2, the groundwater use as of the date the NOP was filed for the Project in April 2009 was approximately 1 AFY. Draft EIR Section 5.14.2.1 and Appendix J discuss groundwater in the vicinity of the Project site. A well investigation was performed within the Project area portion of the Antelope Valley, which included a review of well data within the Project area dating back to 1960 and groundwater contour data. Based on the well investigation, the groundwater levels at the Project site appear to have been stable or increasing since 1961. The well investigation test performed on-site demonstrates that the Project's required groundwater use would result in minimal impact to surrounding wells. (See Draft EIR Appendix J, Figure A6.) Draft EIR Section 5.14.3.2.1 determined there is an adequate groundwater supply in the Project area within the western portion of the Basin to meet the Project's water use based on historic groundwater contour data, well records in the Project area, and a well investigation/pump test performed on an on-site groundwater well. In addition, according to the Antelope Valley Integrated Regional Water Management Plan, groundwater is considered a reliable water source in the Antelope Valley Groundwater Basin.

Response ORG-3-46:

The Draft EIR's project description contains information necessary for evaluation and review of the Project's environmental impact. (CEQA Guidelines § 15124.) Draft EIR Section 5.14.2.1.1 discusses groundwater pumping activities at and in the vicinity of the Project site. The Project site overlays the western portion of the Antelope Valley Groundwater Basin. A well investigation performed by URS within the Project area included a review of well data within the Project area dating back to 1960, which indicated that water levels have risen and/or stabilized in most wells in the vicinity of the Project site (URS 2009) since the 1960s. URS also reviewed groundwater contour data from Durbin (1978) and RWMG (2007). Section 5.14.3.2.1 analyzes that well data and other relevant groundwater resource information to reach the reasonable conclusion based on substantial evidence that no significant impact is expected on surrounding groundwater resources from the Project's proposed pumping during construction and operation.

As discussed in Draft EIR Section 5.14.2.1.2 and Appendix J, as part of the groundwater investigation for the Project site, water levels and well records were obtained and evaluated for all available wells upgradient and downgradient for the an area about 100 square miles surrounding the Project site. Average well yields, wells depths, and water level records for that data are presented in Draft EIR Appendix J. In addition, the Draft EIR includes the water level record (for the past 60 years) for the USGS monitoring well 8N14W-18N1 located approximately 0.5 mile northeast and downgradient from the Project site. Draft EIR Appendix J (Figure 5) presents a clear visual record of the results of water use and groundwater conditions in the Project area.

Response ORG-3-47:

The LACDRP respectfully disagrees with the comment that the Draft EIR's analysis of baseline conditions in the Antelope Valley Groundwater Basin is gravely flawed. Draft EIR Section 5.14 relies upon several references to describe the physical environmental condition including:

- California Department of Water Resources (DWR). 2004. California's Ground Bulletin 118: South Lahontan Hydrologic Region, Antelope Valley Groundwater Basin. February 27, 2004.
- California Integrated Water Management Board (CIWMB). 2009. Jurisdiction Profile for Los Angeles County (Unincorporated). 2009.
- Durbin, T. J. 1978. Calibration of a Mathematical Model of the Antelope Valley Ground-Water Basin, California. Geological Survey Water-Supply Paper 2046.
- Kern County Planning Department (KCPD). 2008. Willow Springs Specific Plan. Adopted March 16, 1992. Amended April 1, 2008.
    - 2007. Kern County General Plan. Adopted June 15, 2004. Amended March 13, 2007.
    - 2006. Antelope Valley Water Bank Project (SCH# 2005091117), Final Environmental Impact Report. April 2006.
- Larsen, J. 2010. Larsen Ranch (previous property owner). Personal communication with URS Corporation (P. Menk). March 6, 2010.
- Los Angeles County Department of Public Works (LACDPW). 2010. Letter from Dennis Hunter to Sorin Alexanian dated June 10, 2010 and attached Technical Memorandum (Water Requirements and Groundwater Supply AV Solar Ranch One) dated June 1, 2010 prepared by Joseph C. Scalmanini.
- Regional Water Management Group (RWMG) for the Antelope Valley Integrated Regional Water Management Plan. 2007. Antelope Valley Integrated Water Management Plan. 2007.
- URS. 2009. Groundwater Characteristics at the AV Solar Ranch One Site in Southwestern Antelope Valley, Los Angeles County, California. November.
- U.S. Department of the Interior, U.S. Geological Survey (USGS). 2003. Simulation of Ground-Water Flow and Land Subsidence in the Antelope Valley Ground-Water Basin, California (Water Resources Investigations Report 03-4016). 2003.
- 1993. Draft Study Plan for the Geohydrologic Evaluation of Antelope Valley, and Development and Implementation of Ground-Water Management Models. 1993.

The memorandum from Dennis Hunter with Los Angeles County Department of Public Works to Sorin Alexanian with LACDRP dated June 10, 2010, attached a Technical Memorandum (Water Requirements and Groundwater Supply AV Solar Ranch One) dated June 1, 2010, prepared by the County's groundwater expert Joseph C. Scalmanini. Collectively, the memorandum from Dennis Hunter and the attached Technical Memorandum prepared by Joseph C. Scalmanini are cited in the Draft EIR as LACDPW 2010. LACDPW 2010 is found at Draft EIR Appendix J2. As discussed in Draft EIR Section 5.14.2.1.1 and Appendix J2, currently, the demand for water in the Antelope Valley exceeds the available supplies. The average annual native recharge plus local return flows is currently estimated as approximately 82,300 AFY. Coupled with return flows from imported water, the total sustainable yield of the Antelope Valley Groundwater Basin is estimated to be approximately 110,000 AFY. Current groundwater extraction rates are estimated to be approximately 160,000 AFY.

Response ORG-3-48:

Draft EIR Section 5.14.2.1.1 includes a description of the physical environmental conditions at the Antelope Valley Groundwater Basin to inform the public and decision makers. Draft EIR Section 5.14.2.1.1 cites to the U.S. Department of the Interior, U.S. Geological Survey, Simulation of Ground-Water Flow and Land Subsidence in the Antelope Valley Ground-Water Basin, California (Water Resources Investigations Report 03-4016) (2003), included as attachment G to Comment Letter ORG-3, to inform that groundwater extractions have exceeded the estimated natural recharge of the Antelope Valley Groundwater Basin since the 1920s, which has resulted in declining water levels and land subsidence primarily in the eastern portion of the Antelope Valley Groundwater Basin. Draft EIR Section 5.14.2.1.1 states that currently, the demand for water in the Antelope Valley exceeds the available supplies. The average annual native recharge plus local return flows is currently estimated as approximately 82,300 AFY. Coupled with return flows from imported water, the total sustainable yield of the Antelope Valley Groundwater Basin is estimated to be approximately 110,000 AFY. Current groundwater extraction rates are estimated to be approximately 160,000 AFY. Since groundwater extractions have exceeded the estimated natural recharge of the Antelope Valley Groundwater Basin, the Basin may be in overdraft. In an Order scheduling the Third Phase of the Trial in the Adjudication, the Court stated that it will hear evidence as to whether the Basin is in overdraft.

Response ORG-3-49:

The comment states that the Draft EIR fails to disclose baseline soil conditions as described in a prior Phase I Environmental Site Assessment (ESA) prepared by a consultant in 2007. On the contrary, Draft EIR Section 5.15.3.2.3 identifies the potential for contaminated soils due to past uses on the site, including pesticides as a result of agricultural activities. The 2007

Phase I ESA recommended soil sampling within the 80 acres south of the ranch area. The Draft EIR identifies Mitigation Measure 5.15-1 (Additional Assessment, and Possibly Remediation of Potentially Contaminated Soils on the Project Site), which requires sampling (i.e., Phase II ESA) over the entire Project site (approximately 2,100 acres), which encompasses the stated 80 acres south of the ranch residence as well as the remaining Project site area.

The comment states that the Draft EIR fails to state when onion farming commenced on the Project site. The Draft EIR identifies the best-known timeframe for agricultural production on the site (i.e., from at least the 1950s, farmed continuously until 1995, and had the last irrigated farming activity in 2004 for a crop of onions), and identifies the known historic crops, which for the purposes of this Draft EIR, is sufficient to analyze potential impacts and identify mitigation measures to result in less than significant impacts. The comment also states that the Draft EIR fails to disclose the types of pesticides that could have potentially been used on the site for onion cultivation, and refers to the commenter's sub-contractor comment letter (ORG-3A), which, lists four possible pesticides and cites a uniform resource locator (URL) to the Pesticide Action Network webpage listing more than 50 top pesticides used on onions in California in 2008. Listing four (or more than 50) potential pesticides that may or may not have been used on the site would not add meaningful data to the Draft EIR impact analysis, as the Draft EIR already identifies historic pesticide use as a potential contamination source, and identifies appropriate mitigation to result in less than significant impacts. Therefore, the Draft EIR presents sufficient information identifying existing baseline soil conditions at the Project site.

Response ORG-3-50:

The comment erroneously states that no documentation on how the post-construction KOP simulations were created were provided in the Draft EIR. The Draft EIR presents a detailed description of the simulation preparation in Section 5.10.3.4.2, which includes: a description of the equipment used (Fuji GX 617 panoramic camera providing a 2.25-inch by 6-inch film transparency, Nikon 12-megapixel digital camera with a 35-mm lens image, hand-held GPS unit, and various computer software [terrain model, computer-aided design, rendering software, etc.]); the steps and procedures followed to generate the simulations; and the methodology and purpose of the procedures. Draft EIR Section 5.10.3.4.2 also described methods employed to produce visual accuracy (for instance, use of a terrain model to align the Project computer model to the photographs, use of computer aided design (CAD) for life-sized modeling, use of global positioning systems [with coordinates depicted on Draft EIR Figure 5.10-1B] to accurately georeference facility equipment locations, color mapping and texturing of all modeled elements to simulate actual facility materials, simulating the lighting conditions at the time the photographs were taken. etc.). In summary, the Draft EIR provides

documentation on the simulation preparation that provides an adequate level of detail to address the accuracy and suitability of the simulations.

Response ORG-3-51:

Draft EIR Section 5.10 (Visual Qualities) presents two KOPs from SR-138: KOP 1, perspective facing west (see Draft EIR Figures 5.10-4 and 5.10-5); and KOP 2, perspective facing north at 170th Street West (see Draft EIR Figures 5.10-6 and 5.10-7). KOP 1 (looking west) was selected because the predominant public viewing perspective from SR-138 along that segment would be from a motorist traveling along SR-138. No public turnouts or resting locations are located along SR-138 at the Project site area where viewers are able to stop and gaze northward or southward into the privately-owned property. KOP 2 shows the view looking northward near the intersection of SR-138 and 170th Street West, and represents a feasible perspective of a motorist traveling north at the intersection, where major components of the Project are shown, including the solar array fields, operations and maintenance building, water tank area, and 34.5-kV and 230-kV transmission lines. As a result, KOP 1 and KOP 2 presented in the Draft EIR are considered adequate in representing the feasible views of the facility from the available public viewing locations.

Response ORG-3-52:

The comment implies that the Draft EIR should include a KOP at the Fairmont/Antelope Buttes area owned by the Santa Monica Mountains Conservancy. The Draft EIR analysis considered the Conservancy-owned public lands and the current status of the property without designated public trails. There is currently no public access to the Conservancy property. Accordingly, it cannot be assumed that there is a public viewing location; hence, this location was not selected for a KOP. As a result, KOP 3, which was selected based on its relative close proximity to the Project site from an existing trail at the Antelope Valley California Poppy Reserve with visible view (i.e., not topographically screened) of the Project site area, would be considered an appropriate public viewing location from near the Fairmont/Antelope Buttes area.

Response ORG-3-53:

As addressed in Response to Comments ORG-3-50, ORG-3-51, and ORG-3-52, the Draft EIR has adequately documented preparation of the KOP simulations, appropriately selected KOPs along SR-138, and has adequately selected KOP 3 as a representative a public viewing location from the Fairmont/Antelope Buttes area. As a result, the County disagrees with the unsupported claim asserted in this comment.

Response ORG-3-54:

The assessment of potential Project impacts related to C. immitis fungi (i.e., Valley Fever) presented in the Draft EIR Section 5.6 is not predicated on an assumption that there is no risk of public exposure based on past or current exposure of the local populace. The excerpt taken and cited by the commenter from Draft EIR Section 5.6.2.5 (Valley Fever in California and the Project Area) is part of the environmental baseline section and is relevant and accurate – i.e., the local populace in the Antelope Valley, including the Project area, is exposed to significant levels of dust that likely contains the C. immitis fungi. This is relevant background information, however, the impact finding is based primarily on the Project related risk which is mitigated to less than significant levels via implementation of substantial mitigating dust control and worker protection measures. Project construction activities with dust generation potential would be controlled in accordance with AVAQMD and Draft EIR mitigation requirements. With implementation of mitigation measures focused on reducing fugitive dust emissions (i.e., MM 5.6-1, 5.6-2, 5.6-3) and worker exposure (MM 5.6-11, Off-road Equipment Operator Worker Protection), the risk associated with dust exposure and possible Valley Fever exposure would be substantially reduced in accordance with established risk minimization measures and would be considered less than significant.

Response ORG-3-55:

As discussed in Draft EIR Section 5.6 (Air Quality), operation of the proposed Project would result in minimal emissions, including fugitive dust during the operational phase. All operational phase emissions, including fugitive dust, would be less than AVAQMD annual thresholds as demonstrated in Draft EIR Table 5.6-17 (Estimated Daily Maximum Operational Emissions of Criteria Pollutants. Estimated operational phase emissions of PM_{10} are estimated to be 18.1 pounds per day whereas the applicable AVAQMD standard is 82 pounds per day.

Response ORG-3-56:

As discussed in Response ORG-3-21, the proposed Project transmission line does not include an access road along the transmission line.

Response ORG-3-57:

The measures specified in Draft EIR Section 5.6.5 are adequate to substantially reduce and mitigate Project-related dust generation and the risk of Valley Fever in accordance with established risk minimization measures and potential impacts are considered to be less than significant. Please refer to Responses ORG-3-14, ORG-3-33, and ORG-3-54.

Response ORG-3-58:

Please refer to Responses ORG-3-14, ORG-3-33, and ORG-3-54. Mitigation Measure 5.6-2 (Develop and Implement Fugitive Dust Emission Control Plan) presented in Draft EIR Section 5.6.5 (Air Quality, Mitigation Measures) specifies appropriate, practical measures to substantially reduce fugitive dust emissions and associated Valley Fever exposure risk. In addition, Mitigation Measure 5.6-11 (Off-road Equipment Operator Worker Protection) in Draft EIR Section 5.6.5 specifies measures to protect construction workers involved with earth moving activities. With implementation of these established risk minimization mitigation measures, potential impacts are considered to be less than significant. No further analysis is warranted.

Response ORG-3-59:

Please refer to Responses ORG-3-14, ORG-3-33, ORG-3-54, and ORG-3-58 relative to fugitive dust comments. Please refer to Responses ORG-3-26 and ORG-3-27 relative to Project related cut and fill quantities. Emissions from installation of the cutoff wall which is proposed along both sides of the 100-foot setback for Drainage A are included in the construction air emission calculations presented in Draft EIR Appendix D and Section 5.6 (Air Quality). Installation of the subsurface cutoff wall would be performed with a vibratory pile driver and would not involve any soil excavation. The vibratory pile driving equipment activities would involve subsurface soil disturbance that would be subject to watering at the surface to control dust emissions, which would result in minimal dust emissions. All Project-related on-site construction activities would be subject to the fugitive dust control measures required under Mitigation Measure 5.6-2 (Develop and Implement Fugitive Dust Emission Control Plan), including compliance with AVAQMD Rule 403 requirements. With mitigation, AVAQMD emission thresholds for criteria pollutants, including PM_{10}, would not be exceeded during the construction and/or operational phases and fugitive dust emission impacts would be less than significant.

Response ORG-3-60:

Please refer to Responses ORG-3-14, ORG-3-33, ORG-3-54, and ORG-3-58.

Response ORG-3-61:

No trapping for the Mohave ground squirrel was done because the site is outside the species' known range, according to the most current information. The Laabs (2004) Mohave ground squirrel account cited in the Biota Report (Draft EIR Appendix E) is supported by information published by Leitner (2008) on the current and historic distribution of this species. Assembling a comprehensive database of occurrences of the Mohave ground squirrel, Leitner showed its historic range as ending more than 10 miles east of the site.

Trapping grids east of SR-14 yielded no occurrences of this species between 1998 and 2007, according to Leitner. Similarly, the California Natural Diversity Database, maintained by CDFG, includes no records for this species within 13 miles of the site. The Mohave ground squirrel data used in the Draft EIR is based on consistent, verified, and recent scientific data. As a result, consideration of Mohave ground squirrel in the Draft EIR is based on sound justification, and Project impacts are adequately addressed.

Response ORG-3-62:

Although the desert tortoise is known to occur in the Antelope Valley east of SR-14 and, from recent (2009) surveys, areas more than 15 miles to the northeast of the site, habitat on the site was judged to be unsuitable for desert tortoise. USFWS concurred that desert tortoises were unlikely to occur on the site, and that protocol surveys for this species were unnecessary (see Ray Bransfield's [USFWS] email response in Draft EIR Appendix A.3 Agency Coordination regarding Notice of Preparation Response.) For further details regarding communications with USFWS, please refer to Response ORG-3B-7.

Response ORG-3-63:

Biological surveys suggest that the Greater roadrunner was absent from the orchard and from the adjacent residential compound in 2009. A bird survey of the orchard and ornamental trees was conducted on June 10, 2009. According to Kiff and Irwin (1987), 92 greater roadrunner egg sets collected in southern California were taken between early March and mid-July. The period in which nestlings are present, when bird nests are easier to find, is slightly later. Therefore, mid-June is a good time for detecting nests of this species. In addition, no roadrunners were seen in this area during breeding bird surveys (April 23 to June 10), when biologists walked the eastern edge of the orchard and performed point count surveys at the orchard edge and in full view of the residential area. The distinctive cooing of this species, audible up to 250 meters (800 feet; Hughes 1996), was never heard on-site. Therefore, even if the orchard or ornamental trees surrounding the on-site structures are suitable nesting habitat, surveys suggested this species did not breed at this location in 2009. The only observation of this large, relatively conspicuous species on the site was from the northeastern corner of the site, near suitable nesting habitat in Joshua tree woodland. Mitigation Measure 5.7-2, Off-Site Mitigation for Loss of Habitat (as modified; see Section 2.0, Revisions to the Draft EIR in this Final EIR), states that "Lands containing Joshua tree woodland habitat are desirable locations for off-site mitigation, due to the continuing loss and degradation of this resource." The proposed Project site development area avoids Joshua tree woodland areas, including the juvenile Joshua tree recruitment area avoidance area (and setback) on the Project site. The inclusion of Joshua tree woodland within off-site mitigation lands would provide more suitable habitat, and likely more extensive, nesting habitat than might be removed by development of the Project.

Response ORG-3-64:

A 100-foot buffer surrounding Drainage A was determined to be appropriate based on the nature of the site, the ephemeral flow regime within the drainage and the proposed surrounding uses. Because the site is topographically simple, and lacks well-defined drainage patterns, the opportunity for upstream activities to affect the stream is low. Also, because the proposed land use within the Project site is largely passive, and would not involve substantial levels of activity once constructed, chances for impacts to occur would be further minimized. It should be noted that Alternative 2 incorporates and analyzes a 1,500-foot setback from Drainage C (see Draft EIR Figure 6-1, Alternate Layout with Increased Setbacks). The Draft EIR specifically analyzes and addresses potential impacts due to hazardous materials use and storage during construction and operation in Section 5.15.3.2.1. The analysis identifies required implementation of a facility hazardous materials and hazardous waste management program for both construction and operation phases, proper transport of hazardous materials, fueling and maintenance procedures, and emergency response plan and procedures (refer to Draft EIR Section 5.15.3.2.1). Additionally, the Draft EIR addresses and mitigates the potential for dumping of other contaminants into on-site drainages with implementation of Mitigation Measure 5.3-1 (Erosion Control and Stormwater Management Measures), Mitigation Measure 5.5-1 (On-Site Wastewater Treatment System Feasibility Report), Mitigation Measure 5.7-5 (Biological Monitor), and Mitigation Measure 5.7-6 (Worker Environmental Awareness Program). Further, due to the low-gradient nature of the Project site, the potential for any spilled materials to traverse the 100-foot buffer and make their way into on-site drainage channels is remote. Also, because the drainage does not exhibit surface flows during most of the year, there would likely be opportunities for any spilled substance to be cleaned up prior to rain events.

Response ORG-3-65:

The Initial Study (Draft EIR Appendix A, Attachment 2) indicates that the Project site is in an area of "inadequate public supply," but does not indicate that the Project's impacts to water supplies are potentially significant. "Inadequate public supply" was checked because the public water purveyors do not currently provide water service to or in the near vicinity of the Project site. (See Draft EIR Section 5.14.2.1.1.) The Draft EIR includes extensive analysis regarding the project's potential impacts to water supplies and, based on that analysis, concludes that there would be a less than significant impact. As discussed in Responses ORG-3-42, ORG-3-45, and ORG-3-46, the Draft EIR includes extensive evaluation and analysis of historical water level and pumping data for the Project area, which was performed to determine that the Project's proposed groundwater use would not have a significant impact on groundwater resources.

Response ORG-3-66:

Refer to Response ORG-3-45. Available data indicate that the Antelope Valley Groundwater Basin may be in overdraft. However, as discussed in Response ORG-3-36, based on available data analyzed in the Draft EIR, water levels within the Project area have generally risen since the 1960s and appear to have stabilized. As discussed in Draft EIR Section 5.14.2.1.2, the historical water use on the Project site between approximately the late 1960s to early 1990s was approximately 776 AFY. As recently as 2004, the water use on the Project site was approximately 392 AFY. The historical well records from the USGS monitoring well do not evidence impacts of Project site groundwater pumping on surrounding wells. The proposed Project's estimated construction water use of 150 AFY (over a period of approximately 38 months) equates to less than 20 percent of the high historical groundwater us at the Project site. The Project's long-term operational water use of 12 AFY equates to less than 2 percent of the upper level of historical groundwater use at the Project site. Therefore, the Project's proposed groundwater use is anticipated to have a less than significant impact on nearby and surrounding wells and no mitigation is required.

The Draft EIR addresses the impacts of likely future water sources if groundwater ceases to be sufficient. Draft EIR Section 5.14.3.2.1 acknowledges the degree of uncertainty involved and "discusses the reasonably foreseeable alternatives." (See *Vineyard Area Citizens for Responsible Growth*, 40 Cal.4th at 432, 434) ("where, despite a full discussion, it is impossible to confidently determine that anticipated future water sources will be available, CEQA requires some discussion of possible replacement sources or alternatives to use of the anticipated water, and the environmental consequences of these contingencies.").) These alternatives include seeking transferable groundwater rights from a landowner and/or public water supplier or payment of an assessment to the Watermaster. Since such water would be within the total sustainable yield for groundwater pumping established for the Basin in the Adjudication, no significant impact would occur. The Draft EIR also discloses the significant foreseeable environmental effects of purchasing and trucking fresh and/or reclaimed water from sources in the general Palmdale/Lancaster area including wholesalers, retailers, or recycled water suppliers. Based on the air and traffic analysis conducted for the Project, the Draft EIR concludes that the level of truck traffic to truck water would not present a significant impact.

Response ORG-3-67:

Refer to Responses ORG-3-46, ORG-3-65, and ORG-66. Based on available data analyzed in the Draft EIR, water levels within the Project area have generally risen since the 1960s and appear stable. The proposed Project's estimated construction water use of 150 AFY (over a period of approximately 38 months) equates to less than 20 percent of the high historical groundwater us at the Project site. The Project's long-term operational water use of 12 AFY

equates to less than 2 percent of the upper level of historical groundwater use at the Project site. Therefore, the Project's proposed groundwater use is anticipated to have less than a significant impact on nearby and surrounding wells. As the Draft EIR included information about the potential environmental impacts of the Project on surrounding wells and determined that the Project will have less than a significant impact, LACDRP is not required to recirculate the Draft EIR prior to certification. (See CEQA Guidelines section 15088.5.)

Response ORG-3-68:

As discussed in the Draft EIR, implementation of the proposed Project would result in a potentially significant impact to on-site habitats for the majority of the site. This impact would be mitigated through the avoidance and enhancement of approximately 100 acres of on-site habitat, as well as through the acquisition and preservation of approximately 450 acres of off-site habitat in perpetuity. Within these areas, Mitigation Measures 5.7-1 and 5.7-2 (as modified; see Section 2.0, Revisions to the Draft EIR in this Final EIR) would require that coverage by invasive weeds be limited and maintained. In addition, requirements that herbicide use would require approval by LACDRP and would be applied by qualified personnel (Mitigation Measure 5.7-1) would limit unintentional effects of inappropriate herbicide use.

As mentioned in Draft EIR Section 5.7.3.2.5, discussing impacts to Blainville's horned lizards, burrowing owls, and other special-status bird species, the Project would result in new perching opportunities for common ravens within the site boundaries. However, existing vegetation that would be removed due to project development (ornamental trees, native and ornamental shrubs) already provides ample perching opportunities for this species, which is common on the site and in the Antelope Valley in general. Existing power poles along SR-138 and 170th Street West also provide perches and nesting sites for this species. Raven perching around the site perimeter, in particular, would have the potential to impact native wildlife, as these areas would be closest to the undisturbed natural habitats surrounding the site. However, slack wire to be incorporated on these fences would deter raven perching. The Project would not provide new drinking sites from landscape irrigation, as drip irrigation would be employed in the landscaped areas (all along SR-138), and no standing water would result. The off-site transmission line would use a design that would not encourage nesting by ravens. Wooden, on-site transmission lines may provide some nesting opportunities for ravens, but these would be located within the site and away from the undisturbed and more sensitive habitats at the site perimeter.

Response ORG-3-69:

Refer to Response ORG-3-40 for a discussion of CEQA Guidelines section 15125(a), which requires that an EIR include a description of the physical environmental conditions. As

discussed in Responses ORG-3-44, ORG-3-45, ORG-3-46, ORG-3-47, ORG-3-65, ORG-3-66, and ORG-3-67, Draft EIR Section 5.14 includes a description of the physical environmental conditions at the Project site and the Project vicinity at the time environmental review commenced.

CEQA Guidelines section 15064.7 authorizes the County to develop thresholds of significance. "A threshold of significance is an identifiable quantitative, qualitative or performance level of a particular environmental effect, noncompliance with which means the effect will normally be determined to be significant by the agency and compliance with which means the effect normally will be determined to be less than significant." (CEQA Guidelines § 16064.7(a).) The Antelope Valley Groundwater Basin is in Adjudication, which is expected to determine all groundwater pumping rights in the Basin. As discussed in Draft EIR Section 5.14.3.2.1, LACDRP developed a refined threshold of significance for projects in the Antelope Valley Groundwater Basin that rely upon groundwater, and require a determination of whether the Project's groundwater usage would be consistent with the amount of groundwater estimated to be allocated to the Project site as its share of the safe yield for the Antelope Valley Groundwater Basin. As discussed in Draft EIR Section 5.14.3.2.1, to be conservative, the Draft EIR analysis assumes that the Antelope Valley Groundwater Basin's native safe yield is 82,300 AFY, which is based on substantial evidence from the County's groundwater expert. (See Draft EIR Appendix J2.)

As discussed in Draft EIR Sections 5.14.2.1.1 and 5.14.3.2.1, the high historical water usage for the Project site is approximately 776 AFY during a period that may be contemplated by the Adjudication. The proposed Project's construction water usage of 150 AFY (over a period of approximately 38 months) equates to less than 20 percent of the high historical groundwater usage at the Project site. The Project's long-term operational need of 12 AFY equates to less than 2 percent of the upper level of historical groundwater usage at the Project site. Based on the historic groundwater usage at the Project site, it is anticipated that while an allocation of groundwater in the Adjudication may be significantly less than the upper level of historical groundwater usage of 776 AFY for the Project site, it is reasonably likely that the Project site's allocation would meet the Project's operational water requirements of 12 AFY. As an overlying owner with historic usage, the Applicant may assert defenses to claims of prescription and may secure a correlative right to groundwater as an overlyer in an amount sufficient to supply the Project. Therefore, because the Project's water usage would be a significant reduction from the amount of groundwater reasonably estimated to be allocated to the Project site, and would not likely exceed the Project's correlative share of the native safe yield, the Draft EIR determined that the Project would not result in a significant impact related to water supply. Refer to Response ORG-3-70 for more information.

Response ORG-3-70:

LACDRP disagrees with the comment that it confuses its requirement to determine whether the Applicant is legally entitled to use groundwater with its requirement to analyze significant impacts under CEQA.

As discussed in Draft EIR Section 5.14.3.2.1, currently, as the Project overlies the Basin, the Applicant has an overlying right to use groundwater from the Basin for the proposed Project. Draft EIR Section 5.14.3.2.1 determined that there is an adequate groundwater supply in the Project area within the western portion of the Basin to meet the Project's water use, and such use will not exceed the Project's correlative share of the native safe yield, based on historic groundwater contour data, well records in the Project area, and a well investigation/pump test performed on an on-site groundwater well. In addition, according to the Antelope Valley Integrated Regional Water Management Plan, groundwater is considered a reliable water source in the Antelope Valley Groundwater Basin.

As discussed in Responses ORG-3-41 and ORG-3-69, Draft EIR Section 5.14.3.2.1 also considers whether the Project's water use would be consistent with the amount of water estimated to be allocated to the Project site as its share of the native safe yield for the Antelope Valley Groundwater Basin to be determined by the Court in the Adjudication. As discussed in Draft EIR Section 5.14.3.2.1, based on the historical groundwater usage at the Project site, it is reasonably likely that the Project site's allocation in the Adjudication would meet the Project's minimal water demand. The Draft EIR concludes that because the Project's water usage would be a significant reduction from the amount of groundwater reasonably estimated to be allocated to the Project site, the Project would not result in a significant impact related to water supply.

Given the potential uncertainty inherent in the Adjudication, the Draft EIR section 5.14.3.2.1 also discussed reasonably foreseeable alternative water sources. (See *Vineyard*, 40 Cal.4th at 432, 434) ("where, despite a full discussion, it is impossible to confidently determine that anticipated future water sources will be available, CEQA requires some discussion of possible replacement sources or alternatives to use of the anticipated water, and the environmental consequences of these contingencies.").) These alternatives include seeking transferable groundwater rights from a landowner and/or public water supplier or payment of an assessment to the Watermaster. Since such water would be within the total sustainable yield for groundwater pumping established for the Basin in the Adjudication, no significant impact would occur. The Draft EIR also discloses the significant foreseeable environmental effects of purchasing and trucking fresh and/or reclaimed water from sources in the general Palmdale/Lancaster area including wholesalers, retailers, or recycled water suppliers. Based on the air and traffic analysis conducted for the Project, the Draft EIR concludes that the level of truck traffic to truck water would not present a significant impact.

Response ORG-3-71:

As discussed in Response ORG-3-48, because the groundwater extractions have exceeded the estimated natural recharge of the Antelope Valley Groundwater Basin, the Basin may be in overdraft. As discussed in Draft EIR Section 5.14.3.2.1 and Appendix J2, the Antelope Valley Groundwater Basin's native safe yield is 82,300 AFY. Whether a project has a significant effect on the environment may vary with the setting. (CEQA Guidelines §15064(b).) Under the *Kings County/Los Angeles Unified* approach, the relevant question under CEQA is whether "'any additional amount' of effect should be considered significant in the context of the existing cumulative effect. This does not mean, however, that *any* additional effect …. *Necessarily* creates a significant … impact; the 'one [additional] molecule rule' is not the law." (*CBE v. California Resources Agency*, 103 Cal.App.4th 98, 210 (2002) (emphasis in original).)

As discussed in Draft EIR Section 5.14.3.2.1, the Project's water demand comprises only 0.18 percent of the Antelope Valley Groundwater Basin's safe yield during construction, and 0.01 percent during operation. Moreover, Draft EIR Appendix J2 describes the Project's minimal water demand on a unitized basis. In the Antelope Valley Groundwater Basin, the unit water requirements for both agricultural and municipal land uses are within an overall range of about three to seven acre feet per acre per year (AF/A/YR). On a unitized basis, the Project's water demand would equate to about 0.07 AF/A/YR during construction and less than 0.01 AF/A/YR during operations (0.006 AF/A/YR). Appendix J2 concludes that the water requirements on the nearly 2,100 acre Project site are exceptionally small. As noted above, the one molecule rule is not the law. However, the percentage of proposed water use as compared to safe yield and assessment of Project water demand on a unitized basis are not the only factors considered to reach the conclusion that no significant impact to groundwater resources would occur. The small percentage of the Antelope Valley Groundwater Basin's safe yield, coupled with the historical groundwater contour data, well records in the Project area, and the well investigation/pump test performed on an on-site groundwater well indicate that there is an adequate groundwater supply in the Project area within the western portion of the Antelope Valley Groundwater Basin, and provide substantial evidence that the Project's use of groundwater taken from the Project site does not result in a significant impact.

As discussed in Responses ORG-3-45 and ORG-3-70, Draft EIR Section 5.14.3.2.1 determined that the Project site is in an area with an adequate groundwater supply. As discussed in Responses ORG-3-46, ORG-3-65, ORG-3-66, and ORG-3-67, based on available data analyzed in the Draft EIR, water levels within the Project area have generally risen since the 1960s and appear to be stable. Moreover, the proposed Project's estimated construction water use of 150 AFY (over a period of approximately 38 months) equates to less than 20 percent of the high historical groundwater us at the Project site. The Project's long-term operational water use of 12 AFY equates to less than 2 percent of the upper level

of historical groundwater use at the Project site. Therefore, based on substantial evidence, the Project's proposed groundwater use is anticipated to have less than a significant impact on nearby and surrounding wells. This determination is based upon substantial evidence in Draft EIR Section 5.14.2.1.1 about the existing environmental setting.

Moreover, there has been no land subsidence at the Project site or within the 60 square miles surrounding the Project site (USGS 2008, Figure 8). As discussed in Draft EIR Appendix J, conditions that could cause land subsidence (see USGS 2003) from groundwater withdrawal such as thick compressible clay layers and significant water level declines below the clay are not conditions that exist at the proposed Project site. Land subsidence in the Antelope Valley Groundwater Basin has primarily occurred in the eastern portion of the Antelope Valley Groundwater Basin in areas of thick lacustrine deposits and compressible clay layers, creating a two-layer aquifer system that has experienced land subsidence. Land subsidence is not evidenced until approximately 7 miles east of the Project site, and the area of greatest land subsidence in the deeper aquifer, directly below Lancaster, is located approximately 20 miles east of the Project site. USGS monitoring well 8N/14W-18N1 is located between the Project site and the area of measured land subsidence. This monitoring well has measured rising and stable water levels since the late 1960s, a condition contrary to land subsidence. Accordingly, land subsidence is not considered to be a potential Project effect.

As the Draft EIR included adequate analysis of the Project's impacts on the Antelope Valley Groundwater Basin and determined that the Project will have less than a significant impact, LACDRP is not required to recirculate the Draft EIR prior to certification. (See CEQA Guidelines section 15088.5.)

Response ORG-3-72:

This comment introduces subsequent comments claiming that the Draft EIR mitigation measures including those pertaining to Valley Fever, herbicide use, Joshua tree woodland, and special status species are ineffective. On the contrary, as specifically addressed in Responses ORG-3-73 through ORG-3-77, the Draft EIR mitigation measures are effective and appropriate in mitigating potential Project impacts in accordance with CEQA Guidelines Section 15370. The Draft EIR presents appropriate mitigation measures for all identified potentially significant impacts and all impacts are reduced to levels of insignificance with implementation of the mitigation measures specified in the Draft EIR, by environmental resource topic, in accordance with CEQA Guidelines Section 15126.4.

Response ORG-3-73:

The comment makes reference to "federal regulatory guidelines," citing the Office of Health and Safety, U.S. Department of Energy, Safety Advisory: Valley Fever. The Department of Energy (DOE) safety advisory is in regard to facility occupational and environmental

medicine program advisory information applicable to DOE facilities, and is not federal regulatory guidelines. Nonetheless, the Draft EIR identifies Mitigation Measures 5.6-2 (Development and Implement Fugitive Dust Emission Control Plan), 5.6-3 (Dust Plume Response Requirement), and 5.6-11 (Off-Road Equipment Operator Worker Protection) that are consistent with and identified in the DOE safety advisory recommendations, and are noted as being key to mitigating Valley Fever exposure in a more recent DOE health advisory.[1] As a result, the Draft EIR proposes adequate mitigation to substantially reduce potential effects of Valley Fever to less than significant levels.

Response ORG-3-74:

As pointed out by the commentor, Draft EIR Water Quality Section 5.5.3.2.4 explicitly states that no herbicides would be used within 100 feet of Drainages A and C, or within the development setbacks from Drainages B and D. Thus, where firebreaks are proposed within these areas, vegetation clearing would be accomplished through mechanical means, rather than through the use of herbicides. As described in Response ORG-3-64, the potential for herbicides to drift into drainages would be low, due to the buffers afforded and the topographically flat, arid nature of the site.

Response ORG-3-75:

The comment asserts that entire Project site was Joshua tree woodland prior to being converted to agriculture, and that the entire Project site should be treated as Joshua tree woodland in the process of recovering. As described in the Appendix E to the Draft EIR, vegetation communities within the Project site and transmission line route were mapped in accordance with currently accepted methods. In accordance with CEQA Guidelines Section 15125(a), the description of vegetation communities was based on the vegetation present at the time the environmental review commenced, rather than at some earlier time. Joshua tree woodlands were found to occur at certain locations along the proposed transmission line route (see Figure 5.7-8 in the Draft EIR), but are absent from the Project site.

Response ORG-3-76:

The comment asserts that the Project's mitigation ratios should be based on the loss of 2,100 acres of Joshua tree woodland, rather than on the few acres where Joshua trees have re-established. As described in Response ORG-3-75, the vegetation mapping conducted for the Draft EIR was consistent with the requirements of the State CEQA Guidelines with regard to timing of the baseline conditions. As stated in Draft EIR Section 5.7 (Biological Resources), Joshua tree woodland vegetation is absent from the Project site, but occurs along a portion of

[1] DOE. 2007. Valley Fever Cases Reported at Lawrence Livermore National Laboratory. Issue Number 2007-02, Article 2. February 28.

the transmission line route. Construction of the proposed transmission line would impact less than 0.1 acre of mapped Joshua tree woodland, and the transmission line would be sited to avoid all Joshua trees. As stated in the Draft EIR, this impact would be less than significant, and would not require mitigation.

Response ORG-3-77:

The comment asserts that 450 acres is not sufficient acreage to mitigate for the loss of 2,100 acres of natural habitat that supports many special-status species. The comment is somewhat inaccurate in citing the proposed impact and mitigation acreages; as stated in Draft EIR Section 5.7 (Biological Resources), Table 5.7-6A, the total acreage impacted (including both the Project site and the transmission line route) would total 1,955 acres, and the total acreage set aside for preservation and enhancement would total 550.6 acres (100.6 acres within the Project site and an additional 450 acres at an off-site location within the Antelope Valley). This acreage would adequately mitigate the Project's impacts on natural habitats for the following reasons:

- **The habitats present within the Project site are mostly common, and are representative of vegetation communities throughout the Antelope Valley floor.** Substantial acreage of rabbitbrush scrub and annual grassland vegetation occur in the valley, and some loss of these communities can be allowed to occur without substantially affecting the environment.
- **None of the special-status species that would be impacted by the proposed Project are listed under the ESA or CESA.** While some of the species affected are identified as California Species of Special Concern, and some are identified as sensitive only at the local level, species with these designations are by definition more secure (i.e., at lesser risk) than species that have been listed as threatened or endangered. A lower mitigation ratio for these species is appropriate.
- **Wildlife impacts would be limited to losses of foraging habitat in most cases.** Most of the sensitive species that utilize the Project site are birds, and many of these species do not nest within the site due to lack of suitable habitat. As described in Draft EIR Section 5.7, the Project site contains very few trees, a required component of nesting habitat for many species. Further, the take of adult birds, eggs, or nestlings is prohibited by federal and state law, and the Project would be required to avoid all take of this nature. Foraging habitat is generally more abundant than suitable nesting habitat for bird species, and loss of this type of habitat is generally less important to the species on an acre-for-acre basis.
- **The existing on-site habitats are recovering from substantial impacts sustained in the past, and do not exhibit the functions and characteristics of pristine native habitats.** As described in the Draft EIR, the Project site has been used historically for agricultural production, and signs of this use are evident and affect the ecological

function of the site. The absence of trees, most notably Joshua trees, limits suitability of the site for some species. Existing agricultural access roads, berms, and similar features exist within the site, and are generally colonized by a greater percentage of non-native species compared to the remainder of the site. In some areas, mono-cultures of fiddleneck have all but eliminated botanical diversity. Though these areas may be usable by wildlife for foraging purposes, they are far from ideal or pristine, making a lower mitigation ratio appropriate.

- **The proposed Project would not completely eliminate all potential for wildlife to use the site.** Unlike most residential, commercial, and industrial projects, which irreversibly grade and pave the lands proposed for development, the proposed Project would allow native soil to remain in place, and would allow the Project site to be vegetated during Project operation. Thus, while wildlife habitat suitability would be reduced by construction and operation of the Project, it is probable that the site would continue to provide some level of habitat function, particularly for foraging purposes.
- **The proposed mitigation lands would be enhanced and managed in perpetuity to ensure that habitat quality remains high.** As described in Draft EIR Mitigation Measure 5.7-1 (as modified; see Section 2.0, Revisions to the Draft EIR in this Final EIR), a Habitat Enhancement and Vegetation Management Plan would be prepared specifying habitat types, success criteria, and limitations that must be achieved by the on-site mitigation lands. Within the off-site mitigation areas, Mitigation Measure 5.7-2 (as modified, see Section 2.0, Revisions to the Draft EIR in this Final EIR) provides restrictions on invasive species cover and requires the Applicant to fund restoration, enhancement, and maintenance of the lands until they become self-sustaining and meet performance standards.

Response ORG-3-78:

As discussed in Response ORG-3-9, a WSA is not required for the Project and, accordingly, a WSA was neither prepared nor included in the Draft EIR. The Draft EIR presents a detailed analysis of groundwater resources and potential Project effects in Section 5.14, Appendix J, and Appendix J2.

Response ORG-3-79:

In accordance with Section 15121(a) of the CEQA Guidelines, the Draft EIR is an informational document which informs public agency decision makers and the public generally of: 1) the significant environmental effect of the Project; 2) identify possible ways to minimize the significant effects; and 3) describe reasonable alternatives to the Project. This Draft EIR was prepared in accordance with Section 15151 of the CEQA Guidelines, which states that:

> An EIR should be prepared with a sufficient degree of analysis to provide decision makers with information which enables them to make a decision which intelligently takes account of environmental consequences. An evaluation of the environmental effects of a proposed project need not be exhaustive, but the sufficiency of an EIR is to be reviewed in the light of what is reasonably feasible. Disagreement among experts does not make an EIR inadequate, but the EIR should summarize the main points of disagreement among the experts. The courts have looked not for perfection but for adequacy, completeness, and a good faith effort at full disclosure.

As discussed in Responses ORG-3-1 through ORG-3-79, the Draft EIR includes sufficient information and analysis regarding the Project's potentially significant impacts to air quality, biological resources, groundwater resources, soil contamination, and visual resources at the Project site. Moreover, there is no significant new information requiring recirculation. (See CEQA Guidelines Section 15088.5.)

Attachment A (ORG-3A):

Response ORG-3A-1:

Commenter introduces the comment letter pertaining to Project and commenter's review of the Draft EIR, and states that subsequent comments pertain to environmental safety, visual quality, and utility services. This comment does not state a specific concern or question regarding the adequacy of the analysis contained in the Draft EIR. Therefore, a response is not required pursuant to CEQA. However, the comment is acknowledged for the record and will be forwarded to the decision-making bodies for their review and consideration.

Response ORG-3A-2:

This comment introduces subsequent comments, and explains several purposes of Phase I Environmental Site Assessments. The comment also presents selected excerpts from the Draft EIR upon which subsequent comments are based. The excerpted Draft EIR text appearing in the comment contains notable omissions, where the Draft EIR Section 5.15.3.2.3 also identifies that the Phase I ESAs performed for the facility site indicate the potential exists for contaminated soils due to past uses on the site, including pesticides as a result of agricultural activities. As a result of the historical agricultural activities and associated pesticide use, and other uses on the site that could result in hazardous materials contamination (as identified in Draft EIR Section 5.15.3.2.3), the Draft EIR identifies Mitigation Measure 5.15-1 (Additional Assessment, and Possibly Remediation of Potentially Contaminated Soils on the Project Site), which is applicable to the entire Project site. Additionally, Draft EIR Section 5.15, Mitigation Measure 5.15-3 (Impacts from Abandoned Oil Well) includes measures that would reduce potential impacts associated with the abandoned oil well to levels below significance.

Response ORG-3A-3:

The comment states that the Draft EIR fails to disclose the environmental conditions described in the Phase I ESAs. On the contrary, the Draft EIR Section 5.15.3.2.3 identifies the potential for contaminated soils due to past uses on the site, including pesticides as a result of agricultural uses, and Section 5.15.5 identifies mitigation, including sampling and possible remediation to address the potential soil contamination. Refer to Response ORG-3-49 for more information.

Response ORG-3A-4:

Refer to response ORG-3-49.

Response ORG-3A-5:

The comment states that the 2008 Phase I ESA recommended a Phase II ESA to be performed on the property. The comment also states that the Phase II, which involves collection of samples, was recommended to address the stained soil near four aboveground fuel tanks, hazardous materials and potential waste disposal at the ranch property, and an on-site abandoned oil well. The Draft EIR identifies Mitigation Measure 5.15-1 (Additional Assessment, and Possibly Remediation of Potentially Contaminated Soils on the Project Site), which requires that a Phase II ESA be performed, and that assessed contaminated soils are remediated in accordance to remediation goals and cleanup criteria (i.e., performance standards, as allowable under CEQA Guidelines Section 15126.4) approved by the CUPA. The mitigation measure addresses the entire Project site, and not only the areas stated in the comment. Additionally, Draft EIR Section 5.15, Mitigation Measure 5.15-3 (Impacts from Abandoned Oil Well) includes measures to ensure proper well abandonment in accordance with DOGGR standards that would reduce potential impacts associated with the abandoned oil well to levels below significance.

Response ORG-3A-6:

Refer to Responses ORG-3-69 and ORG-3-70. Currently, as the Project overlies the Antelope Valley Groundwater Basin, the Applicant has an overlying right to use groundwater from the Basin for the proposed Project. The Draft EIR concludes that there is adequate groundwater supply in the Project area within the western portion of the Basin to meet the Project's water use based on historic groundwater contour data, well records in the Project area, and a well investigation/pump test performed on an on-site groundwater well. In addition, according to the Antelope Valley Integrated Regional Water Management Plan, groundwater is considered a reliable water source in the Antelope Valley Groundwater Basin. The Antelope Valley Groundwater Basin is in Adjudication. As an overlying owner with historic usage, the Applicant may assert defenses to claims of prescription and may secure a correlative right to

groundwater as an overlyer in an amount sufficient to supply the Project. The Project's water usage would be a significant reduction from the amount of groundwater reasonably estimated to be allocated to the Project site, and would not likely exceed the Project's correlative share of the native safe yield. Consistent with CEQA's informational purposes and the need to address the long-term reliability of the proposed water supply, Draft EIR Section 5.14.3.2.1 also considers whether the Project's water use would be a significant reduction from the amount of water estimated to be allocated to the Project site as its share of the safe yield for the Antelope Valley Groundwater Basin to be determined by the Court in the Adjudication. The Draft EIR concludes that because the Project's groundwater usage would be consistent with the amount of groundwater reasonably estimated to be allocated to the Project site, the Project would not result in a significant impact related to water supply. Consistent with CEQA, Draft EIR Section 5.14.3.2.1 further acknowledges the degree of uncertainty involved and "discusses the reasonably foreseeable alternatives." (See *Vineyard Area Citizens for Responsible Growth*, 40 Cal.4th at 432, 434) ("where, despite a full discussion, it is impossible to confidently determine that anticipated future water sources will be available, CEQA requires some discussion of possible replacement sources or alternatives to use of the anticipated water, and the environmental consequences of these contingencies.").) These alternatives include seeking transferable groundwater rights from a landowner and/or public water supplier or payment of an assessment to the Watermaster. Since such water would be within the total sustainable yield for groundwater pumping established for the Basin in the Adjudication, no significant impact would occur. The Draft EIR also discloses the significant foreseeable environmental effects of purchasing and trucking fresh and/or reclaimed water from sources in the general Palmdale/Lancaster area including wholesalers, retailers, or recycled water suppliers. Based on the air and traffic analysis conducted for the Project, the Draft EIR concludes that the level of truck traffic to truck water would not present a significant impact.

Response ORG-3A-7:

Comment noted. As discussed on Response ORG-3A-6, consistent with CEQA, Draft EIR Section 5.14.3.2.1 acknowledges the degree of uncertainty involved and "discusses the reasonably foreseeable alternatives." (See *Vineyard Area Citizens for Responsible Growth*, 40 Cal.4th at 434.) These alternatives include obtaining groundwater through payment of an assessment to the Watermaster.

Response ORG-3A-8:

Refer to Responses ORG-3-45, ORG-3-48, and ORG-3-77. USGS 2003 documents land subsidence in Antelope Valley. It discusses that despite extensive agricultural pumpage from 1930-1992 in the Project area, there has been no land subsidence in the 60 square mile area surrounding the Project site. (see USGS 2003, Figure 8). The 292 square miles of Antelope

Valley that has had more than 1 foot of subsidence is located about 7 miles to the east of the Project area. The water-level hydrograph for the USGS monitoring well site (Draft EIR Appendix J, Figure 5) located about 0.5 mile northeast of the Project site shows that water levels have generally risen in the Project area since the 1960s and appear to have stabilized since 1988 in the area surrounding the Project site. This water level rise occurred despite the fact that water levels have declined as much as 400 feet and exhibited more than 6 feet of subsidence in the area underlain by lacustrine deposits located more than 7 miles east of the monitoring well and the Project site. See Responses ORG-3-71 for more information.

Response ORG-3A-9:

As discussed in Response ORG-3-40, CEQA Guidelines section 15125(a) provides that "An EIR must include a description of the physical environmental conditions in the vicinity of the project, as they exist at the time the notice of preparation is published…."). As discussed in Draft EIR Section 5.14.2.1.2, the groundwater use as of the date of the NOP is approximately 1 AFY. Based on a review of well records in the Project area, as well as groundwater contour data from Durbin (1978) and RWMG (2007), groundwater levels at the Project site appear to have remained steady from 1915 to 1961 and have been stable or increasing since 1961. As discussed on Draft EIR Section 5.14.3.2.1, based on that information the Draft EIR concludes that there is not a significant impact under CEQA because there is adequate groundwater supply in the Project area within the western portion of the Basin to meet the Project's water use, and such use will not exceed the Project's correlative share of the native safe yield, based on historic groundwater contour data, well records in the Project area, and a well investigation/pump test performed on an on-site groundwater well. In addition, according to the Antelope Valley Integrated Regional Water Management Plan, groundwater is considered a reliable water source in the Antelope Valley Groundwater Basin. In addition, as discussed in Draft EIR Section 5.14.3.2.1, the Project's water demand comprises only 0.18 percent of the Antelope Valley Groundwater Basin's safe yield during construction, and 0.01 percent during operation.

Response ORG-3A-10:

Refer to Responses ORG-3-45, ORG-3-48, ORG-3-77, and ORG-3A-8 for discussion of land subsidence concerns for the Antelope Valley Groundwater Basin. There has been no land subsidence at the Project site or within the 60 square miles surrounding the Project site (USGS 2003, Figure 8). As discussed in Draft EIR Appendix J, conditions that could cause land subsidence (see USGS 2003) from groundwater withdrawal such as thick compressible clay layers and significant water level declines below the clay are not conditions that exist at the proposed Project site. Land subsidence in the Antelope Valley Groundwater Basin has primarily occurred in the eastern portion of the Antelope Valley Groundwater Basin in areas of thick lacustrine deposits and compressible clay layers, creating a two-layer aquifer system

that has experienced land subsidence. Land subsidence is not evidenced until approximately 7 miles east of the Project site, and the area of greatest land subsidence in the deeper aquifer, directly below Lancaster, is located approximately 20 miles east of the Project site. USGS monitoring well 8N/14W-18N1 is located between the Project site and the area of measured land subsidence. This monitoring well has measured rising and stable water levels since the late 1960s, a condition contrary to land subsidence. Accordingly, land subsidence is not considered to be a potential Project effect.

Response ORG-3A-11:

This comment is not relevant to the adequacy of the Draft EIR; thus, no response is required.

Response ORG-3A-12:

The comment erroneously states that no documentation on how the post-construction KOP simulations were created were provided in the Draft EIR. The Draft EIR presents a detailed description of the simulation preparation in Section 5.10.3.4.2, which includes: a description of the equipment used (Fuji GX 617 panoramic camera providing a 2.25-inch by 6-inch film transparency, Nikon 12-megapixel digital camera with a 35-mm lens image, hand-held GPS unit, and various computer software [terrain model, computer-aided design, rendering software, etc.]); the steps and procedures followed to generate the simulations; and the methodology and purpose of the procedures. Section 5.10.3.4.2 of the Draft EIR also described methods employed to produce visual accuracy (for instance, use of a terrain model to align the Project computer model to the photographs, use of computer aided design (CAD) for life-sized modeling, use of global positioning systems [with coordinates depicted on Draft EIR Figure 5.10-1B] to accurately georeference facility equipment locations, color mapping and texturing of all modeled elements to simulate actual facility materials, simulating the lighting conditions at the time the photographs were taken. etc.). In summary, the Draft EIR provides documentation on the simulation preparation that provides an adequate level of detail to address the accuracy and suitability of the simulations.

Response ORG-3A-13:

Draft EIR Section 5.10 (Visual Qualities) presents two KOPs from SR-138: KOP 1, perspective facing west; and KOP 2, perspective facing north at 170th Street West. KOP 1 (looking west) was selected because the predominant public viewing perspective from SR-138 along that segment would be from a motorist traveling along SR-138. No public turnouts or resting locations are located along SR-138 at the Project site area where viewers are able to stop and gaze northward or southward into the privately-owned property. KOP 2 shows the view looking northward near the intersection of SR-138 and 170th Street West, and represents a feasible perspective of a motorist traveling north at the intersection, where major components of the Project are shown, including the solar array fields, operations and

maintenance building, water tank area, and 34.5 kV and 230 kV transmission lines. As a result, KOP 1 and KOP 2 presented in the Draft EIR are considered adequate in representing the feasible views of the facility from the available public viewing locations.

Response ORG-3A-14:

Refer to response ORG-3-52.

Response ORG-3A-15:

The commenter has attached a résumé, which does not relate to the adequacy of the Draft EIR. No response is required.

Attachment B (ORG-3B):

Response ORG-3B-1:

The comment is introductory in nature, and does not address the content or adequacy of the Draft EIR. No response is required.

Response ORG-3B-2:

Refer to response ORG-3-34.

Response ORG-3B-3:

Baseline data for the transmission lines are discussed throughout Draft EIR Section 5.7.3 (Project Impacts), in subsections titled "Off-site Transmission Line." As discussed in Draft EIR Sections 5.7.2.2.1 through 5.7.2.2.5, studies were conducted for the transmission line route, including portions of the route in Kern County, in January through June, 2009. Additional biological surveys of the expanded study area of the transmission line route in Kern County were conducted in January 2010. Biological studies discussed in Sections 5.7.2.2.1 through 5.7.2.2.5 addressed vegetation communities, jurisdictional waters and streams, plants, and wildlife. These sections provide additional information relating specifically to special-status species and wildlife movement. Biological studies for the proposed Whirlwind Substation were performed by Southern California Edison, as discussed in Section 5.7.2 of the Draft EIR. For baseline biological conditions at the Whirlwind Substation project area, where access was restricted, the Draft EIR refers to the Biological Resources Specialist Report for the TRTP EIR/EIS (Aspen 2009). The proposed locations of access pathways are shown on Figures 4.3-4A and 4.3-4B, as well as 5.7-8A and 5.7-8B, of the Draft EIR. These pathways are described in Section 4.4.6.7.6 of the Draft EIR. As mentioned in Section 5.7.16 of the Draft EIR, these pathways would only occur in non-natural habitats, under baseline conditions.

As described in Draft EIR Appendix E, biological field surveys of the transmission line route were conducted on February 3; March 26; April 8, 22, 23, and 30; May 1 and 8; and June 9, and 10, 2009. The surveys conducted were similar in scope and intensity to those undertaken within the Project site, and included vegetation mapping, general wildlife surveys, focused floristic surveys, protocol surveys for the burrowing owl, Joshua tree mapping, nesting bird surveys, and jurisdictional drainages (Draft EIR Appendix E, Table 4-1). In addition, biological surveys of the expanded study area surrounding the proposed transmission line route in Kern County were conducted in January 2010.

No surveys were performed within the Whirlwind Substation site, as that facility is not a component of the proposed Project. The Whirlwind Substation is part of the SCE Tehachapi Renewables Transmission Project (TRTP), and has been previously evaluated under CEQA through an EIR prepared by the California Public Utilities Commission. For baseline biological conditions in the vicinity of the Whirlwind Substation, where access was restricted, the Draft EIR refers to the Biological Resources Specialist Report from the TRTP EIR/EIS.

As described in Section 4.4 of the Draft EIR, the proposed transmission line route would be installed partially within the right-of-way of 170th Street West, and partially on private lands in Kern County. Where transmission line poles would be constructed outside the existing road right-of-way, access would be obtained via a series of proposed construction pathways that would link the construction zones to 170th Street West (Draft EIR Section 4.4.6.7.6). The proposed locations of access pathways are shown on Figure 4.3-4 and 5.7-8 in the Draft EIR. These pathways are described in Section 4.4.6.7.6 of the Draft EIR. As mentioned in Section 5.7.3.2.1 of the Draft EIR, these pathways would only occur in non-natural habitats. Because of the route's close proximity to this existing roadway, no additional construction/ maintenance access road along the transmission line is proposed.

Response ORG-3B-4:

The comment asserts that because the biological surveys for the Project site were directed towards birds and plants, these surveys do not constitute substantial evidence regarding the presence of terrestrial vertebrae. As stated in Draft EIR Appendix E, general surveys for wildlife were incorporated into the other surveys conducted within the Project site. This practice was associated primarily with the focused botanical surveys and protocol burrowing owl surveys of the site, because these surveys required intensive, repeated, pedestrian transects of the entire site. While it is true that Phase II surveys for the burrowing owl are technically "bird surveys," these surveys do not involve "looking upwards at birds" as the commentor suggests. During the burrowing owl transect surveys, survey effort is directed at the ground in an attempt to identify small mammal burrows or other features that may be suitable for use by burrowing owls, as well as other owl signs such as pellets and white wash.

Likewise, focused botanical surveys also require careful examination of the ground in an effort to detect and identify low-growing plant species. The substantial number of full-coverage, pedestrian transect surveys conducted during the spring of 2009 were adequate to compile baseline information regarding biological resources within the site, including terrestrial vertebrates.

Response ORG-3B-5:

The comment is general in nature, and serves to introduce issues related to special-status species that are addressed in greater detail by comments that follow. Thus, no specific response to this comment can be provided. For responses addressing the Mohave ground squirrel, desert tortoise, Blainville's horned lizard, special-status plants, and burrowing owl, please refer to Responses ORG-3B-6, ORG-3B-7, ORG-3B-8, ORG-3B-9, and ORG-3B-12, respectively.

Response ORG-3B-6:

No trapping for the Mohave ground squirrel was done because the site is outside the species' known range, according to the most current information. The Laabs (2004) Mohave ground squirrel account cited in the Biota Report (Draft EIR Appendix E) is supported by information published by Leitner (2008) on the current and historic distribution of this species. Assembling a comprehensive database of occurrences of the Mohave ground squirrel, Leitner showed its historic range as ending more than 10 miles east of the site. Trapping grids east of SR-138 yielded no occurrences of this species between 1998 and 2007, according to Leitner. Similarly, the California Natural Diversity Database, maintained by CDFG, includes no records for this species within 13 miles of the site.

Response ORG-3B-7:

The June 16 and July 9, 2009 communications from USFWS do not constitute a reversal of this agency's opinion on the likelihood of desert tortoise occurring on-site, and the latter communication does not express the opinion that tortoises might occur at the AVSR1 site. The June 16, 2009 letter from Carl T. Benz, Assistant Field Supervisor for the Ventura Office of USFWS (see Draft EIR Appendix A.2. Notice of Preparation Response Letters), tentatively recommends that "areas that would be affected by construction and operation of the solar plant and transmission line" be surveyed for desert tortoise. However, the letter goes on to say that "if a Federal agency has discretionary regulatory authority over the proposed action, it would be required to consult with the Service under authorities of Section 7(a)(2) of the Endangered Species Act; if, as a result of the consultation, the Service determines the proposed action is not likely to jeopardize the continued existence of the desert tortoise, the project proponent would be exempted from the prohibition against take contained in section 9 of the Endangered Species Act. If desert tortoises occur in the project area and may be

taken during project activities, the project proponent should contact the Service to determine the appropriate course of action." Therefore, the NOP response of USFWS left open the possibility that tortoise surveys would not be necessary. URS biologist Crissy Slaughter followed up on this question with USFWS biologist Ray Bransfield. Ms. Slaughter had seven years of desert tortoise survey experience prior to working on the Project site, including experience as a USFWS-approved tortoise handler and as a field supervisor for tortoise surveys of a 14-square-mile site in Johnson Valley, California. Based on a habitat description by Ms. Slaughter, and descriptions of the extensive biological surveys that had been done on the site (including Phase II burrowing owl surveys, which involved straight-line transect surveys of the entire site, focused on searching for owl burrows and owls), Mr. Bransfield determined that tortoises were unlikely to occur in the area, and that tortoise surveys would not be necessary. (See Mr. Bransfield's email response in Appendix A.3 Agency Coordination regarding Notice of Preparation Response.) Therefore, the Applicant's decision not to perform desert tortoise surveys was made in consultation with USFWS, according to procedures outlined in that agency's original response to the NOP. USFWS agreed that no impacts would occur to desert tortoises. Bransfield's recommendation that an "avoidance strategy" be implemented was based only on "the unlikely event" that tortoises might occur in "relatively small patches of native habitat" along the transmission line route.

Despite the very low probability for the desert tortoise to be affected by the Project, Mitigation Measure 5.7-13 has been added in the Draft EIR to require pre-construction surveys for this species (see Section 2.0, Revisions to the Draft EIR in this Final EIR).

Response ORG-3B-8:

Federal and state resource agencies have not published a formal survey protocol for the Blainville's horned lizard. As described in Draft EIR Section 5.7.2.1.4, general wildlife surveys conducted for the proposed Project detected only a single Blainville's horned lizard within the Project site. The site is located to the north of this species' published geographic range, and the observed individual was located in the southeastern corner of the site, closest to the species' known range. Based on this information, the Draft EIR concluded that the detected individual was most likely dispersing, and that this species is probably very uncommon on-site, especially north of SR-138 (Draft EIR Appendix E, Section 4.10.1.1.1). Thus, the 550 acres of prescribed mitigation acreage (100 acres within the Project site and an additional 450 acres off-site) did not assume presence of only a single lizard, but rather accounted for the possibility that this species is an uncommon but present resident of the southern portion of the site. In addition to the mitigation lands set aside through Mitigation Measures 5.7-1 and 5.7-2 (as modified; see Section 2.0, Revisions to the Draft EIR in this Final EIR), impacts to this species would also be reduced through the capture and relocation efforts required by Mitigation Measure 5.7-7 (as modified; see Section 2.0, Revisions to the Draft EIR in this Final EIR).

Response ORG-3B-9:

While less than average rainfall may lessen the chance of finding some species, the 2000 edition of CDFG's Guidelines for Assessing the Effects of Proposed Projects on Rare, Threatened, and Endangered Plants and Natural Communities, cited by the commentor, does not require that botanical surveys be conducted in years of average to above average rainfall, and in fact does not mention precipitation levels in any context. As surveys met all CDFG criteria, there is no reason to believe they should be invalidated. Some suitable habitat was found for several rare and special-status plants on the site, including the majority of those mentioned in the comment. However, none of these species was found on the site.

Response ORG-3B-10:

Figure 5.10-5 is a simulated view of the site from SR-138 after implementation of project landscaping, not a representation of actual native Mojave habitat adjacent to the site. However, as noted throughout Draft EIR Section 5.7, native habitats are present and will remain in the project vicinity after development. The comment contends that roads are not barriers to dispersal between these areas, "as attested to [in] frequent observations of all categories of wildlife on highways." Draft EIR Section 5.7.3.2.6 and the Biota Report (Section 5.6) acknowledge that wildlife moves within and through the site. With respect to roadways, the Biota Report states only that the movement of terrestrial wildlife is "somewhat constrained" by roadways. An extensive study by South Coast Wildlands (2008) did not identify the project site as within a large-scale habitat linkage, as larger wildlife prefer to travel along the margins of the valley, not across the valley floor. The Project would not pose a barrier to movement of medium-size and small terrestrial wildlife, as wildlife permeable fencing would still permit these species to move freely through the site. The Project may pose a partial barrier to plant dispersal; however, preservation of on-site habitat surrounding Drainages A and C and the provision of a minimum of 450 acres of off-site mitigation in Mitigation Measure 5.7-2 (as modified; see Section 2.0, Revisions to the Draft EIR in this Final EIR) would benefit native plant dispersal in the region.

Response ORG-3B-11:

Refer to Response ORG-3-63.

Response ORG-3B-12:

Refer to Response ORG-3-39.

Response ORG-3B-13:

Although some of the biological field survey personnel possessed college degrees in subjects not explicitly pertaining to desert biota (two of the field biologists possessed aquatic biology degrees, and one possessed an advanced degree in history), the resumes of the personnel, included in Appendix E to the Draft EIR, clearly demonstrate substantial previous experience and knowledge of desert flora and fauna. Each of the surveyors in question had a minimum of eight years' full-time, post-graduate professional experience in biology.

As described in Section 5.7 and Appendix E to the Draft EIR, the desert tortoise and Mohave ground squirrel are highly unlikely to occur within the Project site due to documented geographic ranges for these species and lack of suitable habitat on-site. For additional responses addressing the desert tortoise and Mohave ground squirrel, please refer to Responses ORG-3B-7 and ORG-3B-6, respectively.

No focused surveys for common wildlife, such as pocket mice and white-tailed mice, were performed, as the likely on-site representatives from these groups lack sensitivity designations. The special-status plant and wildlife surveys were performed by qualified professionals in accordance with accepted protocols, and represent an accurate assessment of baseline conditions with regard to sensitive biological resources.

Although the vast majority of species detected within the Project site and along the proposed transmission line route were identified to the species level, there were a few instances in which this was not possible, either because the species were detected by sign only, or because the detected individuals were birds observed at too great a distance or in view too briefly to make a species-level identification. As described on page 4-69 of the Biota Report in Appendix E to the Draft EIR, the presence of kangaroo rats on-site was determined by the presence of the distinctive tracks left by these species. The hummingbird and flycatcher were observed from a distance and for only a short period during bird surveys, and could not be identified to the species level. Based on a query of the CNDDB, presented in Appendix G to the Biota Report, no sensitive species of kangaroo rat, hummingbird, or flycatcher have been documented in the Project vicinity.

Response ORG-3B-14:

The comment asserts that the Draft EIR fails to adequately evaluate the Project's effects on state jurisdictional waters, because the use of a 100-foot buffer is not justified and because construction impacts, such as inadvertent dumping of toxic materials, were not evaluated. A 100-foot buffer surrounding Drainage A was determined to be appropriate based on the nature of the site, the ephemeral flow regime within the drainage and the proposed surrounding uses. Because the site is topographically simple, and lacks well-defined drainage patterns, the opportunity for upstream activities to affect the stream is low. Also, because the

proposed land use within the Project site is largely passive, and would not involve substantial levels of activity once constructed, chances for impacts to occur would be further minimized. Workers or equipment would be highly unlikely to attempt to "shortcut" through the site's drainages, because the drainages feature incised channels with steep banks. The Draft EIR specifically analyzes and addresses potential impacts due to hazardous materials use and storage during construction and operation in Section 5.15.3.2.1. The analysis identifies required implementation of a facility hazardous materials and hazardous waste management program for both construction and operation phases, proper transport of hazardous materials, fueling and maintenance procedures, and emergency response plan and procedures (refer to Draft EIR Section 5.15.3.2.1). Additionally, the Draft EIR addresses and mitigates the potential for dumping of other contaminants into on-site drainages with implementation of Mitigation Measure 5.3-1 (Erosion Control and Stormwater Management Measures), Mitigation Measure 5.5-1 (On-Site Wastewater Treatment System Feasibility Report), Mitigation Measure 5.7-5 (Biological Monitor), and Mitigation Measure 5.7-6 (Worker Environmental Awareness Program). Further, due to the low-gradient nature of the Project site, the potential for any spilled materials to traverse the 100-foot buffer and make their way into on-site drainage channels is remote. Also, because the drainage does not exhibit surface flows during most of the year, there would likely be opportunities for any spilled substance to be cleaned up prior to rain events.

Response ORG-3B-15:

As mentioned in Draft EIR Section 5.7.3.2.5, discussing impacts to Blainville's horned lizards, burrowing owls, and other special-status bird species, the Project would result in new perching opportunities for common ravens within the site boundaries. However, existing vegetation that would be removed due to project development (ornamental trees, native and ornamental shrubs) already provides ample perching opportunities for this species, which is common on the site and in the Antelope Valley in general. Power poles along SR-138 also provide perches and nesting sites for this species. Raven perching around the site perimeter, in particular, would have the potential to impact native wildlife, as these areas would be closest to the undisturbed natural habitats surrounding the site. However, slack wire to be incorporated on these fences would deter raven perching. The project would not provide new drinking sites from landscape irrigation, as drip irrigation would be employed in the landscaped areas (all along SR-138), and no standing water would result. The off-site transmission line would use a design that would not encourage nesting by ravens. Wooden, on-site transmission lines may provide some nesting opportunities for ravens, but these would be located within the site and away from the undisturbed and more sensitive habitats at the site perimeter.

Response ORG-3B-16:

As discussed in the Draft EIR, implementation of the proposed Project would result in a significant impact to on-site habitats in the majority of the site. This impact would be mitigated through the avoidance and enhancement of approximately 100 acres of on-site habitat, as well as through the acquisition and preservation of approximately 450 acres of off-site habitat in perpetuity. Within these areas, Mitigation Measures 5.7-1 and 5.7-2 (as modified; see Section 2.0, Revisions to the Draft EIR in this Final EIR) would require that coverage by invasive weeds be limited and maintained. In addition, requirements that herbicide use would require approval by LACDRP and would be applied by qualified personnel (Mitigation Measure 5.7-1) would limit unintentional effects of inappropriate herbicide use.

Response ORG-3B-17:

The comment asserts that mitigation proposed in the Draft EIR fails to reduce and avoid impacts to jurisdictional drainages, and recommends that a buffer of 300 feet from the centerline of all ephemeral drainages be implemented. A 100-foot buffer surrounding Drainage A was determined to be appropriate based on the nature of the site, the ephemeral flow regime within the drainage and the proposed surrounding uses. Because the site is topographically simple, and lacks well-defined drainage patterns, the opportunity for upstream activities to affect the stream is low. Also, because the proposed land use within the Project site is largely passive, and would not involve substantial levels of activity once constructed, chances for impacts to occur would be further minimized. Construction-related impacts, such as the potential for inadvertent dumping into on-site drainages, would be reduced by some of the measures identified in the Draft EIR, such as implementation of a Worker Environmental Awareness Program (Mitigation Measure 5.7-6) and the requirement to have a biologist on-site (Mitigation Measure 5.7-5).

Response ORG-3B-18:

The comment asserts that the single biological monitor required by Mitigation Measure 5.7-5 would be insufficient, and that two to three monitors should be provided. As illustrated in the construction schedule on Figure 4-13 in Draft EIR Section 4.0, construction within the entire site would not occur simultaneously. Rather, the various discrete site segments would be developed over time, with only a fraction of the site under construction at any given time. This schedule would reduce the workload of the biological monitor substantially, such that a single monitor may be capable of performing the duties set forth in Mitigation Measure 5.7-5. Measure 5.7-5 uses the term Biological Monitor as a job responsibility and does not limit the position to one person. Because the Applicant would be bound by the requirement to

have a biological monitor(s) present during all initial grading, multiple qualified monitors would be utilized, as necessary, depending on the pace of construction activities.

Response ORG-3B-19:

As required by Draft EIR Mitigation Measure 5.7-5, the biological monitor would be retained by the Applicant, but the biologist selected would require approval by the County.

With respect to the need for a Drainage Maintenance Plan, it is expected that the materials covered in the Worker Environmental Awareness Program required by Draft EIR Mitigation Measure 5.7-6 would include avoidance of drainage channels among the mitigation requirements discussed, and that this training, combined with the presence of an on-site biological monitor, would be sufficient to discourage unauthorized entry into drainage areas.

Response ORG-3B-20:

Refer to Response ORG-3-76.

Response ORG-3B-21:

Refer to Response ORG-3-77.

Response ORG-3B-22:

As required by Draft EIR Mitigation Measure 5.10-4, the landscaping plan for the 10-foot-wide strip of Project screening vegetation proposed along SR-138 would require approval from the County, and would be certified by a registered landscape architect. Although the measure does not specify which species would be planted, the measure does specify that Joshua trees and/or other species of the genus *Yucca* be used, requires that the species employed be native, and requires compliance with the County's Drought-Tolerant Landscaping Ordinance. Because this measure is intended to mitigate visual impacts, the precise species composition is not yet known, and will be determined based on the need to shield specific Project elements from view and create a pleasing visual experience from SR-138. The measure's requirement to landscape the areas with native species and to control weeds would prevent biological impacts from being generated by this measure.

Response ORG-3B-23:

The comment contains closing remarks, and does not address the content or adequacy of the Draft EIR. No response is required.

Response ORG-3B-24:

The comment contains the commentor's curriculum vitae, and does not address the content or adequacy of the Draft EIR. No response is required.

Response ORG-3B-25:

The comment contains a poor reproduction of a map intended to demonstrate the geographic limits of the Mohave ground squirrel's year-round range, and contains no accompanying text. As no comment on the content or adequacy of the Draft EIR is made by this exhibit, no response is required; however, Response ORG-3B-6 pertains to this species.

Response ORG-3C:

Attachment C is an article titled: "How Much Water Does Alfalfa Really Need" (Hanon et al. undated). This attachment is a reference and no response is required.

Response ORG-3D:

Attachment D is a report titled: "Paradise Regained – Solutions for Restoring Yosemite's Hetch Hetchy Valley" (Rosenkrans et al. 2004). This attachment is a reference and no response is required.

Response ORG-3E:

Attachment E is the minutes of the Significant Ecological Area Technical Advisory Committee (SEATAC) meeting of May 11, 2009. This attachment is a reference and no response is required.

Response ORG-3F:

Attachment F is an article titled: Pistachios (Irrigation Management for Pistachio Trees under Drought Conditions)(The Regents of the University of California 2008). This attachment is a reference and no response is required.

Response ORG-3G:

Attachment G is a report titled: Simulation of Ground-water Flow and Land Subsidence, Antelope Valley Ground-water Basin, California (USGS 2003). This attachment is a reference and no response is required.

Response ORG-3H:

Attachment H is an email from Imsand, Shirley to SPHarris dated January 13, 2009. This attachment is a reference and no response is required.

Response ORG-3I:

Attachment I is the U.S. Department of Energy, Office of Health, Safety and Security-Safety Advisory regarding Valley Fever (coccidiodomycosis) dated January 2007. This attachment is a reference and no response is required.

Response ORG-3J:

Attachment J is a Material Safety Data Sheet (MSDS) for ROUNDUP ORIGINAL Herbicide, dated 1998. This attachment is a reference and no response is required.

References:

California Burrowing Owl Consortium (CBOC). 1993. Burrowing owl survey protocol and mitigation guidelines.

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Kiff, L.F., and D. Irwin. 1987. The breeding seasons of Los Angeles County birds. Western Tanager 53(7):4-5.

Leitner, Philip. 2008. Current Status of the Mohave Ground Squirrel. Transactions of the Western Section of the Wildlife Society 44:11-29

ORG-3

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July 30, 2010

By Email and U.S. Mail

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Re: Comments on Draft Environmental Impact Report for the AV Solar Ranch One Project

Dear Ms. Tran:

We are writing on behalf of California Unions for Reliable Energy ("CURE") to comment on the Draft Environmental Impact Report ("DEIR") prepared by the Los Angeles County Department of Regional Planning ("DRP") for the 230 MW AV Solar Ranch One Project ("Project") proposed by AV Solar Ranch 1, LLC ("Applicant"). After carefully reviewing the DEIR and the supporting documentation available to us, we conclude that DRP has failed to adequately identify, analyze, and mitigate the Project's potentially significant effects to air quality, biological resources, and soil and water. Due to these deficiencies, among others which are fully detailed in our comments, the DEIR must be revised to adequately address all Project impacts. The revised DEIR must be recirculated for public review and comment in accordance with the California Environmental Quality Act ("CEQA"). ORG-3-1 -2

The Project requires a vesting tentative tract map and a conditional use permit from DRP to authorize Project construction, operation and maintenance. The Project will also require permits from the Lahontan Regional Water Quality Control Board ("Water Board") and the Antelope Valley Air Quality Management -3

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District ("Air District"). The Project will require encroachment permits from the County for the placement of electrical transmission line poles in County road rights of ways, and an encroachment permit from Kern County for transmission line crossings and linear encroachments along 170th Street West. Although nowhere identified in the EIR, the Project also requires a streambed alteration agreement, pursuant to section 1602 of the California Fish and Game Code. -3 -4

I. INTRODUCTION

CURE is a coalition of unions whose members help solve California's energy problems by building, maintaining, and operating conventional and renewable energy power plants. Poorly designed renewable energy power plants may degrade the environment by destroying historic resources and wildlife habitat areas, causing noise and visual intrusion, and polluting water and soil. Union members live in and around this community and have a direct interest in protecting the biological resources in and around the Project site and the groundwater and air resources in Antelope Valley. Union members also have a direct interest in ensuring a safe workplace for workers during Project construction. -5

Our comments on the DEIR were prepared with the assistance of technical experts, Matthew Hagemann, P.G. and Jim Cornett M.S. The comments of Mr. Hagemann and Mr. Cornett along with their *curriculum vitae*, are provided herein as Attachment A and B, respectively. Please note that the comments by Mr. Hagemann and Mr. Cornett are in addition to the issues addressed below and, thus, should be evaluated and responded to separately. -6

The DEIR fails to adequately analyze potentially significant Project impacts in several critical resource areas, including air quality, biological resources, visual resources, and water quality, and fails to propose adequate mitigation for the significant impacts that it does identify. The DEIR also fails to present a stable and finite Project description and fails to include an adequate Water Supply Assessment ("WSA"), as required by Sections 10910 and 19012 of the California Water Code. These defects, as well as numerous additional analytical deficiencies described in our comments, render the DEIR invalid as an environmental review document under CEQA. Because significant new information must be added to the DEIR to -7 -8 -9 -10

remedy these deficiencies, the revised DEIR must be recirculated for public review and comment.[1] -10

II. THE DEIR FAILS TO SATISFY CEQA'S PURPOSE AND GOALS

CEQA has two basic purposes, neither of which the DEIR satisfies. First, CEQA is designed to inform decision makers and the public about the potential, significant environmental effects of a project.[2] CEQA requires that an agency analyze potentially significant environmental impacts in an EIR.[3] The EIR should not rely on scientifically outdated information to assess the significance of impacts, and should result from "extensive research and information gathering" including consultation with state and federal agencies, local officials, and the interested public.[4] To be adequate, the EIR should evidence the lead agency's good faith effort at full disclosure.[5] Its purpose is to inform the public and responsible officials of the environmental consequences of their decisions *before* they are made. For this reason, the EIR has been described as "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.[6] Thus, the EIR protects not only the environment but also informed self-government."[7] -11

Second, CEQA directs public agencies to avoid or reduce environmental damage when possible by requiring alternatives or mitigation measures.[8] The EIR serves to provide public agencies, and the public in general, with information about the effect that a proposed project is likely to have on the environment and to "identify ways that environmental damage can be avoided or significantly reduced."[9] If a project has a significant effect on the environment, the agency may approve the project only upon a finding that it has "eliminated or substantially

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[1] *See Cadiz Land Co., Inc. v. Rail Cycle, L.P.* (2000) 83 Cal.App.4th 74, 91.

[2] Cal. Code Regs., tit. 14, § 15002, subd. (a)(1) (hereafter "CEQA Guidelines").

[3] See Pub. Resources Code, § 21000; CEQA Guidelines § 15002.

[4] *Berkeley Keep Jets Over the Bay Comm. v. Board of Port Comm.* (2001) 91 Cal. App.4th 1344, 1367 and *Schaeffer Land Trust v. San Jose City Council*, 215 Cap.App.3d 612, 620.

[5] CEQA Guidelines § 15151; *see also Laurel Heights I* (1998) 47 Cal.3d 376, 406.

[6] *County of Inyo v. Yorty* (1973) 32 Cal.App.3d 795, 810.

[7] *Citizens of Goleta Valley v. Bd. of Supervisors* (1990) 52 Cal.3d 553, 564 (citations omitted).

[8] CEQA Guidelines § 15002(a)(2)-(3); *Berkeley Keep Jets Over the Bay Com.*, 91 Cal.App.4th at 1354.

[9] CEQA Guidelines § 15002(a)(2).

lessened all significant effects on the environment where feasible," and that any unavoidable significant effects on the environment are "acceptable due to overriding concerns" specified in CEQA section 21081.[10] -11

The DEIR fails to satisfy the basic purposes of CEQA. Specifically, the DEIR fails to reflect a good faith effort on the part of DRP to perform an independent investigation by failing to adequately identify the Proposed project, failing to set forth a complete and sufficiently detailed biological baseline and failing to examine Project impacts to the federally threatened desert tortoise, the state threatened Mojave Ground squirrel, and numerous other special status plants and wildlife. -12 The DEIR also fails to provide an accurate description of the existing environment upon which to measure impacts in several resource areas. The failure to accurately describe the existing environment is compounded by other errors and missing analyses in the DEIR with respect to significant impacts to groundwater resources -13 within the Antelope Valley Groundwater Basins, air quality, and public health from the increased risk of public exposure to Valley Fever as a result of the Project. -14 The DEIR also fails to disclose the soil contamination extant on the Project site. Lastly, the DEIR fails to include and show with the required degree of certainty that groundwater resources exist to meet Project demand, as required by Water Code section 10910 and 10912. -15

With respect to mitigation, the DEIR fails to identify adequate feasible mitigation for significant impacts to biological resources, state jurisdictional waters, and public health from the risk of worker exposure to Valley Fever during Project construction. -16

The DEIR's confusing description of the Project, lack of information on the environmental baseline, reasonably foreseeable Project impacts, inadequate WSA, and lack of feasible measures necessary to mitigate significant impacts fails to inform decision makers and the public of the Project's potentially significant environmental effects and how those impacts will be mitigated. The public cannot evaluate and comment on the Project and its potentially significant impacts, based -17 on the vastly inadequate environmental analysis provided in the DEIR. In addition, because the DEIR fails to provide information regarding the Project's potentially significant impacts to groundwater resources, there is no evidence to support the DEIR's conclusion that all significant Project impacts have been mitigated. -18

[10] CEQA Guidelines § 15092, subd. (b)(2)(A)-(B).

III. PROJECT DESCRIPTION

The courts have repeatedly held that "[a]n accurate, stable and finite project description is the *sine qua non* of an informative and legally sufficient [CEQA document]."[11] A project description must be accurate and consistent throughout an environmental review document.[12] It is impossible for the public to make informed comments on a project of unknown or ever-changing proportions.

> A curtailed or distorted project description may stultify the objectives of the reporting process. Only through an accurate view of the project may affected outsiders and public decision-makers balance the proposal's benefit against its environmental costs . . . .[13]

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In this case, the DEIR fails to provide a stable and finite description of the proposed solar technology for the Project. As such, its analysis of the Project's impacts on air, soil and water resources cannot be ascertained. In addition to this fundamental flaw, the DEIR also fails to include in the Project description the Project's need for a Streamed Alteration Agreement under section 1602 of the Fish and Game Code, an access road that will be constructed along the proposed transmission line right of way, and to state how domestic water will be supplied to the O&M building during Project operations.

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A. The DEIR Fails to Identify the Proposed Project

The DEIR states, "the proposed project is to arrange PV panels, tracking units, inverters, and transformers into 1- to 3- MW blocks, that combined, will achieve the full plant capacity."[14] However, the DEIR fails to definitively state whether single-axis tilted tracker, horizontal tracker units, or fixed-tilt panels are the proposed Project.[15] The distinction is significant because each type of PV panel results in distinct, potentially significant environmental effects.

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DRP's failure to provide a stable and finite Project description severely compromised the adequacy of its analysis; portions of the DEIR are also

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[11] *County of Inyo v. City of Los Angeles* (1977) 71 Cal.App.3d 185, 193.

[12] *Id.* at 192.

[13] *Id.* at 192-193.

[14] County of Los Angeles Department of Regional Planning Impact Analysis Section, Draft Environmental Impact Report AV Solar Ranch One Project, June 2010, at p. 4-7 (hereafter "DEIR").

[15] DEIR at pp. 4-7, 2-6.

incomprehensible due to DRP's efforts to describe the contingencies of each technology. DRP's failure to settle on a stable Project description has obscured the proposed Project such that the public is unable to discern the Project under review. -23

The proposed use of different PV panel technologies amounts to not one but three different project proposals. If the Applicant employs tilted trackers, 70,000 concrete ballast foundations would need to be drilled into the Project site. The use of horizontal trackers, on the other hand, would involve the installation of 130,000 concrete piles or peers. However, if the Project involves fixed-tilt solar panels, approximately 465,000 steel piles are proposed.[16] The DEIR concludes that the fixed-tilt solar panel proposal would result in the worst case scenario with respect to construction noise, and would require mitigation to reduce the impact to less than significant.[17,18] However, the DEIR and Applicant fail to evaluate the significance of the noise impacts related to the tilted tracker and horizontal tracker proposals.[19] Thus, there is no substantial evidence to support DRP's claim that worst case scenario noise impacts have been analyzed or could be feasibly avoided. -24

The three different Project proposals would also result in disparate air quality impacts. The DEIR obscures the fact that a concrete batch plant would only be required for the tilted tracker and horizontal tracker alternatives. Without the concrete batch plant, the Project's construction emissions would be significantly reduced.[20] The DEIR does not inform the reader of this important Project alternative, nor does it clearly set forth the expected emissions for each of the three proposed technologies. -25

The DEIR's failure to settle on one proposed Project also creates significant confusion with respect to the proposed grading and excavation activities. The Project Description chapter of the DEIR provides that "the total Project grading-related balanced cut and fill is estimated to be approximately 180,000 cubic yards."[21] The DEIR then contradicts this statement with the following, convoluted analysis: -26

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[16] DEIR, Appendix I, p. 3-4; DEIR at p. 4-8.
[17] *See* DEIR, Appendix I, pp. 3-3-3-4.
[18] *See* DEIR, pp. 2-83, 5.18-8, 5.18-10-12, 5.8-22.
[19] *Id.*
[20] *See* DEIR, p. 5.6-18-19.
[21] DEIR, p. 4-26.

> [I]f drilled pier foundations are used, approximately 1/3 cubic yard[*sic*] of soil will be excavated for each pier....installation of drilled pier foundations would result in an estimated 42,500 cubic yards of excavated material for approximately 130,000 solar array support foundation holes . . . . The *worst case* combined cut and fill (grading) and excavation (non-grading related) quantity for development of the Project site is estimated at 250,000 cubic yards of soil material that would be balanced on the site.[22]

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Elsewhere the DEIR indicates that the Project proposes 179,996 cubic yards of cut, 2,000 cubic yards of which *will not be balanced.*[23] Elsewhere still, the DEIR provides 249,333 cubic yards of soil will be excavated or graded on site, 977 of which will not be balanced.[24] Other materials included in the DEIR state that "onsite grading of a maximum of 700,000 cubic yards of soil is expected."[25] The DEIR makes no effort to address these discrepancies.

From the information provided in the DEIR it is impossible to ascertain how much cut and fill is expected for each of the three proposals. Moreover, nothing in the record suggests that DRP evaluated the potentially significant effects, if any, associated with each of the three possible construction scenarios. Therefore, there is no substantial evidence to support DRP's claim that the worst case scenario soil mobilization impacts (whether 250,000 cubic yards or 700,000 cubic yards) could be feasibly avoided with the selection of one of the three solar panel technologies.

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The DEIR also fails to analyze the relative water needs of the three possible construction scenarios and the degree to which the Project can feasibly reduce its construction water demand if, for example, steel piles are used instead of concrete.[26] The DEIR and supporting materials also fail to analyze the differences in post-Project infiltration rates for each construction alternatives.[27] In short, DRP has failed to comply with CEQA's requirement that the EIR must first *identify the proposed Project* in order to then provide a reasoned analysis of the Project's effects.

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[22] DEIR, pp. 4-26-27 (emphasis added).
[23] DEIR, Fig. 4.4-12.
[24] DEIR, p. 4-46.
[25] DEIR, Appendix A, Notice of Preparation, p. 3.
[26] *Id.* at p. 4-14, p. 4-25 compare with *id.* at p. 4-26.
[27] *Id.* at p. 2-13.

B. The DEIR Fails to Identify the Project's Need for a Streambed Alteration Agreement

The DEIR's description of the Project must include "a list of related environmental review and consultation requirements mandated by federal, state, or local law, regulations, or policies.[28] Section 1602 of the California Fish and Game Code requires all entities to consult with the Department of Fish and Game ("DFG") prior to diverting, obstructing, or substantially changing the natural flow of state jurisdictional waters.[29] If DFG determines that the proposed project will substantially impact state jurisdictional waters, the project proponent must submit an application for and obtain a Streambed Alteration Agreement from DFG which will set forth the reasonable measures necessary to protect the resource. DFG's issuance of a streambed alteration agreements is considered a "project" subject to CEQA.[30]

The DEIR states that the Project site is traversed by three ephemeral streams, and the southern bank of a fourth ephemeral stream (identified as "Drainage D") is located on the Project site.[31] One of the four ephemeral streams (identified as "Drainage C") is known as Broad Canyon Creek.[32] According to the DEIR, all of the drainages delineated within the Project site convey flows in a generally west to east direction, and exhibit defined beds, banks, and channels.[33] The four ephemeral streams are subject to the jurisdiction of the California Department of Fish and Game ("DFG") pursuant to section 1600 et seq. of the California Fish and Game Code.[34] The Applicant intends to construct Arizona crossings at two points along Drainage A, and to erect a "cutoff wall" made of PVC or steel to contain the boundaries of Drainage A – which, according to the DEIR, has the potential to meander.[35] The Project will impact all four drainage channels, as clearly depicted in Figure 4.4-1A of the DEIR.[36] As such, the Applicant must submit an application for a streambed alteration agreement to DFG.

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[28] CEQA Guidelines § 15124(d).
[29] Fish & G. Code § 1602.
[30] CEQA Guidelines § 15378.
[31] DEIR, p. 3-3.
[32] *Id.*, p.4-21.
[33] *Id.*, p. 5.7-7.
[34] *Id.*
[35] DEIR, Appendix A.1, Fig. 5 "Proposed Channel Improvements."; DEIR, p. 4-23.
[36] *See id.* at pp. 4-21, 2.13-2.14 (admitting impacts to drainage features on the Project site).

As a result of DRP's failure to include the streambed alteration agreement into the description of the Project, the DEIR's treatment of Project impacts to state jurisdictional waters is highly misleading. The DEIR provides a clear, graphic illustration of the Project's impacts to state waters, identifies significant impacts to those features, and proposes mitigation.[37] However, according to the Project Description section of the DEIR, "[a]ll site drainages will be avoided *and* remain unmodified."[38] This erroneous statement is repeated throughout the DEIR.[39]

DRP's failure to identify the Project's streambed alteration agreement also violates CEQA's prohibition on piecemealed environmental review. In performing its analysis, a lead agency must not "piecemeal" or "segment" a project by splitting it into two or more segments. This approach ensures "that environmental considerations do not become submerged by chopping a large project into many little ones, each with a potential impact on the environment, which cumulatively may have disastrous consequences."[40] In *Laurel Heights I,* the California Supreme Court set forth the following two-pronged test for determining whether reasonably foreseeable future activities must be included in an EIR project description: -30

> We hold that an EIR must include an analysis of the environmental effects of future expansion or other action if: (1) it is a reasonably foreseeable consequence of the initial project; and (2) the future expansion or action will be significant in that it will likely change the scope or nature of the initial project or its environmental effects.[41]

Under *Laurel Heights I,* DRP's environmental review of the Project should have included the streambed alteration agreement because it is both a reasonably foreseeable consequence of the Project, and will likely change the scope or nature of the initial project through conditions that would reduce Project impacts, including an alternate site layout. By failing to evaluate this aspect of the Project, DRP has violated the express provisions of the CEQA Guidelines and improperly piecemealed its environmental review of the Project.

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[37] *Id.* at pp. 4-21, 2.13-2.14.
[38] *Id.*, at p. 4-21 (emphasis added).
[39] *See e.g., id.* at p. 5.5-9.
[40] *Burbank-Glendale-Pasadena Airport Authority v. Hensler* (1991) 233 Cal.App.3d 577, 592; *Bozung v. Local Agency Formation Commission* (1975) 13 Cal.3d 263, 283-284.
[41] *Laurel Heights Improvement Assn. v. Regents of University of California* (1988) 47 Cal.3d 376, 390 (hereafter "*Laurel Heights*").

IV. THE DEIR FAILS TO PROVIDE AN ACCURATE DESCRIPTION OF THE ENVIRONMENTAL BASELINE

The DEIR employs an inaccurate and incomplete baseline, thereby skewing the impact analysis. An accurate description of the environmental setting is important because it establishes the baseline physical conditions against which a lead agency can determine whether an impact is significant.

The failure to adequately describe the existing setting contravenes the fundamental purpose of the environmental review process, which is to determine whether there is a potentially substantial, adverse change compared to the existing setting. CEQA requires the lead agency to include a description of the physical environmental conditions in the vicinity of a project as they exist at the time environmental review commences.[42] The description of the environmental setting constitutes the baseline physical conditions by which a lead agency may assess the significance of a project's impacts.[43]

The baseline environmental setting for CEQA review is the existing environment – not the environmental setting that could exist under existing entitlements and not a hypothetical environmental setting that might possibly exist in the future.[44] In *CBE v. SCAQMD*, the Supreme Court affirmed this basic CEQA rule, rejecting the SCAQMD's approach to the environmental baseline, wherein the District measured a proposed project's increased emissions against the maximum emissions that were allowed under a previously issued permit for a refinery.[45] In reaching this conclusion, the Court applied well-established case law from numerous appellate court decisions interpreting environmental baseline requirements under CEQA Guidelines section 15125.[46]

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[42] CEQA Guidelines § 15125, subd. (a).

[43] *Ibid.*

[44] *CBE v. SCAQMD* (2010) 48 Cal.4th 310, 322 (hereafter "*CBE v. SCAQMD*"); *see also Environmental Planning and Info. Council v. County of El Dorado* (1982) 131 Cal.App.3d 350, 354 (hereafter "*EPIC*") and *Friends of Eel River v. Sonoma County Water Agency* (2003) 108 Cal.App.4th 859, 874.

[45] *CBE v. SCAQMD*, 48 Cal.4th at 322.

[46] *Id.* at pp. 321-322, fn. 6-7, discussing, among other cases, *EPIC*, *supra*, 131 Cal.App.3d at p. 354 and *Save Our Peninsula Com. v. Monterey County Bd. of Supervisors* (2001) 87 Cal.App.4th 99, 121.

In addition to relying on the appropriate baseline, the EIR must describe the existing setting in sufficient detail to enable a proper analysis of project impacts.[47] DRP must gather relevant data, and provide an adequate description of the existing setting in a revised DEIR. -31

A. The DEIR Fails to Provide a Sufficiently Detailed Air Quality Setting

In *Galante Vineyards v. Monterey Peninsula Water Management District*, the Fourth District Court of Appeals found that an Air Quality section that briefly described the area as "sparsely populated, with no industry other than several vineyards" inadequate under CEQA because it failed to discuss a significant aspect of the environmental baseline in sufficient detail.[48] In this case, DRP's discussion of the Project's air quality setting in the DEIR suffers from the same error.

"The northern parts of Los Angeles County, including the Project area, are within the Valley Fever endemic area (Pappagianis and Vam Kekerix 2002). Matlof *et al* states that experience indicates that certain areas of Los Angeles County are endemic foci for *C. immitis*."[49] Valley Fever is caused by the microscopic fungus *coccidiodides immitis*. As described in the DEIR, infection can occur through spores that become airborne when contaminated soil is disturbed by human activities, such as agricultural activities or construction, and are inhaled.[50] Infection is often accompanies by flu like symptoms. In less than 1% of cases, however, the illness can spread to the lungs, brain, bone and skin. If left untreated, Valley Fever can lead to severe pneumonia, meningitis, and death.[51] -32

With regard to the Project setting, the DEIR states,

> [a]djacent to the proposed Project area, much of land is zoned for agricultural use. The Project site is not currently active agricultural land, but agricultural activities are ongoing in *nearby areas*.[52] -33

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[47] *Galante Vineyards v. Monterey Peninsula Water Management District* (1997) 60 Cal.App.4th 1109, 1121-22.
[48] *See id.*
[49] DEIR, p. 5.6-13.
[50] *See id.* at p. 5.6-11.
[51] *Id.*
[52] DEIR, p. 5.6-14 (emphasis added).

This description fails to provide sufficient detail regarding the concentration of agricultural activities around the Project site in order to ascertain whether the Project's contribution of dust blown *coccidiodides immitis* fungi spores could result in significant cumulative impacts. The DEIR should identify the agricultural activities and provide the distance of those activities from the Project site to analyze whether the Project could significantly impact public health. The DEIR's cursory discussion of "nearby" agricultural activities precludes an adequate analysis of the Project's air quality and public health impacts. DRP must prepare an EIR that adequately describes the environmental setting in order to accurately and adequately analyze potential significant impacts to air quality and public health. Without this baseline information, no substantial evidence exists to support the finding that the Project's relative contribution to the dissemination *coccidiodides immitis* fungi spores in the Project area is less than significant. -33

B. The DEIR Fails to Provide or Analyze a Biological Baseline for the Entirety of the Project Impact Area

The DEIR fails to establish an adequate biological baseline because the survey data covers only a portion of the Project impact area. The DEIR must evaluate the direct, indirect, and cumulative effects of a Project.[53] Indirect effects are changes in the physical environment that occur later in time or farther removed in distance than direct effects.[54] However, no biological surveys were done beyond the immediate Project boundaries.[55] -34

The Project site is irregular in shape, with five right-angle bends that envelope five non-Project areas on two sides (not including drainages).[56] Non Project-areas bounded on two or more sides by a development should be surveyed with the same intensity as the Project site itself because the proximity of adjacent lands when surrounded by development can be expected to be severely impacted by Project construction, operation and maintenance activities.[57] Additionally, small animals can easily move on and off site in a matter of minutes, and certainly within days.[58] For this reason, it is a standard practice to conduct surveys at least 100 -35

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[53] CEQA Guidelines §15126.2(a).
[54] CEQA Guidelines §15358(a)(2).
[55] Attachment B (Comments of Jim Cornett), p. 2.
[56] Attachment B (Comments of Jim Cornett), p. 1.
[57] *Id.* pp.1-2.
[58] *Id.*

yards beyond site boundaries since important biological resources may lie immediately off site.[59]

Absent survey data for the entirety of the Project impact area, including areas where indirect effects are likely, the DRP cannot evaluate the Project's impacts on existing biological resources. The Applicant must be required to provide biological baseline data for the entire Project impact area, and that information must be incorporated into the revised DEIR. -35

C. The DEIR Fails to Provide Biological Baseline Data for the Whole of the Project

Before undertaking a project, the lead agency must assess the environmental impacts of all reasonably foreseeable phases and components of a project.[60] An action is considered part of a proposed project under CEQA when it is conditioned on the approval of the proposed project.[61] Here, it is undisputed that the proposed gen tie is part of the Project.[62] As such, the environmental effects of the proposed transmission line must be evaluated with the same rigor as the main power plant facilities. However, the DEIR and supporting materials fail to provide any information regarding the survey efforts or state whether formal biological studies had been conducted for the portion of the transmission line lying in Kern County, and within the area of the proposed Whirlwind substation on which the Project plans to rely.[63] -36

The DEIR also fails to identify and describe the access road or roads that will be needed to install and service the transmission line in both counties.[64] Additional biological studies may need to be completed for the entire length of the transmission line, if the access road corridor will occupy an area that is wider than initially described in the DEIR.[65] Absent biological survey data for these Project components, DRP cannot fully evaluate the Project's potentially significant environmental effects. -37

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[59] *Id.*
[60] *Laurel Heights I, supra*, 47 Cal.3d at p. 396-97.
[61] *Tuolumne County Citizens for Responsible Growth v. City of Sonora* (2007) 155 Cal.App.4th 1214, 1231.
[62] *See* DEIR, p. 4-5.
[63] Attachment B (Comments of Jim Cornett), p. 2.
[64] *Id.*
[65] *Id.*

D. The Project Fails to Establish a Defensible Baseline With Regard to Terrestrial Vertebrae Within the Project Impact Area

Substantial evidence is defined as "enough relevant information and reasonable inferences from this information that a fair argument can be made to support a conclusion, even though other conclusions might also be reached."[66] According to the Biota Report, the biological surveys that were conducted on the Project site were directed toward birds and plants.[67] The only vertebrae observations were incidental. It is virtually impossible to conduct valid surveys for terrestrial vertebrates while looking upward at birds.[68] The scientifically invalid baseline data provided by the Applicant simply does not constitute substantial evidence. Absent adequate data regarding the baseline conditions at the Project site, Project impacts cannot be evaluated. -38

E. The DEIR Fails to Provide a Defensible Baseline for the Western Burrowing Owl

According to the Applicant's Biota Report, most of the burrowing owl protocol surveys were conducted at the wrong time, when owls are less likely to be observed, and during extremely windy conditions.[69] For these reasons, it is highly likely that burrowing owls were underestimated in the census provided by the Applicant. Based on the survey information provided in the DEIR, it is impossible to accurately assess the magnitude of Project impacts on this species.[70] The Applicant must resurvey the Project site to accurately determine baseline conditions with regard to the Western burrowing owl.[71] -39

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[66] *Uphold Our Heritage v. Town of Woodside* (2007) 147 Cal.App.4th 587, 596. *See also Lucas Valley Homeowners Assoc. v. County of Marin* (1991) 233 Cal.App.3d 130, 157 ("irrelevant generalization, too vague and nonspecific to amount to substantial evidence of anything").
[67] DEIR, Appendix E, pp.4-66-4-67.
[68] Attachment B (Comments of Jim Cornett), p. 2.
[69] *Id.* at p. 5.
[70] Attachment B (Comments of Jim Cornett), p. 5.
[71] *Id.*

F. The DEIR Fails to Provide a Defensible Baseline for Groundwater Pumping at the Project Site

The baseline environmental setting for CEQA review is the existing environment – not the environmental setting that could exist under existing entitlements and not a hypothetical environmental setting.[72] The existing physical conditions are normally assessed at the time the notice of preparation of a CEQA document is published.[73] Courts have allowed the lead agency to use an average over a range of time periods to ascertain the most accurate description of existing conditions where there is substantial evidence to support a finding that environmental conditions can vary from year to year.[74] However, the lead agency's assumptions regarding average conditions must be made clear in the DEIR and supported by substantial evidence.[75] -40

The DEIR appears to use (a) groundwater use dating back to 1990, and (b) the Applicant's theoretical entitlement to groundwater as the environmental baseline for Project impacts.

DRP's selection of 1990 conditions is arbitrary and violates CEQA.[76] DRP provides the following rationale for its baseline analysis, -41

> For the purpose of Section 5.14 [Utilities], including Sections 5.14.2.1.2 [Project Water Supply] and 5.14.3.2.1 [Project Water Supply Impacts], the relevant period for determining historic water usage within the Antelope Valley Groundwater Basin in the Adjudication process, which has implications for resolution of claims of prescription and claims of

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[72] *CBE v. SCAQMD, supra,* 48 Cal.4th at p. 322; *see also EPIC, supra,* 131 Cal.App.3d at 354 and *Friends of Eel River v. Sonoma County Water Agency, supra,* 108 Cal.App.4th at 874.

[73] *See Cadiz Land Company, Inc. v. San Jose City Council supra,* 83 Ca.App.4th at 86 ("The EIR must describe environmental conditions in the vicinity of the project, "as they exist at the time the notice of preparation is published, or if no notice of preparation is published . . . this environmental setting will normally constitute the baseline physical conditions by which the lead agency determines whether an impact is significant.").

[74] *See e.g. San Joaquin Raptor Rescue Center v. County of Merced* (2007) 149 Cal.App.4th 645, 658;

[75] *Id.*; *see also Planning and Conservation League v. Castaic Lake Water Agency* (2009) 180 Cal.App.4th 210, 248-49.

[76] *See CBE v. SCAQMD, supra,* 48 Cal.4th at p. 322.

overlying owners to quiet title to water rights, is likely to be a 5-year period in the 1990s to be determined by the Court.[77] -41

First, historic water usage is not the same as the physical environmental conditions in the vicinity of the Project as they existed at the time the environmental review commenced.[78] Second, DRP's explanation of historic water usage does not substitute for a rationale of how historic water uses provide an accurate description of current conditions, as required by CEQA. Third, a determination with regard to the Applicant's groundwater entitlement has not been made, but even if it had, various courts have held that an entitlement to use an amount of water is not the same as a determination of actual use: "the impacts of the project must be measured against the real conditions on the ground."[79] As such, any future judicial determination regarding the Applicant's groundwater right, if any, does not absolve DRP from evaluating the Project's impacts as measured against current conditions. DRP is required to conduct a good faith inquiry into actual, current conditions at the Project site to ascertain whether the proposed Project pumping will result in significant adverse environmental effects.[80] Therefore, DRP's analysis must be revised. -42

The DEIR's reliance on groundwater extractions records dating back to the 1990s results in a grossly inaccurate assessment of baseline conditions. Reportedly, some portions of the Project site were used for alfalfa production from 1960 through the early 1990s.[81] Alfalfa is a notoriously thirsty crop, and one which has been steadily abandoned by farmers in arid regions of California.[82] The *only* evidence cited in the DEIR to support the claim that alfalfa was ever cultivated on the Project site is a conversation between the Applicant's consultant and the former property owners.[83] Moreover, the site was more recently farmed in 2004.[84] At that time, the Project site was reportedly used for pistachio orchards and onions, both -43

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[77] DEIR, p. 5.14-7.
[78] *See* CEQA Guidelines § 15125(a).
[79] *See Save Our Peninsula Committee v. Monterey County Board of Supervisors* (2001) 87 Cal.App.4th 99, 121.
[80] *Id.*, at 121 (collecting cases.) *Cadiz Land Company, Inc., v. Rail Cycle, L.P., supra*, 83 Cal.App.4th at 87.
[81] DEIR, p. 5.5-8.
[82] *See* generally, Attachment C (Hanson et al.); Attachment D (Rosekrans), Ch. 3. p. 16.
[83] *See e.g.*, DEIR, p. 5.5-8.
[84] DEIR, p. 5.14-8.

crops require much less water than alfalfa.[85] This chronology of agricultural activities at the Project site is consistent with the general pattern of agricultural production in Antelope Valley, which shows a steady shift from the cultivation of alfalfa to the cultivation of less thirsty crops, such as pistachio orchards (which can be watered only four months out of the year) and onions.[86] -43

DRP estimates that the *current* groundwater usage at the Project site is equivalent to the average farmhouse domestic use, or 1 AFY.[87] However, there is little evidence in the DEIR to support a finding that the Project site was actually occupied at the time the notice of preparation was published. The absence of credible information regarding current conditions, and DRP's reliance on past conditions, invalidate DRP's finding that Project impacts to water supply in Antelope Valley are less than significant. However, a proper analysis of the Project's impacts to groundwater resources is critical in this case. -44

As described in the DEIR, the Antelope Valley Groundwater Basin is in overdraft. Groundwater extractions have exceeded the estimated natural recharge of the basin since the 1920s, which has resulted in declining water levels and land subsidence.[88] The region now relies on imported water to reduce and avoid overdraft conditions.[89] Although groundwater levels have experienced a slight rise in the Project area, the DEIR suggests that this may be due to a decrease in agricultural and industrial activity in the Project area.[90] More importantly, the Project area remains in overdraft. Therefore, DRP must revise the DEIR to analyze whether *resumed* groundwater pumping at the Project site will have adverse effects on groundwater resources in the Lancaster subunit or the Antelope Valley Groundwater Basin. In order to do this, DRP must first conduct a good faith inquiry into the actual, existing conditions at the Project site. Without this information, it is impossible to identify the appropriate environmental baseline for the purposes of CEQA and to assess the Project's impacts on groundwater supplies.[91] Because an adequate analysis of baseline conditions is absent from the -45

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[85] Attachment E (Minutes of the Significant Ecological Area Technical Advisory Committee (SEATAC) Meeting of 11 May 2009), p. 6.
[86] Attachment F (UC Davis Drought Management: Pistachios); Attachment G, p. 16.
[87] DEIR, p. 5.5-9.
[88] DEIR, p. 5.14-4.
[89] *See id.*
[90] *Id.*, at p. 5.14-5.
[91] *See Save Our Peninsula Committee v. Monterey County Board of Supervisors* (2001) 87 Cal.App.4th 99, 119.

DEIR, DRP has failed to support its conclusion that the Project will not result in significant impacts to groundwater resources with substantial evidence.[92] -45

G. The DEIR Fails to Provide a Sufficiently Detailed Description of Groundwater Pumping Activities Surrounding the Project Site

The DEIR also fails to provide the public and decisionmakers with relevant information regarding surrounding groundwater use. Although the materials provided by the Applicant identify several wells in the vicinity of the Project site, the DEIR fails to provide any information regarding the current use of those wells, and whether groundwater pumping has caused drawdown in surrounding wells. This highly apparent gap in the DEIR's description of the environmental setting precludes an adequate analysis of Project impacts on groundwater resources, and specifically well drawdown in surrounding wells.

It is apparent that well drawdown constitutes an effect on the environment within the meaning of CEQA, as the groundwater level at neighboring wells is part of the "physical conditions which exist within the area which will be affected by [the] proposed project."[93] Moreover, the DEIR makes clear that numerous Antelope Valley groundwater rights holders, including the Applicant, are in litigation before the Los Angeles County Superior Court regarding the priority of use in the Antelope Valley Groundwater Basin.[94] This suggests that there are insufficient groundwater supplies to satisfy the needs of all groundwater rights holders. According to the DEIR, "[t]he case involves many complex legal issues, hundreds of parties, and may take years to be resolved."[95] -46

Without basic information regarding groundwater pumping in the vicinity of the Project site, DRP cannot evaluate the effect of Project pumping on surrounding resources. DRP must prepare a revised DEIR that adequately describes the environmental baseline for groundwater resources.

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[92] *See id.*
[93] *Protect the Historic Amador Water Ways v. Amador Water Agency* 116 Cal.App.4th 1099, 1111, *citing* Pub. Resources Code § 21060.5.
[94] *See* DEIR, p. 5.14
[95] DEIR, p. 5.14-7.

H. The DEIR Fails to Provide a Defensible Baseline Analysis of the Antelope Valley Groundwater Basin

DRP's analysis of baseline conditions in the Antelope Valley Groundwater Basin is gravely flawed. DRP purports to base its analysis of the Antelope Valley basin hydrology on a two page memorandum, provided by the County of Los Angeles Department of Public Works, dated June 10, 2010. Citing to the June 10, 2010 memorandum, the DEIR states that "the average annual native recharge plus local return flows is currently estimated as approximately 82,300 AFY."[96] The DEIR further provides, citing to the same memorandum, that "coupled with return flows from imported water, the total sustainable yield of the Basin is estimated to be approximately 110,000 AFY."[97] -47

First, the June 10, 2010 memo does not make these findings. Instead, DRP appears to be citing claims that are made by the Applicant's consultant in support of the Project. According to the Applicant, 82,300 AFY describes the sustainable yield, when counting only "return flows [that] derive from the use of local groundwater only."[98] Alternatively, when also counting the use of supplemental waters, which "augmented natural recharge," sustainable yield is "about 100,000 AFY"[99] Neither of these conditions represent the existing environmental setting under CEQA.

Baseline conditions in the Antelope Valley Groundwater Basin are characterized by overdraft.[100] "Water-level data collected in spring 1996 (Carlson and others, 1998) represent regional water levels after more than 75 years of ground-water development in the basin . . . . In the Lancaster subbasin, depth to water is more than 100 ft below land surface throughout most of the subbasin and the water table has declined to a level that has eliminated the discharge of ground water by evapotranspiration."[101] This information must be clearly stated in the revised DEIR in order to inform the public of existing conditions. -48

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[96] DEIR, p. 5.14-4.
[97] DEIR, p. 5.14-4.
[98] DEIR, Appendix J.2, Memorandum from Joseph C.Scalmanini, Luhdhorff & Scalmanini Consulting Engineers to Dennis Hunter, Los Angeles Department of Public Works p. 6.
[99] *Id.*
[100] Attachment G (USGS 2003: Simulation of Ground-Water Flow and Land Subsidence, Antelope Valley Ground-Water Basin, California), p. 3.
[101] Attachment G, p. 20.

DRP must prepare a revised DEIR that adequately describes the Antelope Valley Groundwater Basin. -48

I. The DEIR Fails to Fairly Disclose Baseline Soil Conditions at the Project Site

The DEIR fails to fully disclose the extent of soil contamination from former agricultural activities at the Project site. Specifically, the DEIR fails to disclose the environmental conditions described in the Phase I Environmental Site Assessment ("Phase I ESA") prepared by Michael Brandman Associates, a report that is cited in the DEIR but not made available within the DEIR Appendices. The Phase I ESA includes the following information:

> Soil sampling within the 80 acres south of the occupied/ranch headquarters area, used since the previous testing to grow onions, should be conducted to confirm that no further action under federal or state guidelines is required.[102]

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The DEIR indicates that onion farming continued through 2005 on the 80-acre tract, but fails to state when onion farming commenced on the Project site.[103] This information is necessary to evaluate the extent of contamination at the Project site. A number of pesticides are currently known to be used in onion farming, including Diazinon, Metam potassium, Metam sodium, and 1,3 – Dichloropropene.[104] The DEIR provides no evidence to suggest that any sampling has been done on the Project site, and does not even attempt to describe the type of pesticides that may have been actually used.[105] Therefore, the DEIR fails to disclose existing soil conditions at the Project site.

J. The DEIR Fails to Adequately Analyze the Visual Baseline at the Project Site

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The DEIR fails to explain how the post-construction KOP simulations provided in the DEIR (Figures 5.10-4 to 5.10-13) were created. Typically,

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[102] Michael Brandman Associates, Phase I ESA (2007), p. 2.
[103] DEIR, p.5.9-4.
[104] Attachment A (Comments of Matthew Hagemann), p. 3.
[105] *Id.*

documentation on key observation points includes software used to create the images, the camera aperture, focal length, camera height and other factors that would affect the quality of the rendered image.[106] Without the data, the accuracy of the rendered image is uncertain.[107] The DEIR should be revised to provide data on the KOP simulations and to provide a narrative on the suitability of the rendered images in providing an accurate portrayal of the visual impacts. -50

A revised DEIR should be prepared to include two simulated images from a KOP 1 along State Highway 138 at a location amidst the panel array. The simulated view from KOP 1 (Figure 5.10-5) is inadequate in simulating a "worst case" motorist viewpoint because the perspective does not simulate views to the north and south of the panel arrays.[108] Therefore, at least two images from KOP 1 should be generated to simulate a motorist's view on State Highway 138 to the north and to the south.[109] -51

Simulated images were included in the DEIR for KOPs that include the Antelope Valley California Poppy Reserve and the Arthur B. Ripley Desert Woodland State Park. However, a simulated post-construction image was not prepared for a KOP at the Fairmont/Antelope Buttes area, managed by the Santa Monica Mountains Conservancy, and located less than a half-mile from the Project.[110] KOP 3, prepared for the Antelope Valley California Poppy Reserve, is more than two miles from the Project and is therefore not representative of the view from the Fairmont/Antelope Buttes area, a location with potential recreational value.[111] A KOP should be prepared to include a simulated image from the Fairmont/Antelope Buttes area representative of the viewpoint of a hiker overlooking the Project.[112] -52

The DEIR must be revised to include sufficient information to enable an adequate analysis of visual conditions at the Project site. Because the DEIR's analysis is based on an inadequate description of existing visual resources, its analysis of Project impacts on visual resources is invalid. -53

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[106] Attachment A (Comments of Matthew Hagemann), p. 5.
[107] *Id.*
[108] *Id.* at p. 5-6.
[109] *Id.*
[110] *Id.*
[111] *Id.*
[112] *Id.*

V. THE DEIR FAILS TO ANALYZE THE PROJECT'S POTENTIALLY SIGNIFICANT ENVIRONMENTAL EFFECTS

The lead agency's identification of a project's significant environmental effects is one of the primary purposes of an EIR and is necessary to implement CEQA's policy that significant environmental effects are mitigated to the degree feasible before Project approval.[113] A draft EIR must identify and focus on the possible significant environmental impacts of a proposed project.[114] In preparing an EIR, the agency must consider and resolve every fair argument that can be made about the possible significant environmental effects of a project, irrespective of whether an established threshold of significance has been met with respect to any given effect."[115] If after preparing the Initial Study the lead agency determines that an effect is less than significant, the EIR must provide "a statement briefly indicating the reasons for determining that various effects on the environment of a project are not significant."[116]

A. The DEIR's Finding of No Significant Project Effects on Public Health From Valley Fever is Invalid Because It is Not Based on Substantial Evidence

The DEIR's Air Quality anlaysis dismisses the potential for the Project to significantly impact the incidence of public exposure to *Coccidiodides immitis* with the following statement:

> At present, the local population is exposed to significant levels of dust, and the dust in the region is believed to contain the *C. immitis* fungi, thus the local population is most likely exposed to *C. immitis* fungi (i.e. Valley Fever).[117]

The DEIR appears to conclude, without expressly stating, that there is no risk of public exposure because the local populace is already currently exposed to dust

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[113] Kostka & Zischke, Practice Under the California Environmental Quality act (2nd Ed. 2010), §13.2.
[114] Pub. Resources Code § 21100(b)(1); CEQA Guidelines §§ 15126(a), 15126.2.
[115] *Protect the Historic Amador Water Ways v. Amador Water Agency* 116 Cal.App.4th 1099, 1109.
[116] *Id. citing* CEQA § 21100(c); *see also* CEQA Guidelines § 15128.
[117] DEIR, p. 5.6-14.

likely containing the fungi.[118] This statement of reasons is inadequate because the DEIR fails to provide *facts, reasonable assumptions* predicated upon *facts*, or *expert opinion* supported by *facts* to buttress its conclusion that the local population is not at risk because the rate of infection has stabilized.[119] On the contrary, the facts in the record strongly suggest that increased and continued exposure to dust containing *Coccidiodides immitis* fungal spores *increases* the risk of infection, and could potentially lead to infection outside of the immediate Project area. Following is an abbreviated list of substantial evidence provided in the DEIR of potentially significant impacts on public health:

> Historically, people at risk for infection are individuals not already immune to the disease and whose jobs involved *extensive contact* with soil dust . . . (LACDPH 2004);[120]
>
> Valley Fever cases may be caused due to soils containing fungal spores that become disturbed by wind erosion, vehicular transportation, construction, or farming. Even natural phenomena, such as earthquakes or wildfires may disturb soils containing the fungi . . . dispers[ing] the small infectious particles *miles from their place of origin* (Cavenaugh 2004);[121]
>
> In any given year, about 3 percent of people who live in an area where coccidiodomycosis *is common* will develop and infection (LACDPH 2004);[122]
>
> Kern, Los Angeles, and San Diego counties had the highest total number of hospitalizations and together accounted for 47 percent of all hospitalizations due to coccidiodomycosis in the state of California during this time period. There were 417 deaths from 1997 to 2002, resulting in a mortality rate of 2.1 per 1 million California residents annually. Death from coccidiodomycosis average about 70 per year statewide (Flaherman et al. 2007); and[123]

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[118] DEIR, p. 5.6-28.
[119] *See* Pub. Resources Code, § 21082.2(c).
[120] DEIR, p. 5.6-11 (emphasis added).
[121] DEIR, p. 5.6-12 (emphasis added).
[122] DEIR, p. 5.6-12 (emphasis added).
[123] DEIR, p. 5.6-14.

> In 2008, Valley Fever incidences were 14.2 per 100,000 persons in the Antelope Valley, compared to the rest of Los Angeles County where Valley Fever incidences were 2.33 per 100,000 persons (Antelope Valley Partners for Health 2009).[124]

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In short, *nothing* in the record supports DRP's wildly inaccurate conclusion that because the risk already exists, the Project's cumulative contribution to that risk is not significant.

Numerous aspects of the Project will result in significant long-term increases in dust without proper mitigation. Such increases are expected from the proposed internal roadway system, which will include a network of compacted dirt roads between solar blocks.[125] The DEIR admits that the impact from dust is significant and should be mitigated with dust suppression activities "as necessary."[126] Absent adequate mitigation, increased dust will also be caused by removal of vegetation within proposed Project fire breaks, including 100 foot wide perimeter fire breaks and 200 foot wide fire breaks within the facility.[127] Lastly, the Project proposes a 4.25 mile long transmission line, which will require an access road.[128] However, the DEIR fails to even identify the road or state whether the road will be paved.

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DRP must recirculate a revised DEIR that addresses the public's significant risk of exposure to *Coccidiodides immitis* during Project construction, and ensures that the dust suppression proposed will adequately protect the public from increased risk of exposure. In the very least, DRP should endeavor to produce an environmental review document that contains a rational line of reasoning between the facts presented and the conclusions that are reached based on those facts.

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[124] DEIR, p. 5.6-14.
[125] *See* DEIR, p. 4-12.
[126] *Id.*
[127] DEIR, p. 4-26.
[128] DEIR, p. 4-5, 4-6.

B. The DEIR Fails to Analyze the Effect of Project Grading Activities on Rates of Valley Fever Infection in Workers

The DEIR must evaluate the significant impacts of the *Project* as proposed.[129] While DRP assumes, as a general matter, that there is a potentially significant risk that workers may contract Valley Fever during Project construction, DRP has made no effort to evaluate *the Project* to determine the severity of the risk. DRP's failure to analyze the proposed Project contravenes CEQA's policy that significant environmental effects are *mitigated to the degree feasible* before Project approval.[130] -58

The Project will generate significant amounts of dust during construction, which could be harmful to workers without proper mitigation. The earth moving activities will include excavation and grading on and off site. These activities will include the creation of more than *nine thousand* infiltration basins and banks throughout the site.[131] It is unclear from the DEIR how much cut and fill will be involved, or whether the cut and fill will be balanced on site, however the range provided in the DEIR and supporting materials is somewhere between 250,000 and 700,000 cubic yards.[132] Additional short term dust emissions can be expected from the construction of the proposed Project cutoff wall, which will involve driving sheet piles into the ground to an approximate depth of 15 feet to contain a stream that meanders through the heart of the Project site.[133] The DEIR provides no analysis of these Project components. -59

DRP must prepare a revised DEIR that actually analyzes the proposed Project to evaluate the significance of the risk of infection posed to workers during construction. A fundamental purpose of an EIR is to identify ways in which *a proposed project's significant environmental effects* can be mitigated or avoided.[134] Absent such analysis, DRP cannot make a showing that the mitigation proposed in the DEIR will reduce the risk to a level of insignificance. -60

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[129] Pub. Resources Code §21100(b)(1); *see also* CEQA Guidelines §§ 15126(a), 1516.2(a), 15143.
[130] Kostka & Zischke, Practice Under the California Environmental Quality act (2nd Ed. 2010), §13.2.
[131] DEIR, p. 4-22-23.
[132] *See supra*, Comments Section III.A, Project Description.
[133] *See* DEIR, p. 4-23.
[134] *See* Pub. Resources Code §§ 21002.1(a), 21061.

C. The DEIR Fails to Evaluate Project Impacts on Mohave Ground Squirrel

The Mojave ground squirrel is listed as a threatened species under the California Endangered Species Act. The DEIR finds that the potential for the species to exist on the Project site is low based on the rationale that cultivation of the Project site since the late 1940s has made the habitat unsuitable for the species.[135] The absence of the Mojave ground squirrel from the Project area of impact has not been adequately shown.[136] Instead, there is substantial evidence that the Mojave ground squirrel may exist on the Project site, which is within the species' range. Moreover, recent studies indicate that the species has been found throughout Antelope Valley, large parts of which are in agricultural use.[137] The Applicant has made no effort to rebut this assertion having elected to forego focused trapping surveys on the Project site.[138] -61

DRP's finding of no significant impact must be based on substantial evidence. The DEIR may not rely on outdated scientific information, but must reflect a good faith effort on the part of the lead agency to study the Project's potentially significant impacts on biological resources. DRP has failed to support its finding that the Project will not result in potentially significant impacts to the Mohave ground squirrel.

D. The DEIR Fails to Evaluate Project Impacts to Desert Tortoise

The desert tortoise is listed as a threatened species under both the state and federal Endangered Species Acts. The DEIR states that "based on biological surveys, literature review, and consultation with USFWS [U.S. Fish and Wildlife Service] and CDFG [California Department of Fish and Game], the Project site does not contain and is not known to contain desert tortoise, [or] suitable desert tortoise habitat."[139] This statement is, at best, inconsistent with the record evidence. -62

Contrary to the statement provided in the DEIR, FWS *has* found that suitable habitat exists within the Project site and that absence of the desert tortoise cannot be shown. A letter from USFWS dated June 16, 2009, states that "some

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[135] DEIR, 5.7-104.
[136] Attachment B (Comments of Jim Cornett) p.3.
[137] *See id.*
[138] *Id.*
[139] DEIR, p. 5.7-73.

potential exists that the project site and areas along the proposed transmission line may support individuals of the federally threatened desert tortoise . . . [t]o determine whether desert tortoise occur in the project area, we recommend that the proponent survey areas that would be affected by construction and operation of the solar plant and transmission line" in accordance with USFWS survey protocol.[140] In an email from FWS, dated July 9, 2009, the Service retracted its initial recommendation that surveys be conducted but concluded that an avoidance strategy should nevertheless be implemented due to presence of native habitat within the Project impact area.[141] -62

The desert tortoise is a known resident of Antelope Valley and is an inhabitant of at least some of the habitats within the project boundaries.[142] Because no focused surveys for desert tortoise have been conducted, its presence on the Project site cannot be ruled out. As such, DRP has failed to support its findings of no impacts with substantial evidence as required by CEQA.

E. The DEIR's Finding of No Impacts to the Greater Roadrunner During Project Construction Is Not Based on Substantial Evidence

Greater roadrunners are relatively mobile,[143] and one greater roadrunner was observed on site even though no focused surveys for the species were conducted within the Project impact area.[144] The DEIR states that "construction activities on-site should present little risk to eggs and nestlings, since no nests are expected due to lack of suitable nesting habitat."[145] This finding is not supported by substantial evidence. According to the information provided in the DEIR, suitable habitat for the Greater roadrunner does exist on the Project site.[146] As such, the DEIR should be revised to include mitigation measures for impacts to the Greater roadrunner during Project construction. -63

[140] DEIR, Appendix A.
[141] *Id.*
[142] Attachment B (Comments of Jim Cornett), p.3.
[143] DEIR, p.5.7-39.
[144] *See* Attachment B (Comments of Jim Cornett), p.5; DEIR, p. 5.7-51.
[145] DEIR, p. 5.7-40.
[146] Attachment B (Comments of Jim Cornett), p. 5.

F. The DEIR Fails to Adequately Evaluate Project Impacts to State Jurisdictional Waters

Water courses that cut through the heart of a project, as is the case here, are likely to be impacted by construction and grading activities, as well as facility operation if not adequately mitigated.[147] Here, the DEIR fails to provide any data, opinions of biologists, or other relevant regulatory material, that the use of 100 foot setbacks would adequately protect the jurisdictional features on the Project site. It is also clear from DRP's records that the Center for Biological Diversity recommends 1,000 foot to 500 foot setbacks to mitigate significant impacts to drainage features.[148] This fact is not found in the DEIR. The DEIR also fails to evaluate numerous potential impacts to onsite drainage, including inadvertent dumping of toxic materials into channels during construction.[149] -64

G. The DEIR Fails to Adequately Analyze the Effects of Project Groundwater Pumping on Surrounding Wells

"The fundamental purpose of an EIR is to provide public agencies and the public in general with detailed information about the effect which a proposed project is likely to have on the environment."[150] To that end, the EIR "shall include a detailed statement setting forth . . . [a]ll significant effects which a proposed project is likely to have."[151]

The Initial Study prepared for the Project indicates that the Project's impacts to water supplies are potentially significant.[152] The DEIR then finds no significant impacts to water resources and requires no mitigation.[153] In reaching this conclusion, however, DRP neglected to analyze the effect of Project pumping on surrounding wells. This omission is a significant flaw in DRP's analysis of the Project's potential effects. As stated by the Supreme Court in *Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho Cordova* ("*Vineyard*"), the ultimate question under CEQA is not whether an EIR establishes a likely source of water, but whether it adequately addresses the reasonably foreseeable impacts of -65

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[147] Attachment B (Comments of Jim Cornett), p.6.
[148] Attachment H (Email from DRP to CDFG, January 13, 2009).
[149] Attachment B (Comment of Jim Cornett), p. 6.
[150] *Vineyard Area Citizens for Responsible Growth, Inc.* (2007) 40 Cal.4th 412, 428 ("*Vineyard*").
[151] *Id. citing* Pub. Resources Code § 21100(b)(1).
[152] DEIR, Appendix A, Attachment 2, p. 20.
[153] *See* DEIR, p.5.14-12,

supplying water to the project.[154] In this respect, the DEIR's analysis of the Project's *effects* on surrounding well users is decidedly inadequate. -65

That groundwater pumping at the Project site may have impacts on surrounding wells is a reasonably foreseeable proposition, particularly because the Antelope Valley Groundwater Basin is characterized by overdraft conditions and the area surrounding the Project site is not served by a public domestic water supply system.[155, 156] The likelihood of adverse effects on groundwater resources as a result of Project pumping is further underscored by the fact that, according to the DEIR, there are currently no restrictions on groundwater pumping in Antelope Valley.[157] Significantly, the construction phase of the Project, which proposes the most aggressive pumping rate – 150 AFY as opposed to approximately 12 AFY for operation – would likely occur before the Antelope Valley Groundwater Basin could be adjudicated, indeed the DEIR assumes that would be the case. Yet, the DEIR fails entirely to consider the impacts of groundwater use at the Project on surrounding wells, how any adverse impacts will be mitigated, and the impacts of likely future water sources if groundwater ceases to be sufficient.[158] The Applicant's submissions also lack this analysis, focusing instead on the likelihood that the irrigation well *at the Project site* can be relied upon as an adequate source of water.[159] -66

From the information provided, it is clear that DRP has not even pondered the issue of future drawdown in surrounding wells as a result of the Project. Even if DRP found that impacts to surrounding wells were not significant, DRP failed to provide "a statement briefly indicating the reasons for determining that various effects on the environment of a project are not significant."[160] However, even this finding must be based on substantial evidence. An analysis of this potentially significant impact must be included in a revised DEIR and the revised DEIR must be recirculated for public review and comment in accordance with CEQA. -67

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[154] *Vineyard, supra*, 40 Cal.4th at 432; *see also Laurel Heights I, supra*, 47 Cal.3d at pages 398-399.
[155] *See* DEIR, p. 5.14-16.
[156] *See Santiago County Water Dist. v. County of Orange* (1981) 118 Cal.App.3d 818, 830-31; *Stanislaus Natural Heritage* (1996) 48 Cal.App.4th 182, 206,
[157] DEIR, p. 5.4-12.
[158] *See* DEIR, pp. 5.14-11-17.
[159] *See generally*, DEIR, Appendix J.
[160] CEQA Guidelines § 15128.

H. The DEIR Fails to Evaluate Hazards to Plant and Animal Species as a Result of the Project

The Applicant's proposal to extensively grade and water the proposed Project site would result in the introduction of exotic weed species to the Project site and the immediate vicinity and would represent a significant hazard to native plant and animal species that must be mitigated.[161] Despite this, the DEIR fails to evaluate hazards to wildlife from increased raven populations as a result of landscape irrigation. The DEIR also fails to evaluate exotic weeds or to require a comprehensive weed management plan, including the identification of a complete list of herbicides that will be used on site. Thus, the DEIR must be revised and recirculated for public review. -68-

I. The DEIR Fails to Evaluate the Project's Effects on the Antelope Valley Groundwater Basin

CEQA requires the lead agency to include a description of the physical environmental conditions in the vicinity of a project as they exist at the time environmental review commences.[162] The description of the environmental setting constitutes the baseline physical conditions by which a lead agency may assess the significance of a project's impacts.[163] The baseline environmental setting for CEQA review is the existing environment – not the environmental setting that could exist under existing entitlements and not a hypothetical environmental setting.[164] The existing physical conditions are normally assessed at the time the notice of preparation of a CEQA documents is published.[165] As discussed in Section IV(H) of these Comments, the basin is currently in overdraft. -69-

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[161] Attachment B (Comments of Jim Cornett), p.7.

[162] CEQA Guidelines § 15125, subd. (a).

[163] *Id.*

[164] *CBE v. SCAQMD, supra*, 48 Cal.4th at p. 322; *see also EPIC, supra*, 131 Cal.App.3d at 354 and *Friends of Eel River v. Sonoma County Water Agency* (2003) 108 Cal.App.4th 859, 874.

[165] *See Cadiz Land Company, Inc., supra*, 83 Ca.App.4th at 86 ("The EIR must describe environmental conditions in the vicinity of the project, "as they exist at the time the notice of preparation is published, or if no notice of preparation is published . . . this environmental setting will normally constitute the baseline physical conditions by which the lead agency determines whether an impact is significant.").

A threshold of significance may be useful to determine whether an environmental impact normally should be considered significant.[166] However, "[a] public agency cannot apply a threshold of significance or regulatory standard in a way that forecloses the consideration of any other substantial evidence showing there may be a significant effect.[167] The DEIR relies on a theoretical sustainable yield of 82,300 AFY as a threshold of significance, where exceedence of the total sustainable yield (and an exceedence of an allocation of that yield) would be deemed significant.[168] There are two significant legal problems with the County's threshold of significance.

First, despite DRP's proposal to use a claimed sustainable yield as a threshold of significance, DRP never makes a finding of significance.[169] DRP readily admits this because DRP believes, nonsensically, that it must know the Applicant's eventual allocation of the total theoretical sustainable yield. DRP's effort to understand whether the Applicant has any legal entitlement to the water is valiant, but it does not substitute for and is not relevant to an impact analysis under CEQA. The Applicant's allocation of the total sustainable yield is not known at this time, and therefore DRP is unable to make a finding of significance based on the referenced sustainable yield. -69-

Second, DRP confuses its requirement to determine whether the Applicant is legally entitled to use groundwater with its requirement to analyze significant impacts under CEQA. The DEIR states that "to determine whether or not the Project would result in a significant impact, it is necessary also to consider whether the Project's water usage would be consistent with the amount of water estimated to be allocated to the Project site as its share of the safe yield for the Basin."[170] The DEIR then proceeds to evaluate the uncertainty of the Project's proposed water supply.[171] DRP's analysis conflates two, distinct inquiries under CEQA: the impacts of a proposed use on water resources and the impacts of alternative uses if the proposed use is uncertain. Where there is uncertainty, the lead agency is required to evaluate the impacts of alternative uses,[172] however, the agency is first required -70-

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[166] CEQA Guidelines § 15064.7(a).
[167] *Mejia v. City of Los Angeles* (2005) 130 Cal.App.4th 322, 342 (internal quotations omitted).
[168] DEIR, pp. 5.4-4, 5.14-12.
[169] DEIR, p.5.14-13.
[170] DEIR, p. 5.14-13.
[171] *Id.*
[172] *Vineyard, supra,* 40 Cal.4th at 432; *see also Napa Citizens for Honest Government v. Napa County Bd. of* Supervisors (2001) 91 Cal. App.4th 342, 373.

to evaluate the impacts of the proposed use.[173] Thus, in order to arrive at a finding of significance, DRP must evaluate the impacts of *the proposed groundwater pumping* on the Antelope Valley Groundwater Basin. [174] -70

The fact that the Antelope Valley Groundwater Basin is currently characterized by conditions of overdraft suggests that any additional pumping results in potentially significant adverse impacts.[175] In *Kings County Farm Bureau v. City of Hanford*, the Court held that an EIR was legally inadequate because the lead agency misapplied CEQA in assessing both project-specific and cumulative air quality impacts. The City of Hanford failed to evaluate the significance of the impact when compared to the existing setting. Instead, the City improperly claimed that a project's emissions were minor when compared to other existing emissions in the air basin.

> "The significance of an activity depends on the setting. (Guidelines, §15064, subd.(b).) The relevant question to be addressed in the EIR is not the relative amount of precursors emitted by the project when compared with preexisting emissions, but whether any additional amount of precursor emissions should be considered significant in light of the serious nature of the ozone problems in [the] air basin." [176] -71

Here too, DRP claims that the Project's water extraction is small compared to other hypothetical existing water extractions in the basin (under a safe yield scenario). However, the relevant question to be addressed is not the relative amount of water use by the Project when compared to other users in a not-yet-achieved potential future sustainable yield in the basin, but whether any additional amount of water use should be considered significant in light of the serious nature of the overdraft problems in the groundwater basin.

Substantial evidence suggests that groundwater pumping results in adverse impacts to the Antelope Valley Groundwater Basin. Ground subsidence in the

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[173] Pub. Resources Code § 21100(b)(1); CEQA Guidelines §§ 15126(a), 15126.2
[174] *Vineyard, supra*, 40 Cal.4th at 432; *see also Laurel Heights I, supra*, 47 Cal.3d at 398-399.
[175] *See e.g., Kings County Farm Bureau v. City of Hanford* (1990) 221 Cal.App.3d 692, 718 ('The relevant question to be addressed in the EIR is not the relative amount of precursors emitted by the project when compared with preexisting emissions, but whether any additional amount of precursor emissions should be considered significant in light of the serious nature of the ozone problems in this air basin.")
[176] *Id. at* 718.

Antelope Valley has resulted from groundwater withdrawal, and natural recharge has been impeded due to groundwater pumping in the Basin.[177] Therefore, any groundwater pumping, such as that contemplated for the Project, has the potential to further increase subsidence in the Antelope Valley.[178]

The DEIR does not make a finding, based on substantial evidence, regarding whether any additional pumping is potentially significant. Because DRP has not answered this question, the information and analysis in the DEIR regarding the effect of the Project's proposed pumping is inadequate. DRP must provide an adequate analysis of the Project's impacts to the Antelope Valley Groundwater Basin in a revised DEIR, and recirculate the revised DEIR for public review and comment in accordance with CEQA. -71

VI. THE DEIR FAILS TO DESCRIBE EFFECTIVE MITIGATION MEASURES FOR EACH SIGNIFICANT ENVIRONMENTAL IMPACT

An EIR must propose and describe mitigation measures sufficient to minimize the significant adverse environmental impacts identified in the EIR.[179] Also, mitigation measures must be designed to minimize, reduce or avoid an identified environmental impact or to rectify or compensate for that impact.[180] Where several mitigation measures are available to mitigate an impact, each should be discussed and the basis for selecting a particular measure should be identified.[181] A lead agency may not make the required CEQA findings unless the administrative record clearly shows that all uncertainties regarding the mitigation of significant environmental impacts have been resolved. In this regard, DRP's administrative record is clearly deficient. -72

In particular, CEQA requires the lead agency to adopt feasible mitigation measures that will substantially lessen or avoid the Project's potentially significant environmental impacts and describe those mitigation measures in the EIR.[182] A public agency may not rely on mitigation measures of uncertain efficacy or

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[177] Attachment A (Comments of Matthew Hagemann), p. 4; *see generally*, Attachment G.
[178] Attachment A (Comments of Matthew Hagemann), p. 4
[179] Pub. Res. Code, §§ 21002.1(a), 21100(b)(3).
[180] CEQA Guidelines, § 15370.
[181] CEQA Guidelines, § 15126.4(a)(1)(B).)
[182] Pub. Resources Code §§ 21002, 21081(a), 21100(b)(3); CEQA Guidelines § 15126.4.

feasibility.[183] Mitigation measures must also be fully enforceable through permit conditions, agreements or other legally binding instruments.[184]

Here, the DEIR lacks effective mitigation for several categories of impacts. In addition, the DEIR generally provides only conclusory discussions regarding the effectiveness of mitigation measures. Additional mitigation measures must be included in the DEIR, and the revised measures must be recirculated for public review. -72

A. The DEIR Fails to Minimize the High Risk of Worker Exposure to Valley Fever

The mitigation measures proposed to mitigate the significant risk of worker exposure to Valley Fever fail to address the high risk of exposure at the Project site. The DEIR should also require health surveillance on the Project site to enhance the likelihood of early detection, as recommended by federal regulatory guidelines.[185] -73

B. The DEIR Fails to Require a Comprehensive Weed Management Plan and to Mitigate for Potentially Significant Impacts of Herbicide Use

The DEIR fails to include, or require, a Comprehensive Weed Management Plan.[186] The Applicant proposes to use herbicides, such as Round-Up, which is manufactured by the Monsanto Company to control vegetation on the Project site.[187] The DEIR stats that "herbicides would be used in accordance with manufacturer's recommendations and would not be used within 100 feet of ephemeral Drainages A and C or within the development setbacks for Drainages B and D on the site."[188] DRP finds no potentially significant impacts to surface water runoff as a result of the selective use of herbicides.[189] However, the DEIR also indicates that herbicides such as Round-Up, would also be used to control vegetation within the 100 foot fire -74

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[183] *Kings County Farm Bureau, supra*, 221 Cal.App.3d at 727 ([finding groundwater purchase agreement inadequate mitigation measure because no record evidence existed that replacement water was available].)
[184] *Id.* at § 15126.4(a)(2).
[185] *See* Attachment I (Office of Health and Safety, U.S. Department of Energy, Safety Advisory: Valley Fever).
[186] See Comments of Jim Cornett, Attachment B, p.7.
[187] DEIR, p. 5.5-16.
[188] *Id.*
[189] *Id.*

breaks that are proposed for the perimeter of the Project site.[190] Round-Up herbicide has been shown to be slightly to moderately toxic in aquatic studies.[191] The DEIR fails to evaluate and prescribe mitigation measure to limit the use of herbicides where the perimeter firebreaks intersect offsite drainage.[192]

Although the DEIR proposes to mitigate for Project impacts to water quality through a Stormwater Pollution Prevention Plan (SWPPP) that will be prepared for the Project, and through compliance with the Applicant's proposed Drainage Plan, neither document addresses herbicide use. Under the NPDES program, the SWPPP addresses certain regulated toxics, but to the exclusion of the active ingredient in Round –Up. The proposed Drainage Plan also does not mitigate for this impact because it does not cover construction activities and is intended only to address stormwater flows. -74

C. The DEIR Fails to Adequate Mitigate for the Loss of Joshua Tree Woodland on the Project Site

The entire Project site was formerly Joshua Tree Woodland prior to conversion to agriculture.[193] Joshua Tree Woodland is returning to the Project site now that agricultural activities have ceased.[194] Because of this clear sign of re-establishment, the entire Project site is Joshua Tree Woodland habitat in the process of recovering.[195] -75

The DEIR proposes preserving an isolated 100 acres on the Project site to mitigate for the loss of Joshua Tree Woodland. However, this mitigation measure does not adequately minimize impacts to Joshua Tree Woodland.[196] Mitigation must focus on the entire Project site: the 2,100 acres of recovering Joshua Tree Woodland that will be lost as a result of the Project.[197] -76

Mitigation for impacts to Joshua Tree Woodland should assume that 2,100 acres of Woodland habitat is being lost, not just the few acres where Joshua trees

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[190] DEIR, pp. 5.5-17, 5.6-20.
[191] Attachment J (Material Safety Data Sheet Roundup Original Herbicide).
[192] *See* DEIR, Fig. 4.4-1A.
[193] Attachment B (Comments of Jim Cornett), p. 8.
[194] *Id.*
[195] *Id.*
[196] Attachment B (Comments of Jim Cornett), p.8.
[197] *Id.*

have re-established at this moment in time. Mitigation ratios for the loss of this habitat should be at least 0.5 to 1 based upon accepted standards.[198] -76

D. The DEIR Fails to Require Adequate Mitigation for Impacts to Special Status Species

DRP recommends 450 acres of compensation for the loss of approximately 2,100 acres of Blainville's horned lizard, horned lark, western meadowlark, western burrowing owl, greater roadrunner, lark sparrow, prairie falcon, loggerhead shrike, Joshua tree and possibly the Mohave ground squirrel and desert tortoise, habitat. DRP provides no rationale for this ratio of compensation and, as such, the ratio is arbitrary. The proposed ratio of compensation fails to adequately compensate for the loss of native habitat, because it is not based on substantial evidence. -77

A 1:1 ratio is typically applied wherever there are direct impacts to sensitive species.[199] Direct impacts on the Project site include the loss of 2,100 acres of native habitat.[200] The actual direct area of impact is even larger when offsite impacts and temporary impacts along the transmission line corridor are also considered.[201] The Applicant must demonstrate that the mitigation acreage acquired will actually provide suitable habitat for these species and that the lands will be protected. At the very least, replacement mitigation must require 1 acre for every 1 acre impacted, or greater, because of the large number of sensitive species impacted by this project, which each require mitigation under CEQA.[202]

VII. DRP FAILED TO PREPARE AN ADEQUATE WATER SUPPLY ASSESSMENT FOR THE PROJECT

The California Legislature has declared that the availability of water supply is a critical planning consideration in any new development project. In adopting Senate Bill 610 ("SB 610"), the Legislature amended the Water Code to ensure that there is a direct relationship between land use decisions and water supply.[203] Pursuant to SB 610, the DEIR must determine if existing and projected water -78

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[198] *Id.*
[199] *Id.*
[200] *Id.*
[201] *Id.*
[202] *Id.*
[203] Wat. Code §§ 10910, 10912.

sources are sufficient for anticipated Project demands. SB 610 requires that a "Water Supply Assessment" be prepared to assess water supply for various types of projects prior to development. The Water Supply Assessment must then be included and incorporated in any CEQA documentation prepared for the project.[204]

SB 610 requires either the WSA to determine whether the Project's demand was included in the city or County's most recent Urban Water Management Plan ("UWMP").[205] If the demand was included in the UWMP, the lead agency may incorporate information from the UWMP in preparing the required elements of the assessment. (Water Code § 10910, subd. (c)(2).)

Where an updated UWMP is not available, SB 610 states that the following elements must be included in the Water Supply Assessment:

1. Discussion with regard to whether the public water system's total projected water supplies available during normal, single dry, and multiple dry water years during a 20-year projection will meet the projected water demand associated with the proposed project, and
2. Discussion of the public water system's existing and planned future uses, including agricultural and manufacturing uses.[206]

Before reaching an answer, the WSA must also, through current documentation, identify the existing entitlements, rights, or contracts relevant to the identified water supply for the proposed project.[207] This identification must be demonstrated by providing specific information, including the following:

1. information related to written contracts or other proof of entitlement to an identified water supply;

2. copies of a capital outlay program for financing the delivery of a water supply that has been adopted by the public water system;

3. federal, state, and local permits for construction of necessary infrastructure associated with delivering the water supply; and

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[204] Wat. Code, § 10911(b).
[205] Wat. Code § 10910(c)(1).
[206] Wat. Code § 10910(c).
[207] Wat. Code, § 10910(d)(2).

4. any necessary regulatory approvals that are required in order to be able to convey or deliver the water supply.

DRP has included its WSA for the Project in Section 5.14 of the DEIR.[208] Under SB 610, DRP's WSA must include documentation, identifying the existing entitlements, rights, or contracts relevant to the identified water supply for the proposed Project. The DEIR fails to provide written contracts or other proof of entitlement to an identified water supply for the Project. Therefore, the WSA fails to meet the requirements set forth in SB 610. -78

DRP must provide an adequate WSA in a revised DEIR, and recirculate the revised DEIR for public review and comment in accordance with CEQA.

VIII. THE DEIR MUST BE REVISED AND RECIRCULATED FOR PUBLIC REVIEW AND COMMENT

The DEIR must be revised to adequately analyze and address the Project's impacts and must be re-circulated for public review. CEQA requires re-circulation of an EIR when significant new information is added to the EIR following public review but before certification. (Pub. Res. Code § 21092.1; see also CEQA Guidelines, § 15088.5.) The CEQA Guidelines clarify that new information is significant if "the EIR is changed in a way that deprives the public of a meaningful opportunity to comment upon a substantial adverse environmental effect of the project" including, for example, "a disclosure showing that ... [a] new significant environmental impact would result from the project." (CEQA Guidelines, § 15088.5.) -79

As thoroughly discussed above and in the attached comments, the DEIR fails to include significant information regarding the Project's potentially significant impacts to air quality, biological resources, groundwater resources, soil contamination and visual resources at the Project site. These impacts must be thoroughly addressed in a revised DEIR that is re-circulated for public review. New

[208] *See* DEIR, Appendix J.2.

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and revised mitigation measures feasible of reducing impacts to a less than significant level must also be described in the revised DEIR prior to recirculation. -79-

Sincerely,

Elizabeth Klebaner

EK:bh

Attachments

ORG-3A

Attachment A

ORG-3A

SWAPE Technical Consultation, Data Analysis and Litigation Support for the Environment

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July 29, 2010

Elizabeth Klebaner
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Subject: Comments on the Proposed AV Solar Ranch One Project

Dear Ms. Klebaner:

I have reviewed the June 2010 Draft Environmental Impact Report (DEIR) for the proposed (Project), including the Appendices provided with the DEIR, and have conducted my own research to evaluate Project impacts. The Project is located in Antelope Valley, in unincorporated Los Angeles County, approximately 15 miles northwest of downtown Lancaster, California. The Project will involve the construction of PV panel arrays, an electrical substation, a 20,000 square foot Operations and Maintenance building, and a 4.25 mile-long, 230-kilovolt transmission line for interconnecting the electrical output of the Project to the grid. The comments that follow pertain to sections of the DEIR that include Environmental Safety, Visual Quality, and Utility Services. ORG-3A-1

I. Hazardous Materials Have Not Been Adequately Assessed

Two Phase I Environmental Site Assessments (Phase Is) have been recently prepared for the Project site.[1] Phase Is are routinely prepared to assess potential environmental hazards associated with lands undergoing transfer or change in use. Phase Is are conducted to identify conditions indicative of releases of hazardous substances and involve a review of all known sites in the vicinity of the subject property that are on regulatory agency databases undergoing assessment or cleanup activities, an inspection, and interviews with people knowledgeable about the property. Phase Is conclude with identification of any "recognized environmental conditions" (RECs) and recommendation to address such conditions. -2

The DEIR describes the RECs from the Phase Is as follows (p. 5.15-8):

[1] Phase I Environmental Site Assessment for the NextLight Larsen Ranch Site, URS, July 18, 2008; Phase I Environmental Site Assessment, Larsen Ranch, Michael Brandman Associates, June 28, 2007.

- Approximately 200 square feet of near-surface soil hydrocarbon contamination near four aboveground fuel storage tanks was observed within the 27-acre ranch area during a previous Phase I ESA conducted in 2007 (Michael Brandman Associates 2007).

- Based on the use of hazardous materials and potential waste disposal on the ranch area of the property, there is a potential for impacts to the subsurface of the property at the ranch property.

- The existence of an on-site abandoned oil well was documented on the California Division of Oil, Gas, and Geothermal Resources (DOGGR) database. This well is reportedly located along 160th Street West between West Avenue C and West Avenue C12. The exact location of the oil well could not be verified.

To address the RECs, the DEIR includes Mitigation Measure 5.15-1, as follows (DEIR, p. 5.15-20):

> Additional assessment, and possibly remediation, of potentially contaminated soils on the Project site. Prior to the issuance of a grading permit, the Applicant shall obtain a site closure letter from the Los Angeles County Fire Department, Health Hazardous Materials Division. The Applicant shall conduct additional site assessment or remediation activities as required by and to the satisfaction of the Voluntary Oversight Program of the CUPA (Los Angeles County Fire Department, Health Hazardous Materials Division). Additional assessment and/or remediation may include the following:
>
> 1) Preparation of applicable Phase II Environmental Site Assessment Work Plans that describe the proposed approach and methods to be used in characterizing shallow soils. The Work Plans shall include the proposed sampling locations, sample collection procedures, analytical methods, quality control measures, and a site-specific health and safety plan. The Phase II ESA(s) shall be submitted to the CUPA for regulatory review and approval.
>
> 2) Implementation of the Phase II ESA Work Plan(s) with CUPA oversight.

-2

However, the DIER fails to dully disclose the environmental conditions described in the Phase Is. The 2007 Phase I ESA prepared by Michael Brandman Associates includes the following recommendation (p. 2):

> Soil sampling within the 80 acres south of the occupied/ranch headquarters area, used since the previous testing to grow onions, should be conducted to confirm that no further action under federal or state guidelines is required.

-3

The July 18, 2008 Phase I ESA prepared by URS provides this description of the area used to grow onions:

> According to the 2007 Phase I ESA, soil testing conducted as part of a previous investigation in 1989, indicated that there were no residuals or pesticides of other

> chemicals in concentrations from historic agricultural use for dry grains and alfalfa that would require further action under federal or state guidelines (Michael Brandman Associates 2007). However, according to the 2007 Phase I ESA, the area south of the ranch area was used to grow onions and pesticide use continued on this area following the 1989 testing.

-3

The DEIR states that onion farming continued through 2004 on the 80-acre tract (DEIR, p. 5.9-4). A number of pesticides are currently known to be used in onion farming, including Diazinon, Metam potassium, Metam-sodium, and 1,3-Dichloropropene.[2]

The recommendation made by Michael Brandman in the 2007 Phase I was not referenced in the DEIR. There is also no evidence to suggest that sampling has been conducted in the area where onions were grown. The DEIR also fails to disclose the types of pesticides that could have potentially been used on the site for onion cultivation.

-4

Additionally, the 2008 Phase I recommended a Phase II Environmental Site Assessment to be performed on the property in order to assess the potential for subsurface impacts from the potential historical use of hazardous materials in association with the ranch site. The Phase II, which involves the collection of samples, was recommended to address the stained soil near four aboveground fuel tanks, hazardous materials and potential waste disposal at the ranch property, and an on-site abandoned oil well.

-5

II. Potentially Significant Impacts of Groundwater Extraction Within the Antelope Valley Groundwater Basin

No confirmed source of water for the Project was identified in the DEIR. Groundwater from on-site wells has been identified as a proposed source of water during construction and operation (DEIR, p. 5.14-11). Alternatively, the DEIR discusses obtaining groundwater for Project operations from private landowners and public water suppliers or from payment of an assessment to a yet-to-be named Watermaster for the Basin. The DEIR also discusses meeting the water demand for Project operation by purchasing and trucking fresh or reclaimed water from sources in the general Palmdale/Lancaster area to include wholesalers, retailers, or recycled water suppliers (DEIR p. 5.14-14).

-6

The terms of a potential assessment with a Watermaster are described in the DEIR as follows (p. 5.14-16):

> … the non potable water demand can be met with hauled water. With respect to potable water demand, it is anticipated that a Watermaster will be charged with monitoring the health of the basin. In doing so, a typical Watermaster would create a mechanism for an "assessment" for water pumped over the baseline authorized by the Adjudication. In this case, the Applicant would pay the Watermaster for the 2 AFY shortfall. The Watermaster could then take these funds and purchase replacement water from outside the Basin to offset the overdraft.

-7

[2] http://www.pesticideinfo.org/DS.jsp?sk=14011.

Pumpage of groundwater in the Antelope Valley has lead to widespread ground subsidence.[3] As of 1992, 292 square miles of Antelope Valley had subsided more than one foot.[4] The subsidence permanently reduced aquifer-system storage by about 50,000 acre-feet.[5] Groundwater pumping has caused subsidence of the ground surface as well as earth fissures to appear in Lancaster and on Edwards Air Force Base.[6] -8

The DEIR states that the percentage withdrawal of water for the Project is small, when compared to estimates of sustainable yield in the Antelope Valley Groundwater Basin, stating (DEIR, p. 5.14-21):

> The impacts of the proposed Project's minimal groundwater use of 150 AFY and 12 AFY during the construction and operations phases (i.e., about 0.18 and 0.01 percent, respectively, of the estimated total sustainable yield of 82,300 AFY for the Basin [LACDPW 2010]) would not be cumulatively considerable. -9

This determination, however, is not made in reliance on current groundwater use conditions on the Project site, which are estimated in the DEIR to be at 1 AFY.

Ground subsidence in the Antelope Valley has resulted from groundwater withdrawal. Therefore, any groundwater pumping, such as that contemplated for the Project, has the potential to further increase subsidence in the Antelope Valley. -10

III. Potentially Significant Impacts to Visual Resources Have Not Been Adequately Evaluated

I have reviewed visual resources and have prepared comments for projects under review before the California Energy Commission, including the Ivanpah Project, the Carrizo Project and the SES Solar Two Project. These projects have been proposed to produce approximately 175 to 750 MW of power. -11

The DEIR provides visual simulations from five locations or key observation points (KOPs) (Figure 5.10-1A from the DEIR).

No documentation on how the post-construction KOP simulations (Figures 5.10-4 to 5.10-13) were created was provided in the DEIR. Typically, documentation on key observation points includes software used to create the images, the camera aperture, focal length, camera height and other factors that would affect the quality of the rendered image. Without the data, the accuracy of the rendered image is uncertain. The DEIR should be revised to provide data on the KOP simulations and to provide a narrative on the suitability of the rendered images in providing an accurate portrayal of the visual impacts. -12

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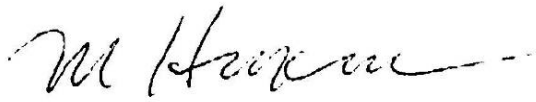
[3] http://ca.water.usgs.gov/groundwater/poland, http://www.water.ca.gov/pubs/groundwater/bulletin_118/basindescriptions/6-44.pdf.
[4] Ibid.
[5] Ibid.
[6] Ibid.

A revised DEIR should be prepared to include two simulated images from a KOP 1 along State Highway 138 at a location amidst the panel array. The simulated view from KOP 1 (Figure 5.10-5) is inadequate in simulating a "worst case" motorist viewpoint because the perspective does not simulate views to the north and south of the panel arrays. Therefore, at least two images from KOP 1 should be generated to simulate a motorist's view on State Highway 138 to the north and to the south. -13

Simulated images were included in the DEIR for KOPs that include the Antelope Valley California Poppy Reserve and the Arthur B. Ripley Desert Woodland State Park. However, a simulated post-construction image was not prepared for a KOP at the Fairmont/Antelope Buttes area, managed by the Santa Monica Mountains Conservancy, and located less than a half-mile from the Project. KOP 3, prepared for the Antelope Valley California Poppy Reserve, is more than two miles from the Project and is therefore not representative of the view from the Fairmont/Antelope Buttes area, a location with potential recreational value. A revised DEIR should be prepared to include a simulated image from the Fairmont/Antelope Buttes area representative of the viewpoint of a hiker overlooking the Project. 14

Sincerely,



Matt Hagemann, P.G.

SWAPE Technical Consultation, Data Analysis and Litigation Support for the Environment

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Matthew F. Hagemann, P.G.

Geologic and Hydrogeologic Characterization
Investigation and Remediation Strategies
Regulatory Compliance
CEQA Review
Expert Witness

Education:

M.S. Degree, Geology, California State University Los Angeles, Los Angeles, CA, 1984.
B.A. Degree, Geology, Humboldt State University, Arcata, CA, 1982.

Professional Certification:

California Professional Geologist, License Number 8571.

Professional Experience:

Matt has 25 years of experience in environmental policy, assessment and remediation. He spent nine years with the U.S. EPA in the RCRA and Superfund programs and served as EPA's Senior Science Policy Advisor in the Western Regional Office where he identified emerging threats to groundwater from perchlorate and MTBE. While with EPA, Matt also served as a Senior Hydrogeologist in the oversight of the assessment of seven major military facilities undergoing base closure. He led numerous enforcement actions under provisions of the Resource Conservation and Recovery Act (RCRA) while also working with permit holders to improve hydrogeologic characterization and water quality monitoring.

Matt has worked closely with U.S. EPA legal counsel and the technical staff of several states in the application and enforcement of RCRA, Safe Drinking Water Act and Clean Water Act regulations. Matt has trained the technical staff in the States of California, Hawaii, Nevada, Arizona and the Territory of Guam in the conduct of investigations, groundwater fundamentals, and sampling techniques.

Positions Matt has held include:

- Founding Partner, Soil/Water/Air Protection Enterprise (SWAPE) (2003 – present);
- Senior Environmental Analyst, Komex H2O Science, Inc (2000 -- 2003);
- Executive Director, Orange Coast Watch (2001 – 2004);
- Senior Science Policy Advisor and Hydrogeologist, U.S. Environmental Protection Agency (1989–1998);
- Hydrogeologist, National Park Service, Water Resources Division (1998 – 2000);

- Adjunct Faculty Member, San Francisco State University, Department of Geosciences (1993 – 1998);
- Instructor, College of Marin, Department of Science (1990 – 1995);
- Geologist, U.S. Forest Service (1986 – 1998); and
- Geologist, Dames & Moore (1984 – 1986).

Senior Regulatory and Litigation Support Analyst:

With SWAPE, Matt's responsibilities have included:

- Manager of a project to evaluate numerous formerly used military sites in the western U.S.
- Manager of a project to provide technical assistance to a comunity adjacent to a former Naval shipyard under a grant from the U.S. EPA.
- Lead analyst in the review of numerous environmental impact reports under CEQA that identify significant issues with regard to hazardous waste, water resources, water quality, air quality, greenhouse gas emissions and geologic hazards.
- Lead analyst in the review of environmental issues in license applications for large solar power plants before the California Energy Commission.
- Stormwater analysis, sampling and best management practice evaluation at industrial facilities.
- Technical assistance and litigation support for vapor intrusion concerns.
- Manager of a comprehensive evaluation of potential sources of perchlorate contamination in Southern California drinking water wells.
- Manager and designated expert for litigation support under provisions of Proposition 65 in the review of releases of gasoline to sources drinking water at major refineries and hundreds of gas stations throughout California.
- Expert witness on two cases involving MTBE litigation.
- Expert witness and litigation support on the impact of air toxins and hazards at a school.
- Expert witness in litigation at a former plywood plant.

With Komex H2O Science Inc., Matt's duties included the following:

- Senior author of a report on the extent of perchlorate contamination that was used in testimony by the former U.S. EPA Administrator and General Counsel.
- Senior researcher in the development of a comprehensive, electronically interactive chronology of MTBE use, research, and regulation.
- Senior researcher in the development of a comprehensive, electronically interactive chronology of perchlorate use, research, and regulation.
- Senior researcher in a study that estimates nationwide costs for MTBE remediation and drinking water treatment, results of which were published in newspapers nationwide and in testimony against provisions of an energy bill that would limit liability for oil companies.
- Research to support litigation to restore drinking water supplies that have been contaminated by MTBE in California and New York.
- Expert witness testimony in a case of oil production-related contamination in Mississippi.
- Lead author for a multi-volume remedial investigation report for an operating school in Los Angeles that met strict regulatory requirements and rigorous deadlines.
- Development of strategic approaches for cleanup of contaminated sites in consultation with clients and regulators.

Executive Director:

As Executive Director with Orange Coast Watch, Matt led efforts to restore water quality at Orange County beaches from multiple sources of contamination including urban runoff and the discharge of wastewater. In reporting to a Board of Directors that included representatives from leading Orange County universities and businesses, Matt prepared issue papers in the areas of treatment and disinfection of wastewater and control of the dischrge of grease to sewer systems. Matt actively participated in the development of countywide water quality permits for the control of urban runoff and permits for the discharge of wastewater. Matt worked with other nonprofits to protect and restore water quality, including Surfrider, Natural Resources Defense Council and Orange County CoastKeeper as well as with business institutions including the Orange County Business Council.

Hydrogeology:

As a Senior Hydrogeologist with the U.S. Environmental Protection Agency, Matt led investigations to characterize and cleanup closing military bases, including Mare Island Naval Shipyard, Hunters Point Naval Shipyard, Treasure Island Naval Station, Alameda Naval Station, Moffett Field, Mather Army Airfield, and Sacramento Army Depot. Specific activities were as follows:

- Led efforts to model groundwater flow and contaminant transport, ensured adequacy of monitoring networks, and assessed cleanup alternatives for contaminated sediment, soil, and groundwater.
- Initiated a regional program for evaluation of groundwater sampling practices and laboratory analysis at military bases.
- Identified emerging issues, wrote technical guidance, and assisted in policy and regulation development through work on four national U.S. EPA workgroups, including the Superfund Groundwater Technical Forum and the Federal Facilities Forum.

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At the request of the State of Hawaii, Matt developed a methodology to determine the vulnerability of groundwater to contamination on the islands of Maui and Oahu. He used analytical models and a GIS to show zones of vulnerability, and the results were adopted and published by the State of Hawaii and County of Maui.

As a hydrogeologist with the EPA Groundwater Protection Section, Matt worked with provisions of the Safe Drinking Water Act and NEPA to prevent drinking water contamination. Specific activities included the following:

- Received an EPA Bronze Medal for his contribution to the development of national guidance for the protection of drinking water.
- Managed the Sole Source Aquifer Program and protected the drinking water of two communities through designation under the Safe Drinking Water Act. He prepared geologic reports, conducted public hearings, and responded to public comments from residents who were very concerned about the impact of designation.
- Reviewed a number of Environmental Impact Statements for planned major developments, including large hazardous and solid waste disposal facilities, mine reclamation, and water transfer.

Matt served as a hydrogeologist with the RCRA Hazardous Waste program. Duties were as follows:

- Supervised the hydrogeologic investigation of hazardous waste sites to determine compliance with Subtitle C requirements.
- Reviewed and wrote "part B" permits for the disposal of hazardous waste.
- Conducted RCRA Corrective Action investigations of waste sites and led inspections that formed the basis for significant enforcement actions that were developed in close coordination with U.S. EPA legal counsel.
- Wrote contract specifications and supervised contractor's investigations of waste sites.

With the National Park Service, Matt directed service-wide investigations of contaminant sources to prevent degradation of water quality, including the following tasks:

- Applied pertinent laws and regulations including CERCLA, RCRA, NEPA, NRDA, and the Clean Water Act to control military, mining, and landfill contaminants.
- Conducted watershed-scale investigations of contaminants at parks, including Yellowstone and Olympic National Park.
- Identified high-levels of perchlorate in soil adjacent to a national park in New Mexico and advised park superintendent on appropriate response actions under CERCLA.
- Served as a Park Service representative on the Interagency Perchlorate Steering Committee, a national workgroup.
- Developed a program to conduct environmental compliance audits of all National Parks while serving on a national workgroup.
- Co-authored two papers on the potential for water contamination from the operation of personal watercraft and snowmobiles, these papers serving as the basis for the development of nation-wide policy on the use of these vehicles in National Parks.
- Contributed to the Federal Multi-Agency Source Water Agreement under the Clean Water Action Plan.

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Policy:

Served senior management as the Senior Science Policy Advisor with the U.S. Environmental Protection Agency, Region 9. Activities included the following:

- Advised the Regional Administrator and senior management on emerging issues such as the potential for the gasoline additive MTBE and ammonium perchlorate to contaminate drinking water supplies.
- Shaped EPA's national response to these threats by serving on workgroups and by contributing to guidance, including the Office of Research and Development publication, Oxygenates in Water: Critical Information and Research Needs.
- Improved the technical training of EPA's scientific and engineering staff.
- Earned an EPA Bronze Medal for representing the region's 300 scientists and engineers in negotiations with the Administrator and senior management to better integrate scientific principles into the policy-making process.
- Established national protocol for the peer review of scientific documents.

Geology:

With the U.S. Forest Service, Matt led investigations to determine hillslope stability of areas proposed for timber harvest in the central Oregon Coast Range. Specific activities were as follows:

- Mapped geology in the field, and used aerial photographic interpretation and mathematical models to determine slope stability.

- Coordinated his research with community members who were concerned with natural resource protection.
- Characterized the geology of an aquifer that serves as the sole source of drinking water for the city of Medford, Oregon.

As a consultant with Dames and Moore, Matt led geologic investigations of two contaminated sites (later listed on the Superfund NPL) in the Portland, Oregon, area and a large hazardous waste site in eastern Oregon. Duties included the following:

- Supervised year-long effort for soil and groundwater sampling.
- Conducted aquifer tests.
- Investigated active faults beneath sites proposed for hazardous waste disposal.

Teaching:

From 1990 to 1998, Matt taught at least one course per semester at the community college and university levels:

- At San Francisco State University, held an adjunct faculty position and taught courses in environmental geology, oceanography (lab and lecture), hydrogeology, and groundwater contamination.
- Served as a committee member for graduate and undergraduate students.
- Taught courses in environmental geology and oceanography at the College of Marin.

Invited Testimony, Reports, Papers and Presentations:

Hagemann, M.F., 2008. Disclosure of Hazardous Waste Issues under CEQA. Presentation to the Public Environmental Law Conference, Eugene, Oregon.

Hagemann, M.F., 2008. Disclosure of Hazardous Waste Issues under CEQA. Invited presentation to U.S. EPA Region 9, San Francisco, California.

Hagemann, M.F., 2005. Use of Electronic Databases in Environmental Regulation, Policy Making and Public Participation. Brownfields 2005, Denver, Coloradao.

Hagemann, M.F., 2004. Perchlorate Contamination of the Colorado River and Impacts to Drinking Water in Nevada and the Southwestern U.S. Presentation to a meeting of the American Groundwater Trust, Las Vegas, NV (served on conference organizing committee).

Hagemann, M.F., 2004. Invited testimony to a California Senate committee hearing on air toxins at schools in Southern California, Los Angeles.

Brown, A., Farrow, J., Gray, A. and **Hagemann, M.**, 2004. An Estimate of Costs to Address MTBE Releases from Underground Storage Tanks and the Resulting Impact to Drinking Water Wells. Presentation to the Ground Water and Environmental Law Conference, National Groundwater Association.

Hagemann, M.F., 2004. Perchlorate Contamination of the Colorado River and Impacts to Drinking Water in Arizona and the Southwestern U.S. Presentation to a meeting of the American Groundwater Trust, Phoenix, AZ (served on conference organizing committee).

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Hagemann, M.F., 2003. Perchlorate Contamination of the Colorado River and Impacts to Drinking Water in the Southwestern U.S. Invited presentation to a special committee meeting of the National Academy of Sciences, Irvine, CA.

Hagemann, M.F., 2003. Perchlorate Contamination of the Colorado River. Invited presentation to a tribal EPA meeting, Pechanga, CA.

Hagemann, M.F., 2003. Perchlorate Contamination of the Colorado River. Invited presentation to a meeting of tribal repesentatives, Parker, AZ.

Hagemann, M.F., 2003. Impact of Perchlorate on the Colorado River and Associated Drinking Water Supplies. Invited presentation to the Inter-Tribal Meeting, Torres Martinez Tribe.

Hagemann, M.F., 2003. The Emergence of Perchlorate as a Widespread Drinking Water Contaminant. Invited presentation to the U.S. EPA Region 9.

Hagemann, M.F., 2003. A Deductive Approach to the Assessment of Perchlorate Contamination. Invited presentation to the California Assembly Natural Resources Committee.

Hagemann, M.F., 2003. Perchlorate: A Cold War Legacy in Drinking Water. Presentation to a meeting of the National Groundwater Association.

Hagemann, M.F., 2002. From Tank to Tap: A Chronology of MTBE in Groundwater. Presentation to a meeting of the National Groundwater Association.

Hagemann, M.F., 2002. A Chronology of MTBE in Groundwater and an Estimate of Costs to Address Impacts to Groundwater. Presentation to the annual meeting of the Society of Environmental Journalists.

Hagemann, M.F., 2002. An Estimate of the Cost to Address MTBE Contamination in Groundwater (and Who Will Pay). Presentation to a meeting of the National Groundwater Association.

Hagemann, M.F., 2002. An Estimate of Costs to Address MTBE Releases from Underground Storage Tanks and the Resulting Impact to Drinking Water Wells. Presentation to a meeting of the U.S. EPA and State Underground Storage Tank Program managers.

Hagemann, M.F., 2001. From Tank to Tap: A Chronology of MTBE in Groundwater. Unpublished report.

Hagemann, M.F., 2001. Estimated Cleanup Cost for MTBE in Groundwater Used as Drinking Water. Unpublished report.

Hagemann, M.F., 2001. Estimated Costs to Address MTBE Releases from Leaking Underground Storage Tanks. Unpublished report.

Hagemann, M.F., and VanMouwerik, M., 1999. Potential Water Quality Concerns Related to Snowmobile Usage. Water Resources Division, National Park Service, Technical Report.

VanMouwerik, M. and **Hagemann, M.F.** 1999, Water Quality Concerns Related to Personal Watercraft Usage. Water Resources Division, National Park Service, Technical Report.

Hagemann, M.F., 1999, Is Dilution the Solution to Pollution in National Parks? The George Wright Society Biannual Meeting, Asheville, North Carolina.

Hagemann, M.F., 1997, The Potential for MTBE to Contaminate Groundwater. U.S. EPA Superfund Groundwater Technical Forum Annual Meeting, Las Vegas, Nevada.

Hagemann, M.F., and Gill, M., 1996, Impediments to Intrinsic Remediation, Moffett Field Naval Air Station, Conference on Intrinsic Remediation of Chlorinated Hydrocarbons, Salt Lake City.

Hagemann, M.F., Fukunaga, G.L., 1996, The Vulnerability of Groundwater to Anthropogenic Contaminants on the Island of Maui, Hawaii. Hawaii Water Works Association Annual Meeting, Maui, October 1996.

Hagemann, M. F., Fukanaga, G. L., 1996, Ranking Groundwater Vulnerability in Central Oahu, Hawaii. Proceedings, Geographic Information Systems in Environmental Resources Management, Air and Waste Management Association Publication VIP-61.

Hagemann, M.F., 1994. Groundwater Characterization and Cleanup at Closing Military Bases in California. Proceedings, California Groundwater Resources Association Meeting.

Hagemann, M.F. and Sabol, M.A., 1993. Role of the U.S. EPA in the High Plains States Groundwater Recharge Demonstration Program. Proceedings, Sixth Biennial Symposium on the Artificial Recharge of Groundwater.

Hagemann, M.F., 1993. U.S. EPA Policy on the Technical Impracticability of the Cleanup of DNAPL-contaminated Groundwater. California Groundwater Resources Association Meeting.

Hagemann, M.F., 1992. Dense Nonaqueous Phase Liquid Contamination of Groundwater: An Ounce of Prevention... Proceedings, Association of Engineering Geologists Annual Meeting, v. 35.

Other Experience:

Selected as subject matter expert for the California Geologist licensing examination, 2009-2010.

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ORG-3B

Attachment B

ORG-3B

James W. Cornett — Ecological Consultants

July 28, 2010

Elizabeth Klebaner
Adams Broadwell Joseph & Cardozo
601 Gateway Boulevard, Suite 1000
South San Francisco, California 94080-7037

Subject: AV Solar Ranch One Project — Draft Environmental Impact Report

Dear Ms. Klebaner:

Per your request, I have reviewed the Draft Environmental Impact Report (hereinafter the "DEIR") as well as all of the information relevant to biological resources provided in Appendix A-K of the DEIR, for the AV Solar Ranch One Project (hereinafter the "Project") which would be located on private property under the planning jurisdiction of the County of Los Angeles. I have also conducted my own research to evaluate the Project and its potentially significant effects on biological resources. My qualifications to perform this review include thirty years experience as a professional California desert ecologist, hundreds of special-status plant and animal surveys, and twenty years of formal research on Joshua tree population dynamics under permits from the National Park Service. I have both prepared and reviewed nearly one thousand biological resource sections of environmental documents. My professional resume is attached hereto. ORG-3B-1

My comments on the DEIR follow.

I. The DEIR Fails to Provide Adequate Data to Ascertain the Biological Baseline Conditions at the Project Site

The Project site is large and irregular in shape, covering approximately 2,100 acres in unincorporated Los Angeles County. The Project boundary has five, right-angle bends that envelope five non-project areas on two sides (not including drainages).[1] Non-project areas bounded on two or more sides by a development should be surveyed with the same intensity as the Project site itself. The proximity of adjacent lands, when half surrounded by a new project, -2

[1] *See* AV Solar Ranch One County of Los Angeles Draft EIR, Figure 3-1 and Figure 4.4-1A.

can be expected to be severely impacted by Project construction, operation and maintenance activities.[2] As a result, there must be disclosure of the biological resources on these properties, and whether they would be impacted by the Project. It is standard practice to conduct surveys at least 100 yards beyond site boundaries since important biological resources may lie immediately off site. Protocol surveys for the desert tortoise, for example, often involve surveys 800 yards beyond site boundaries.[3] However, there were no biological surveys done beyond the Project site boundaries.[4] Small animals can easily move off and back onto a site in a matter of minutes, certainly in days.[5] Offsite surveys should have been conducted in order to fully evaluate baseline conditions within the Project area of impact. At the very least, a discussion should have been provided in the Biota Report as to why standard practices were abandoned, and offsite surveys were not conducted. -2

In addition to the main power plant facilities, the DEIR fails to provide baseline data regarding the Project's linear facilities. The DEIR and supporting materials fail to provide any information regarding the survey efforts or state whether formal biological studies had been conducted for the portion of the transmission line lying in Kern County, as well as within the area of the proposed Whirlwind substation on which the Project plans to rely. In addition, the DEIR fails to identify and describe the access road or roads that will be needed to install and service the transmission line in both counties. The biological resources existent along the full length of the transmission line, substation, and any related linears, need to be addressed in the DEIR. Additional biological studies may need to be completed if the transmission line and access road corridor occupy an area that is wider than initially described. -3

As a general matter, the surveys that were conducted on the Project site were directed toward birds and plants.[6] All other vertebrate observations were incidental. It is virtually impossible to conduct valid surveys for terrestrial vertebrates while looking upward for birds. -4

The DEIR also fails to adequately address several special-status species that have the potential to occur on the Project site, including Mojave ground squirrel, desert tortoise, Blainville's horned lizard, western burrowing owl, and several special-status plants. -5

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[2] Yahner, R. H. 1988. Changes in wildlife communities near edges. Conservation Biology 2(4):333-339.

[3] Field Survey Protocol for Any Non-Federal Action That May Occur within the Range of the Desert Tortoise, U.S. Fish & Wildlife Service, 1992, page 6.

[4] AV Solar Ranch One Biota Report.

[5] Berry, K. H. 1986. Desert tortoise (*Gopherus agassizii*), relocation: Implications of social behavior and movements. Herpetologica 42:113-125.

[6] AV Solar Ranch One Biota Report, pages 4-66 to 4-67.

ORG-3B

A. The Absence of Mojave Ground Squirrel from Project Site is Unsubstantiated

A review of the DEIR and supporting information reveals that the Applicant has not done focused live-trap surveys for the State-threatened Mohave ground squirrel. The Applicant's Biota Report justifies its decision not to conduct focused surveys for this species because of a single, non-peer reviewed document from the files of the California Department of Fish & Game ("Department"). The document states "although the species likely occupied the Antelope Valley historically, widespread conversion of native habitats has apparently resulted in the extirpation of the species from west of Palmdale and Lancaster speculating that the squirrel is no longer found west of Highway 14."[7] However, the Department provides a conflicting, and more recent, document indicating Mohave ground squirrels are found throughout the Antelope Valley.[8] Reliance upon a non-reviewed or out of date report may be expedient but it is neither professional nor rigorous. A protocol survey, following state guidelines, would provide the best information as to the status of the squirrel within and adjacent to the Project site.[9] Moreover, a survey is required to determine Project impacts because of the likelihood that the species exists on the Project site. -6-

B. Failure to establish baseline conditions for the Desert tortoise

No focused surveys were done for the desert tortoise, a known resident of the Antelope Valley and inhabitant of at least some of the habitats within the project boundaries.[10] In response to the Notice of Preparation issued by the County of Los Angeles on April 29, 2009, the U.S. Fish & Wildlife Service ("USFWS") in an official letter (dated June 16, 2009) recommended that tortoise surveys be conducted.[11] The Service's letter was written and received after the spring tortoise survey season was over on May 31, 2009.[12] Three weeks later, on July 9, 2009, the Service's recommendation for a tortoise survey was rescinded in an email from Ray Bransfield of the USFWS to Crissy Slaughter of URS.[13] However, it appears the USFWS rescission was made without a site visit by a biologist from the Service. This same email, however, -7-

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[7] Laabs, David. 2004. Mojave ground squirrel. Biosearch Wildlife Surveys, PO Box 8043, Santa Cruz, CA 95061. 7 pp.

[8] California Wildlife Habitat Relationships System, California Department of Fish and Game, California Interagency Wildlife Task Group, Mohave Ground Squirrel *Spermophilus mohavensis*, M073, revised 2005.

[9] California Department of Fish and Game. 2003. Mohave ground squirrel survey guidelines. California Department of Fish and Game, Sacramento, California, USA.

[10] California Wildlife Habitat Relationships System, California Department of Fish and Game, California Interagency Wildlife Task Group, Desert Tortoise *Gopherus agassizii* R005.

[11] AV Solar Ranch One County of Los Angeles Draft EIR, Appendix A.2 Notice of Preparation Response Letters, U.S. Fish & Wildlife Service response letter dated June 16, 2009.

[12] Field Survey Protocol for Any Non-Federal Action That May Occur within the Range of the Desert Tortoise, U.S. Fish & Wildlife Service, 1992.

[13] AV Solar Ranch One County of Los Angeles Draft EIR, Appendix A.3 Notice of Preparation Response Letters Received, U.S. Fish & Wildlife Service email response dated July 9, 2010.

recommended that a pre-construction tortoise survey be conducted. The rationale for not conducting tortoise surveys for the environmental review process but requiring pre-construction tortoise surveys after the environmental review process is completed is unique in my experience, and also suggests that USFWS has not ruled out the possibility of presence. Formal surveys for the desert tortoise should have been conducted because there is evidence that the species may be found on the Project site. This is a major deficiency in the DEIR and Biota Report. -7-

C. Failure to establish baseline conditions for the Blainville's horned lizard

No focused surveys were done for Blainville's horned lizard. The species was incidentally observed on the Project site during surveys for plants and birds. As this cryptic species is very difficult to detect in the field, particularly when it is not being sought, a focused survey for this Species of Special Concern would likely provide numerous additional sightings that could change proposed mitigation strategies for the species.[14] For example, the Project proponent recommends the acquisition of 450 off-site acres to mitigate impacts to sensitive species. However, with regard to Blainville's horned lizard, this proposal was based upon the accidental observation of a single lizard. A focused survey would undoubtedly result in the discovery of additional individuals and should result in a re-evaluation of the number of mitigation acres appropriate to protect this species. -8-

D. Special status plant surveys potentially invalidated by drought conditions

Special-status plant surveys were done in 2009 when drought enveloped the Project region.[15] On a project this large that encompasses several habitat types, there should be a special-status plant survey conducted in a year of average or above-average precipitation.[16] The limitations of the Applicant's survey were not even discussed in the section of the Biota Report dealing with sensitive plant species. Examples of sensitive plant species that are most likely to be found on the Project site in a year of average or above average precipitation that were not found in the biological study include: *Abronia villosa* var. *aurita*, *Astragalus hornii* var. *hornii*, *Calochortus striatus*, *Calystegia peirsonii*, *and Canbya candida.*[17] -9-

E. Project features suggest corridor for animal movement exists on Project site

From the photographs provided it can be determined that native, Mojave Desert vegetation (including Joshua trees) abuts the Project site.[18] Such connections indicate there is a natural source and corridor for the movement of animals and dispersal of plants onto the Project -10-

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[14] Stebbins, R. C. 2003. *A field guide to western reptiles and amphibians.* Houghton Mifflin Company, Boston.

[15] AV Solar Ranch One Biota Report, page 4-64.

[16] California Department of Fish & Game. 2000. Guidelines for assessing the effects of proposed projects on rare, threatened, endangered plant and communities.

[17] Tibor, D. P., (editor). 2001. *Inventory of rare and endangered plants of California.* California Native Plant Society, Berkeley, California.

[18] AV Solar Ranch One County of Los Angeles Draft EIR, Figure 5.10-5.

site including desert tortoise, Mohave ground squirrel, Blainville's horned lizard, mariposa lily, etc.[19] Contrary to comments made in the Biota Report, paved roadways are not barriers to dispersal as attested to frequent observations of all categories of wildlife on highways.[20] -10

F. The Project site contains suitable habitat for greater roadrunner

Contrary to comments made in the Biota Report, suitable nesting habitat for the greater roadrunner does exist in and around the Project site.[21] This includes the pistachio orchard and residential structures and accompanying ornamental landscaped areas as described on pages 4-20 and 4-21 in the Biota Report. Surveys should have been conducted within the Project impact area, to identify active nests. Nesting surveys for this species should be done in late April through May.[22] -11

G. Burrowing owl surveys invalidated by time and wind

According to the Biota Report, most of the burrowing owl protocol surveys were done at the wrong time and under adverse conditions.[23] Protocols for burrowing owl surveys clearly state "Conduct these visits from two hours before sunset to one hour after or from one hour before to two hours after sunrise."[24] Protocols also indicate to "avoid surveys during heavy rain, high winds (> 20 mph)." Again, many of the surveys were done on days when wind speed exceeded 20 miles per hour.

From my experience, conducting burrowing owl protocol surveys in desert regions when wind velocities exceed even 12 mph results in the underestimating of burrowing owl utilization of a site. Burrowing owls typically stay low and on the ground or spend more time in their burrows at high wind velocities making them difficult to detect. It is also difficult if not impossible for surveyors to hear burrowing owl calls when it is windy. Seeking burrowing owls during midday is difficult as they can be expected to be hiding in their burrows or beneath other cover. For this reason, it is likely that burrowing owls were underestimated in the census. Therefore, it is impossible to accurately assess impacts, and I recommend new surveys be conducted during appropriate times and weather conditions. -12

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[19] Gilbert-Norton, L., R. Wilson, J. R. Stevens, and K. H. Beard. 2010. A Meta-Analytic Review of Corridor Effectiveness. Conservation Biology 24(3):660-668.

[20] Trombulak, S. C. and C. A. Firssell. 2000. Review of Ecological Effects of Roads on Terrestrial and Aquatic Communities. Conservation Biology 14(1):18-30.

[21] Cornett, J. W. 2001. *The Roadrunner.* Nature Trails Press, Palm Springs, California.

[22] Cornett, J. W. 1983. Early nesting of the roadrunner, *Geococcyx californianus*, in California. American Birds (2):236.

[23] Biota Report, Table 4-1, pages 4-5 to 4-9.

[24] California Burrowing Owl Consortium. 1993. Burrowing Owl Survey Protocol and Mitigation Guidelines.

H. Inadequacy of the survey effort is underscored by Project biologists' absence of adequate knowledge, training and experience

It appears from the information provided by the Applicant, that the biologist that conducted the Project surveys lacks necessary relevant experience. In particular, I have serious concerns regarding the use of a college history major and aquatic biologists, among others, to conduct biological surveys in the Mojave Desert.[25] The dismissing of desert tortoise and Mohave ground squirrel surveys, lack of pit trapping on such a large project site, complete lack of live trapping of any kind, no mention of the effects of below average precipitation, all point to a serious unfamiliarity with desert environments on the part of some personnel. In several instances the Biota Report fails to identify numerous organisms to the species level: two bird species on page J-4 and a kangaroo rat on page J-7. No records or observations were made of any species of pocket mouse or white-footed mouse, groups that most assuredly occur within the Project boundaries.[26] Taken together, these omissions are serious and undermine the validity of many of the findings. -13

II. The DEIR Fails to Evaluate Project Impacts to State Jurisdictional Waters

In my experience, water courses that cut through the heart of a project will be impacted due to construction/grading activities, facility operation and maintenance—no matter how many rules are in place. The very proximity of the Project to the stream courses can be expected to result in serious impacts. The DEIR fails entirely to evaluate potential impacts to jurisdictional waters during construction. For example, the DEIR fails to evaluate the potential for Project personnel to inadvertently dump toxic compounds into the channels or for construction personnel to short cut across streambeds. Failure to evaluate such impacts brings into question the County's determination that 100 foot setbacks can adequately mitigate for Project impacts to state jurisdictional waters. The DEIR also fails to provide any data, opinions of biologists, or other relevant regulatory materials, that suggests that the use of 100 foot setbacks would adequately protect the jurisdictional features on the Project site. The DEIR makes no attempt to evaluate these impacts. -14

III. The DEIR Fails to Evaluate Hazards to Plant and Animal Species as a Result of the Project

As a result of increased perching sites and human activity in and around the Project site, it is likely that raven numbers will increase as well as impacts to potential raven prey species such as Blainville's horned lizard, nestlings of most bird species, Mohave ground squirrels, and, potentially, young desert tortoises. Although there are passing references regarding this issue in -15

[25] Biota Report, page 8-1.

[26] Jameson, E. W. Jr. and H. J. Peeters. 2004. *California mammals.* University of California Press, Berkeley, California.

the biological report and EIR, this issue needs to be thoroughly examined in the report including likely number of new perching sites, new drinking sites as a result of landscape irrigation, and new nesting sites as a result of additional power poles in the area. -15

Grading invites exotic weed species onto the Project site and immediate vicinity.[27] I could find no comprehensive weed control plan and no complete list of herbicides that might be used as control agents. This documentation must have been provided to ensure such hazards will be adequately mitigated. -16

IV. The DEIR Fails to Propose or Require Adequate Mitigation for Impacts to State Jurisdictional Waters

The mitigation proposed in the DEIR fails to reduce and avoid impacts to jurisdictional waters. In order to adequately mitigate for Project impacts to State jurisdictional waters, the Applicant should be required to maintain a minimal 300 feet of clearance from the midline of all identified ephemeral channels, all construction laydown areas and permanent Project features. -17

The DEIR states that a single biological monitor will be onsite immediately prior to and during construction on a 2,000 plus-acre project. In addition, the monitor has dozens of functions, many of which will take him/her offsite. In my opinion, there needs to be a least two, and sometimes three, full-time biological monitors to handle the work load described in the DEIR. Therefore, the Applicant should be required to ensure that at least two biological monitors are on site during all phases of construction to monitor construction activities. -18

I also recommend that the biological monitors be hired and paid by the County of Los Angles to minimize conflicts of interest. The Applicant's biologist should prepare a Drainage Maintenance Plan in consultation with the California Department of Fish and Game, and the Plan should require regular monitoring for the life of the Project to ensure that personnel follow agreed-upon rules and minimize transgressions in or near the channels. -19

V. The DEIR Fails to Propose or Require Adequate Mitigation for Project Impacts to Joshua Tree Woodland

The entire Project site was formerly Joshua Tree Woodland prior to conversion to agriculture.[28] Joshua Tree Woodland is returning to the Project site now that agricultural activities have ceased.[29] Because of this clear sign of re-establishment, it is my opinion that the entire Project site is Joshua Tree Woodland habitat in the process of recovering. Mitigation for impacts to Joshua Tree Woodland should assume that 2,100 acres of Woodland habitat is being lost, not just the few acres where Joshua trees have re-established at this moment in time. -20

[27] Bossard, C. C., J. M. Randall and M. C. Hosbovsky. 2000. *Invasive Plants of California's Wildlands.* University of California Press, Berkeley, California.

[28] AV Solar Ranch One Biota Report, page 3-19.

[29] Ibid., page 4-18.

Mitigation ratios for the loss of this habitat should be at least 0.5 to 1 based upon excepted standards.[30]

There is little value in preserving an isolated 100 acres on the Project site.[31] Mitigation should focus on the big picture—the 2,100 acres of recovering Joshua Tree Woodland. -20

VI. The DEIR Fails to Propose or Require Adequate Mitigation for Project Impacts to Special Status Species

A 1:1 ratio is typically applied wherever there are direct impacts to sensitive species.[32] Direct impacts on the Project site could potentially include the loss of habitat for Blainville's horned lizard, horned lark, western meadowlark, western burrowing owl, greater roadrunner, lark sparrow, prairie falcon, loggerhead shrike, Joshua tree and possibly the Mohave ground squirrel and desert tortoise. The actual direct area of impact is even larger when offsite impacts and temporary impacts along the transmission line corridor are also considered. The Applicant must demonstrate that the mitigation acreage acquired will actually provide suitable habitat for these species and that the lands will be protected. The County's recommended 450 acres of compensation appears to be completely arbitrary. At the very least, replacement mitigation should be 1-to-1 and more likely greater because of the large number of sensitive species impacted by this Project, each requiring mitigation under CEQA. -21

VII. The DEIR Fails to Require Replanting with Native Vegetation

A feeble effort is made in the DEIR to identify the vegetation that the Applicant will use as visual screens for the Project. At a minimum, the DEIR should be revised to identify the scientific names of the plants that will be used. The Applicant should be required to provide a complete list of native plants that will be used for screening visual impacts to the County prior to Project construction. The Applicant should be required to also provide the anticipated source of the native plants so that genetically suitable specimens can be used. -22

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[30] Abengoa Mojave Solar, Supplemental Staff Assessment - Part B, page 5.2-34.

[31] Barrett, S. and J. Kohn. 1991. *Genetic and Evolutionary Consequences of Small Population Size in Plants: Implications for Conservation. In*: Falk, D., and K. Holsinger. eds. *Genetics and Conservation of Rare Plants*. Center for Plant Conservation, Oxford University Press. pp. 3-30.

[32] Palen Solar Power Project, Application for Certification, Application for Certification (09-AFC-7), Staff Assessment and Draft Environmental Impact Statement, pages C.2-2, C.2-65.

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This concludes my comments regarding the findings and recommendations in the DEIR and appendices. -23

Sincerely,

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Attachments:
Curriculum vitae
MGS Distribution Map

JAMES W. CORNETT - CURRICULUM VITAE - 2010

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Education

B.A., Biology, University of California at Riverside, 1976

M.S., Biology, California State University at San Bernardino, 1980

Positions Held

January, 1974 - Present
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January, 1996 – June, 2004
Director of Natural Sciences, Palm Springs Desert Museum, 101 Museum Drive, Palm Springs, California 92263, 760-325-7186.

January, 1980 – December, 1995
Curator of Natural Sciences, Palm Springs Desert Museum

September, 1976 - December, 1979
Assistant Curator of Natural Science, Palm Springs Desert Museum

September, 1975 - June, 1976
Natural Science Instructor, Palm Springs Desert Museum

January, 1973 - Present
Environmental Columnist (weekly), Desert Sun-Gannett Newspapers, P.O. Box 2734, Palm Springs, California 92263.

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January, 1981 - Present
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October, 1975 - June, 1983
Biology and Natural Resources Instructor (part-time), College of The Desert, 43500 Monterey Road, Palm Desert, California 92260, 760-346-8041.

January, 1973 - June, 1974
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Current and Past Professional Affiliations

American Society of Mammalogists
Bureau of Land Management Colorado Desert Advisory Committee
California Botanical Society
California Native Plant Society
Ecological Society of America
Herpetologists League
International Palm Society
Joshua Tree National Park Association, Board Member
Southern California Academy of Sciences
Southern California Botanists
Southwestern Naturalists' Society
Western Field Ornithologists

California Wildlife Habitat Relationships System

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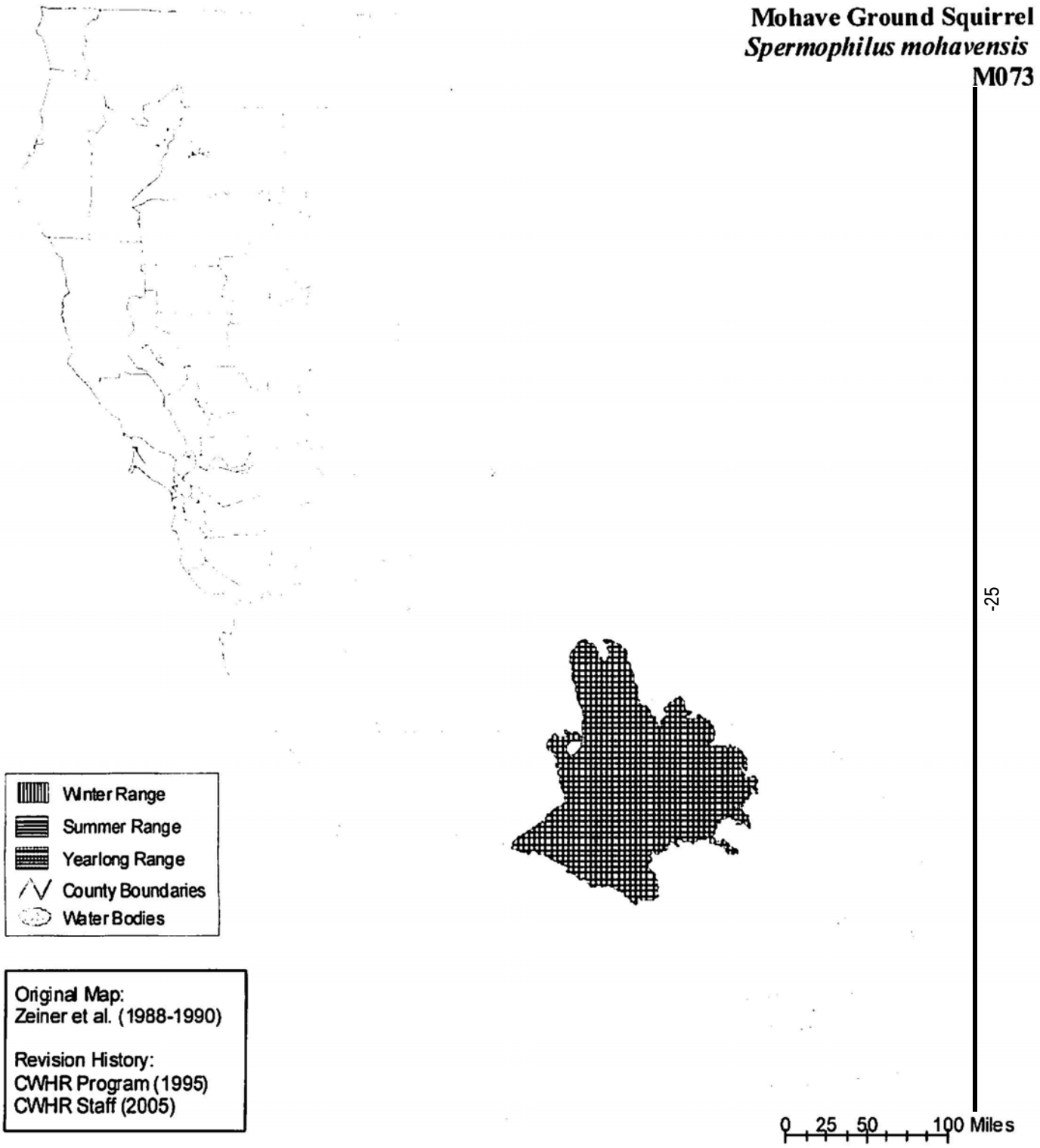
California Department of Fish and Game

California Interagency Wildlife Task Group

Mohave Ground Squirrel
Spermophilus mohavensis
M073



Original Map:
Zeiner et al. (1988-1990)

Revision History:
CWHR Program (1995)
CWHR Staff (2005)

Range maps are based on available occurrence data and professional knowledge. They represent current, but not historic or potential, range. Unless otherwise noted above, maps were originally published in Zeiner, D.C., W.F. Laudenslayer, Jr., K.E. Mayer, and M. White, eds. 1988-1990. California's Wildlife. Vol. I-III. California Depart. of Fish and Game, Sacramento, California. Updates are noted in maps that have been added or edited since original publication.

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Attachment C

HOW MUCH WATER DOES ALFALFA REALLY NEED?

Blaine Hanson, Khaled Bali, Steve Orloff, Blake Sanden, Dan Putnam[1]

ABSTRACT

Evapotranspiration (ET) of fully-irrigated and deficit-irrigated (no irrigation in July, August, and September) was measured in five alfalfa fields at various locations throughout California. Seasonal ET ranged from 33 to 58 inches, which differed from historical seasonal ET. Deficit irrigation reduced ET, but the ET difference between fully-irrigated and deficit-irrigated alfalfa was site specific. Yields were reduced by deficit irrigation.

Keywords: alfalfa, irrigation, evapotranspiration, water use

INTRODUCTION

Alfalfa is California's single largest agricultural water user due to the amount grown, typically about 1 million acres, and its long growing season. Seasonal alfalfa water applications generally range from 4,000,000 to 5,500,000 acre-feet. Because of the high water usage, interest exists in better defining the seasonal water use of fully irrigated alfalfa for different climatic areas of California and in midsummer deficit irrigation (no irrigation in July, August, and September) of alfalfa as a strategy for coping with limited water supplies and also as a strategy for providing water for transfer from water-rich areas such as the Sacramento Valley to water-short areas such as the San Joaquin Valley and southern California. In theory, the amount of water available for transfer is the difference between the ET of fully-and deficit-irrigated alfalfa. This midsummer deficit irrigation strategy maintains the relatively high yields of the first part of the year and eliminates irrigations during the summer when yields are small and quality usually is poor.

Previous studies on mid-summer deficit irrigation of alfalfa showed that no irrigation during the midsummer reduced the alfalfa yield, but did not stop all plant growth (Frate et al., 1991, Guitjens, 1993, Ottman et al., 1996, Putnam et al., 2000, Robinson et al., 1994). As a result, some evapotranspiration occurred during the period of deficit irrigation. No information exists on differences in midsummer evapotranspiration amounts between fully-and deficit-irrigated alfalfa.

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This study investigated the seasonal ET requirements of fully-irrigated alfalfa and the effect of midsummer deficit irrigation on yield and evapotranspiration in commercial alfalfa fields at various locations in California.

METHODS AND MATERIALS

Alfalfa evapotranspiration (ET) was determined at Tulelake (Klamath Basin), Scott Valley (near Yreka in the intermountain area of northern California), Sacramento Valley (near Davis), Kern County (near Buttonwillow), and the Imperial Valley (near Holtville). All sites were commercial fields except for the Tulelake site, which was located at the University of California Intermountain Research and Extension Center, Measurements were made at the Davis site from 2005 to 2008, and at the other sites in 2007 and 2008. The ET was determined using the eddy covariance and surface renewal meteorological methods.

These sites reflect mid-summer climate conditions ranging from warm summer temperatures in the Intermountain areas (Scott Valley, Tulelake) to very hot summer temperatures (Imperial Valley). Border (flood) irrigation was used at the Sacramento Valley, Kern County, and Imperial Valley sites, while sprinkle irrigation was used at the Scott Valley and Tulelake sites, reflecting the irrigation practices of each area. Most of each field was fully irrigated; a section of each field was deficit irrigated during the mid-summer. The fully-irrigated alfalfa was irrigated according to the irrigators' normal practices.

RESULTS AND DISCUSSION

Fully-irrigated Alfalfa Evapotranspiration (ET)

Daily evapotranspiration of alfalfa is small, generally between 0.05 and 0.1 inches per day, at the start of the crop growing season, which varies depending on climate characteristics, increases with time of year to maximum values between 0.3 and 0.4 inches per day in June/July, and then decreases to small values at the end of the crop season, as shown in Figure 1 for Scott Valley, Imperial Valley, and Sacramento Valley sites. The growing season of Scott Valley is smaller than those of the Sacramento and Imperial Valley due to its altitude (2,700 feet) and northerly location. In the Imperial Valley, alfalfa evapotranspiration from July to September in 2007 was affected by possible heat stress, reflected by daily ET values smaller than reference ET values. Similar behavior occurred in the Imperial Valley 2008 growing season (not shown). Daily ET decreased during the harvest, but increased rapidly with time after the first irrigation after harvest, reaching maximum values just before the next harvest.

Seasonal evapotranspiration ranged from 33 inches (Scott Valley 2008) to 58 inches (Imperial Valley 2007) (Table 1). Seasonal ET values of Scott Valley and Tulelake were greater than the historical ET commonly used for crop water use. Seasonal ET of the Sacramento Valley and Kern County sites was slightly higher than the historical ET, with an average of 53 inches for the three year period for the Sacramento Valley. The seasaonal ET of the Imperial Valley was smaller than the historical value, possibly due to the heat stress.

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Table 1. Seasonal ET of the fully-irrigated alfalfa and historical ET for the experimental sites.

Site	Seasonal ET (inches)	Historical ET (inches)
Imperial Valley	58 (2007)	76
Kern County	56(2007)	49
Davis	50 (2005) 54 (2006) 55 (2007)	49
Scott Valley	39 (2007) 33 (2008)	33
Tulelake	41(2007) 35 (2008)	33

Crop Coefficients

Crop ET commonly is estimated by multiplying the CIMIS reference crop ET by crop coefficients. Alfalfa crop coefficients were calculated for each site and compared with the historical crop coefficients (Table 2). Coefficients were not calculated for Scott Valley, where CIMIS reference crop ET was not available. Crop coefficients were the smallest just after a harvest and largest just before harvest.

Table 2. Crop coefficients of alfalfa.

Site	Average	Minimum	Maximum
Davis 2005	0.92	0.49	1.14
Davis 2006	0.94	0.56	1.11
Davis 2007	1.04	0.65	1.33
Kern 2007	1.01	062	1.25
Imperial Valley 2007	0.80	0.43	0.99
Tulelake 2007	0.99	0.50	1.30
Historical (Doorenbos and Pruitt, 1977)			
Humid[1]	0..85	0.50	1.05
Dry[1]	0.95	0.40	1.15
Strong wind	1.05	0.30	1.25

[1] light to moderate wind conditions

Mid-summer Deficit Irrigation

Mid-summer deficit irrigation reduced the ET, but the amount of reduction varied considerably between the experimental sites. ET differences between fully-and deficit-irrigated alfalfa during the periods of mid-summer deficit irrigation ranged from 0.2 to 9 inches (Table 3). The 2007 value for Tulelake reflects the influence of shallow groundwater, which contributed to the ET of the deficit irrigated alfalfa, while the 2008 value reflected deficit irrigation from the first of June to the end of the crop season. The difference for Kern County reflects the fact that there was only one month of deficit irrigation. The largest differences were found for Sacramento Valley. ET

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values of the fully-irrigated alfalfa during the period of deficit irrigation were similar for Imperial Valley, Sacramento Valley, and Tulelake.

Yield

Actual yield differences between fully–and deficit-irrigated alfalfa during the period of deficit irrigation ranged from 0.4 (Tulelake 2007) to 2.78 tons per acre (Sacramento Valley 2006). The small Tulelake difference reflects the shallow ground water contribution. The differences for Kern County reflect the one month of deficit irrigation. However, experience has shown that a yield of 0.5 tons per acre or smaller is not economical to harvest. Yields smaller than 0.5 tons per acre were excluded in the practical yield differences. The practical yield differences represent the economical yield loss to the grower.

Table 3.ET differences between fully-and deficit-irrigated alfalfa and fully-irrigated ET during the periods of deficit irrigation.

Site		ET differences (inches)	Full ET during period of deficit irrigation (inches)
Imperial Valley	2007	2.4	22.5
Kern County	2006	1.8	8.9
	2007	1.7	14.0
Sacramento Valley	2005	9.4	23.4
	2006	7.4	21.2
	2007	4.7	18.7
Scott Valley	2007	2.0	10.6
	2008	3.1	12.6
Tulelake	2007	0.2	18.6
	2008	4.3	24.7

Table 4. Total yield difference between fully-and deficit-irrigated alfalfa.

Site		Actual yield difference (tons per acre)	Practical yield difference* (tons per acre)
Imperial Valley	2007	1.66	1.66
Kern County	2006	0.66	1.03
	2007	0.85	1.16
Sacramento Valley	2005	1.37	
	2006	2.78	3.95
	2007	3.74	4.59
Scott Valley	2007	0.82	1.38
Tulelake	2007	0.4	0.4

* adjusted for yields smaller than 0.5 tons per acre (not considered economical to harvest)

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CONCLUSIONS

These ET measurements generally showed seasonal ET values that are higher than the historical seasonal ET values. The exception was Imperial Valley where the 2007 seasonal value was considerably smaller than the historical value. Average crop coefficients were similar to the historical values except for Imperial Valley. Mid-summer deficit irrigation reduced the ET during the period of deficit irrigation, but the differences in ET between fully-irrigated and deficit-irrigated alfalfa were site specific. Yields were also reduced by deficit irrigation.

Water transfer amounts based on ET differences are not practical because of the site-specific responses, which cannot be predicted. Although ET occurred during the periods of deficit irrigation, the source of this water used by the crop was stored soil moisture from the earlier irrigations, prior to the start of deficit irrigation. Also, this crop water use did not contribute to economical yield levels. The exception was at Tulelake where crop water use of the shallow ground water maintained high yields of the deficit-irrigated alfalfa. Water transfer amounts should be based on the ET of fully irrigated alfalfa during the period of mid-summer irrigation, which can be estimated as the product of crop coefficients and CIMIS reference crop ET. This ET also more fully reflects the reduction in applied water during the deficit irrigation period.

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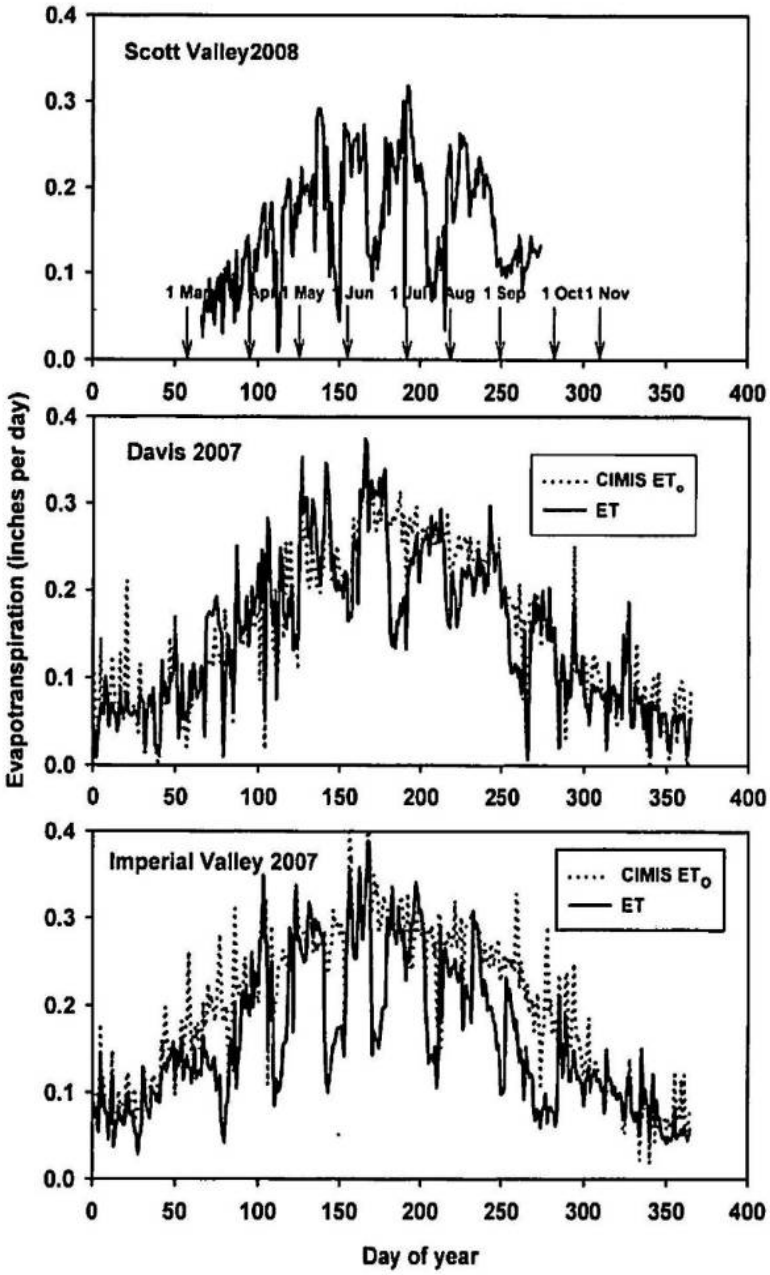

Figure 1. Daily evapotranspiration of alfalfa for Scott Valley (2008), Sacramento Valley (2007), and Imperial Valley (2007). CIMIS ET_o is the CIMIS reference crop ET, defined as the ET of a well-watered grass.

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Attachment D

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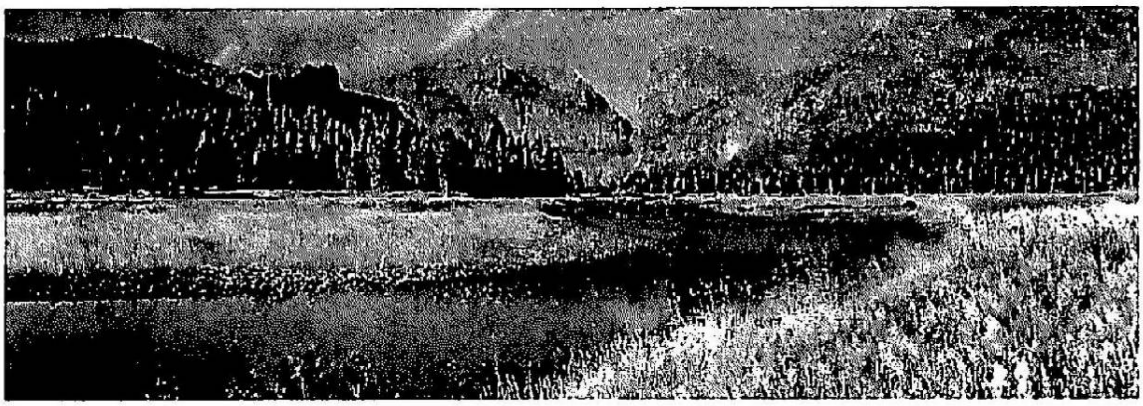
Paradise Regained



SOLUTIONS FOR RESTORING YOSEMITE'S HETCH HETCHY VALLEY

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ENVIRONMENTAL DEFENSE

finding the ways that work

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Paradise Regained

SOLUTIONS FOR RESTORING YOSEMITE'S HETCH HETCHY VALLEY

AUTHORS
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Nancy E. Ryan
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Summary of technial analyses Hetch Hetchy Reservoir alternatives (Schlumberger Water Services)

APPENDIX B
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Memorandum: Hetch Hetchy water and power issues (Somach, Simmons & Dunn)

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CHAPTER 3

California water summary

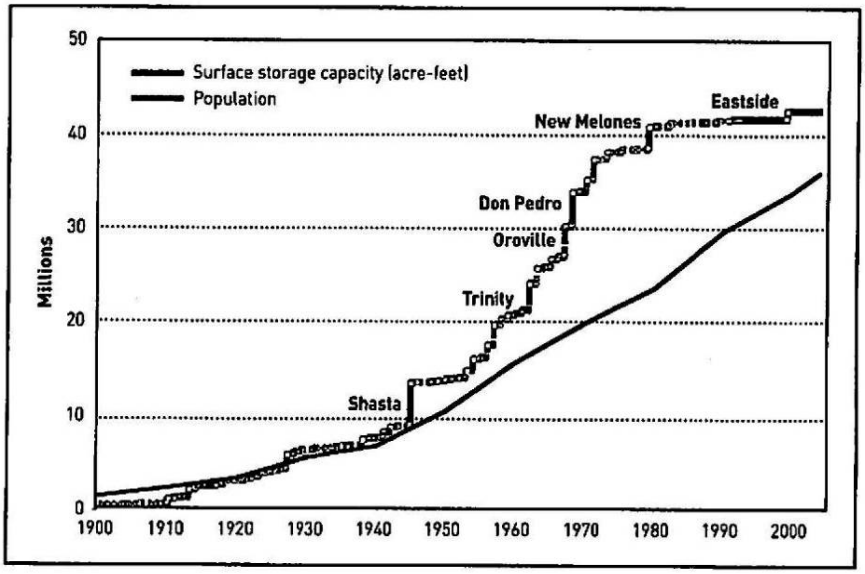
California is the most populous and agriculturally productive state in the nation, largely due to vast irrigated basins spanning the interior of the state. Californians value their natural environment and are increasingly selective in approving projects that might degrade it.

Residents are especially sensitive about further depleting the state's water resources. But because California is semi-arid, like much of the American West, its communities and economy depend on secure, safe, and reliable water supplies. For most of the past century, ensuring this reliability meant building a vast network of dams and canals to move water from rivers to distant farms and cities (Figure 3-1).

California now has more than 1,000 dams, with a combined water-storage capacity of over 40,000,000 acre-feet. Hetch Hetchy Reservoir, which today is the twentieth largest in the state, holds only 360,000 acre-feet (Figure 3-2)—although it was once the largest reservoir in the entire Central Valley watershed. Lying downstream of Hetch Hetchy and holding almost six times as much water, Don Pedro Reservoir is one of California's largest. The Turlock Irrigation District, the Modesto Irrigation District and the San Francisco Public Utilities Commission all store water in Don Pedro. San Francisco alone can store up to 740,000 acre-feet there, more than twice the maximum storage of Hetch Hetchy Reservoir.

Water volumes are often measured in **acre-feet.** One acre-foot (326,000 gallons) is enough water to satisfy the average annual needs of two to four families.

FIGURE 3-1
Surface water development in California, 1900–2000



This graph traces the course of surface-water development over the 20th century, including the dam-building boom in the decades that followed World War II. With few locations left for which dams are practical, many water agencies have found the development and management of groundwater basins to be an effective alternative. Source: California Department of Water Resources

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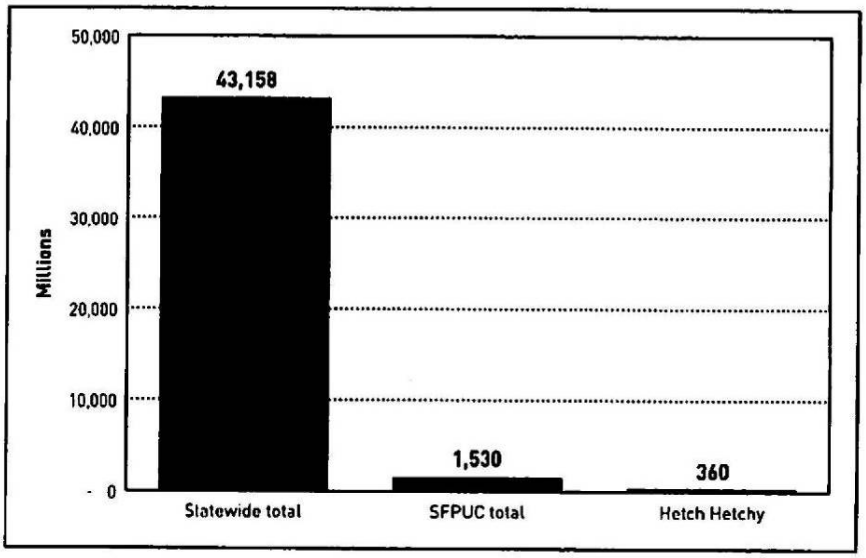
FIGURE 3-2
Comparative surface storage volumes



While the Hetch Hetchy Reservoir provides significant benefits, it is a small part of the statewide water-storage picture. Hetch Hetchy accounts for less than 25 percent of SFPUC's total storage.
Source: California Department of Water Resources and Bureau of Reclamation

Today there are few practical opportunities to build new dams that would impound the natural flow of a large river. Most of California's major rivers are already dammed, protected by law, or too remote to be economically developed. But innovative water managers are finding that they can extend supplies in a variety of other ways, including increased efficiency, recycling, local storage, groundwater management, and transfers and exchanges with other agencies that have different sources and needs.

This chapter provides an overview of current trends among California's municipalities and farming communities in how they meet their customers' water needs, including the recent approaches taken by urban water agencies. Context is thus established for the water-supply components, presented in Chapter 6, offered as possible alternatives to the Hetch Hetchy Reservoir.

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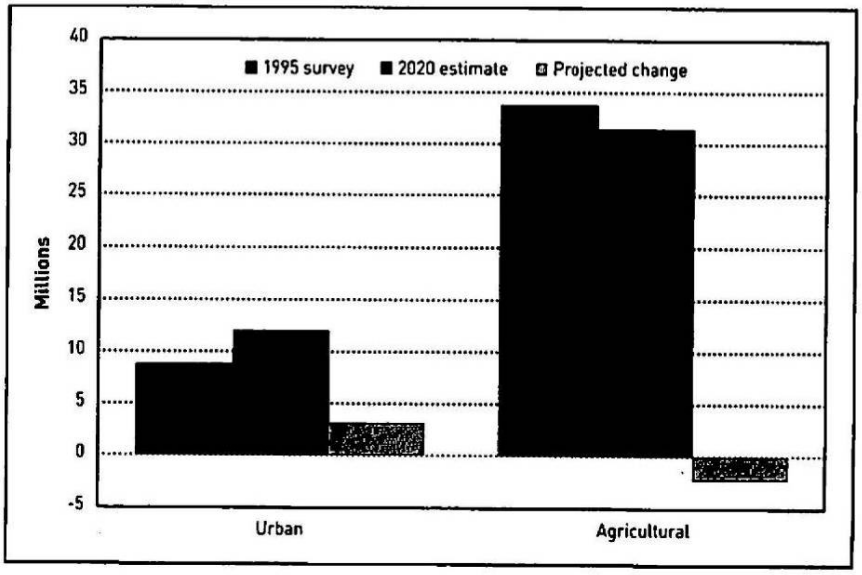
Moving water to cities and farms in California

In California, precipitation occurs disproportionately in the north, while most cities and farms are located in the southern two-thirds of the state. The State Water Project and the federal Central Valley Project store winter storm runoff and spring snowmelt in a series of large dams in northern California on the Sacramento, Feather, Trinity, and American Rivers. Releases from these reservoirs pass through the Sacramento-San Joaquin Delta, where as much as 6,000,000 acre-feet per year of water are diverted to cities and farms in central and southern California via an intricate system of pumps, pipes and canals. Southern California also receives significant supplies from the Colorado River through the All-American and Coachella Canals and the Colorado River Aqueduct, though their supplies have recently been cut.

FIGURE 3-3
Projected changes in statewide water use (1995–2020)



California's State Water Plan projects increases in urban water use that are partially offset by slight decreases in agricultural use. Source: California Department of Water Resources

Agricultural water-use trends

Statewide, approximately 80 percent of developed water in California is used by irrigated agriculture. Over the next 30 years, as cities, suburbs and rural communities continue to grow, a slight reduction in the agricultural proportion is expected.[1] Some of this reduction is attributable to the Metropolitan Water District of Southern California, which will be taking a greater share of State Water Project (SWP) supplies, leaving less available for the SWP's agricultural contractors. In addition, agricultural districts are finding that they can improve water-use efficiency or switch to crops that use less water. Some of them have profited from this strategy by selling or leasing unneeded water for urban use or to provide environmental benefits.

STUART WOOLF

CALIFORNIA DEPARTMENT OF WATER RESOURCES

Left: Farms throughout California are increasingly adopting water efficient technologies, such as above ground drip irrigation, as used on the Central Valley farm pictured above. Right: California is the top agricultural producer in the nation contributing over half of the nation's nut, fruit, and vegetable production.

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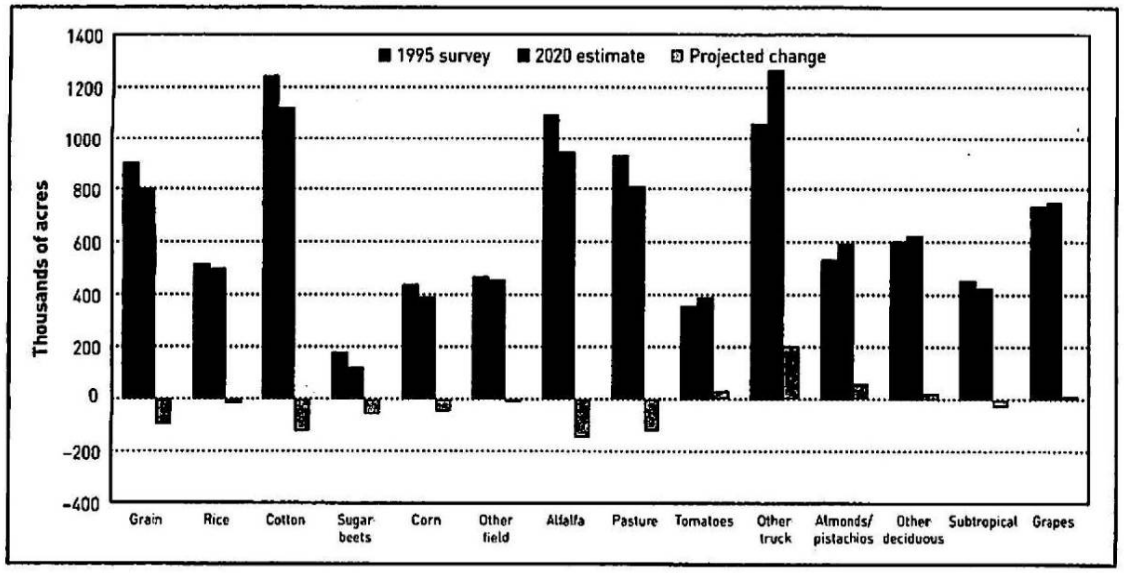
FIGURE 3-4
Projected change in crop acreage (1995–2000)



The California State Water Plan projects adjustments in various crop acreages between 1995 and 2020. The largest projected decrease is for alfalfa, a crop that uses up to 7 acre-feet of water per acre annually, depending on location. The largest increase is for "other truck" crops (such as vegetables and melons) that typically use less than one-half of the water per-acre required by alfalfa, even as they result in greater revenue and employment.[2]
Source: California Department of Water Resources

To compete in today's global economy, farmers have needed to become increasingly sophisticated. They must carefully determine which crops to grow each year, based on factors ranging from water availability and soil quality to international market trends. California's State Water Plan thus predicts overall shifts within agriculture over the next few decades, in response both to anticipated competition from other regions and the future costs of production (Figure 3-4). In many areas, farmers have already gone "high-tech"—they are using Global Positioning Systems, for example, to better manage their fields. This technology complements other efficiency investments, such as drip irrigation, which help farmers grow more for the same or lesser amounts of water.

Urban water use

In 2000, California's cities used about 8.7 million acre-feet of water.[3] With the exception of multi-year droughts, adequate supplies have been available to meet demands despite a rapidly growing population. In fact, since the late 1970s, urban water use has increased only moderately as urban agencies throughout the state have found new ways to provide safe, clean and reliable water supplies for their constituents. Increasingly, these agencies are turning from remote dams and reservoirs to a host of other alternatives that are more cost-effective, more reliable, and usually far less environmentally damaging. They include:

- Building local reservoirs to store supplies, whether local and imported
- Transfers, either in all years or in dry years, from agricultural districts
- Surface and groundwater exchanges with agricultural districts
- Increased water-use efficiency (also known as conservation or demand-side management)

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- Recycling and wastewater reclamation
- Desalination

LOCAL STORAGE

In the last 10 years, two new reservoirs have been built by California water agencies to better serve local customers. In 1998, the Contra Costa Water District completed Los Vaqueros Reservoir (100,000 acre-foot capacity). In 2003, the Metropolitan Water District of Southern California completed the Eastside Reservoir (800,000 acre-feet). Both are "off-stream" reservoirs that do not dam major rivers but are filled primarily in wet years with imported supplies, thereby providing increased reliability in dry years.

San Francisco's proposal to expand the capacity of its Calaveras Reservoir from 97,000 acre-feet to 420,000 acre-feet is in a similar spirit. If Calaveras Reservoir were to grow to that size, it would need to include infrastructure for pumping surplus (wet-year) Tuolumne River supplies into the reservoir for use in dry years.[4]

TRANSFERS

Water transfers, put simply, are one water user's sales to another. Historically, municipal agencies and agricultural districts developed water supplies independently, with few market-based dealings between them. But water managers from the different sectors have learned to implement mutually beneficial transactions. Given the great difference in scale between established agricultural and urban water demands, moreover, transfers to meet moderate growth in the urban sector can be accomplished without major disruption in overall agricultural uses statewide.[5]

Thus short- and long-term water transfers, totaling hundreds of thousands of acre-feet, have annually been occurring between water users.[6] *Water Strategist*, a publication that reports on marketing, legislation, litigation and financial information related to water resources, identified 30 separate transactions, including 7 permanent acquisitions, that took place in California during 2003. In most cases, the buyers were municipal agencies representing large and small cities. The state and federal governments also bought supplies, on behalf of the public, to protect and restore fisheries in the Sacramento-San Joaquin Delta estuary.[7]

Southern California agencies in particular, including the Metropolitan Water District (MWD), have in recent years been actively purchasing both Central Valley and Colorado River water supplies through a variety of means, including:

- A 1988 agreement between MWD and the Imperial Irrigation District (IID) for 90,000-110,000 acre-feet per year in exchange for funding a conservation investment program within IID.
- A 2002 agreement with Sacramento Valley parties that would provide MWD and other agencies that receive supplies from the Delta with at least 92,500 acre-feet (and up to 185,000 acre-feet) at costs ranging from $50 per acre-foot in above-normal years to $125 in critically dry years.
- A 2003 agreement between the San Diego County Water Authority (SDCWA) and IID for a long-term agreement to purchase 200,000 acre-feet per year from IID at a starting price of about $260 per acre-foot.
- A 2004 agreement between the Palo Verde Irrigation District (PVID) and MWD to purchase up to 111,000 acre-feet per year from PVID farmers for approximately $100 per acre-foot. The deal also includes a one-time initial payment of approximately $500 per acre-foot.

Transfers have the potential to reduce water scarcity. However, like every other

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CALIFORNIA DEPARTMENT OF WATER RESOURCES

After years of negotiations, a long-term agreement between San Diego and the Imperial Irrigation District was reached in 2003.

source of water in California, voluntary transfers are frequently accompanied by controversy. Local communities often assert that while water sales may benefit a few local agencies or farmers, the broader community can be harmed through a variety of effects, including depressed agricultural production or depleted groundwater. Both the IID-SDCWA and PVID-MWD agreements noted above include advance commitments to mitigate at least some of these potentially adverse socio-economic impacts.

GROUNDWATER BANKING AND EXCHANGE PROGRAMS

Urban agencies and agricultural districts are beginning to work together to manage groundwater efficiently. Under a typical groundwater banking and exchange program, in wet years a portion of an urban agency's surface water is diverted to an agricultural district, where it can be stored underground (Figure 3-5). In a dry year, some of the agricultural district's surface water is diverted to the urban area to augment the urban area's limited supply, and the

FIGURE 3-5
How a groundwater exchange program works

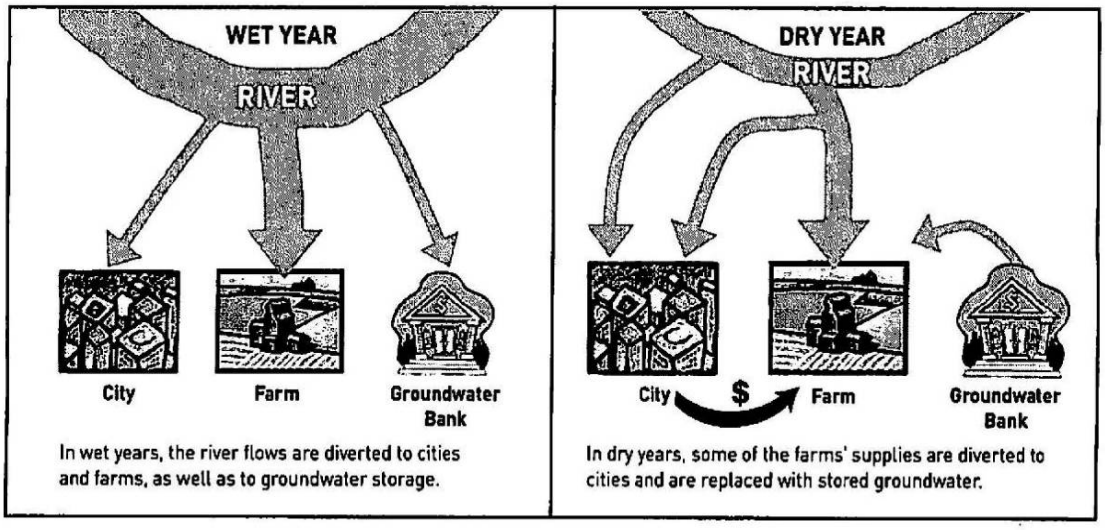

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TABLE 3-1
Current groundwater exchange programs

Urban agency	Maximum extraction capacity Thousand acre-feet/year	Maximum storage capacity Thousand acre-feet
Metropolitan Water District	153	700
Santa Clara Valley Water District	78	350
Alameda County Water District	33	150
Zone 7 (Livermore-Amador Valley)	14	65

These programs are currently in place with Semitropic and Arvin-Edison Water Districts. MWD's agreements involve costs of about $300 per acre-foot.[8]

agricultural district can then extract the stored groundwater to supplement its own supply. The frequency of physical exchange under these agreements varies, but additional groundwater is normally pumped in dry years only.

Several Bay Area districts have banked water in the Semitropic Water District in Kern County, and Southern California's Metropolitan Water District has banked water with Semitropic and with the nearby Arvin-Edison Water District as well (Table 3-1).

San Francisco has investigated groundwater-banking alternatives for more than a decade, though has yet to implement any such programs. A 1993 study evaluated 15 separate alternatives, ranking 7 of them as "good" opportunities[9]. San Francisco's Water Supply Master Plan (2000) identifies groundwater-banking opportunities in the Bay Area, the lower Tuolumne watershed and other Central Valley locations as well.

URBAN WATER CONSERVATION

Water agencies throughout California now recognize that assuring a reliable supply includes the management of demand. The combination of new technology, educational opportunities and public sentiment are prompting these agencies to stimulate efficient water use among their customers. Local crises also play a role. In large part as a result of the 1976-1977 and 1987-1992 droughts, many agencies—including the Los Angeles Department of Water and Power and MWD—were driven to increase their investments in water-conserving devices in homes and businesses as well as in educational programs to encourage behavioral changes among urban water users.

For most agencies, however, there is room for improvement. Some Central Valley cities do not even measure a customer's water use. In *Waste Not, Want Not: The Potential for Urban Water Conservation in California* (November 2003), the Pacific Institute estimates that one-third of California's current urban water use—more than 2.3 million acre-feet—can be conserved with existing technology. Though some might believe that an inevitable consequence of improved water-use efficiency is increased urban growth, it should be noted that conservation can provide many environmental benefits. Conserved water may be used to enhance in-stream flows, for example, or play a role in restoring Hetch Hetchy Valley.

In a cooperative effort to increase efficiency, urban water agencies and

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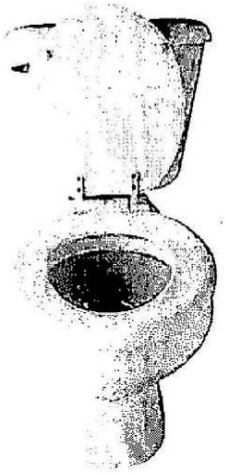

The campaign to save Mono Lake included a grassroots effort, led by The Mothers of East L.A. with funding from MWD and Los Angeles Department of Water & Power, to retrofit older water-wasting toilets.

GETTY IMAGES

public-interest organizations created the California Urban Water Conservation Council (CUWCC) in 1991. The council has since identified 14 "Best Management Practices," including toilet retrofits, horizontal-axis washing machines, metering, and public education, to help ensure reliability by reducing demand.

The San Francisco Public Utilities Commission has implemented a number of the Council's recommendations and is providing water-conservation incentives to its residential, commercial, and large-landscape customers; more generally, the SFPUC is engaging in public outreach. The Commission estimates that water-conservation measures will help reduce its retail demand in 2020 by over 30,000 acre-feet.

Other urban water agencies, including some members of the Bay Area Water Supply and Conservation Agency, are either not members of the CUWCC or have only begun to implement its recommendations. This suggests that considerable untapped possibilities remain for water conservation in the Bay Area and likely in other parts of the state as well.

RECYCLED MUNICIPAL WATER

Water recycling, which involves treating municipal wastewater sufficiently to protect public health and then making it available to customers—normally, for non-potable uses—has been used in California since the 1800s. But it has become a significant supplemental water source only in the past few decades. Currently, California's urban areas recycle about 500,000 acre-feet of wastewater annually, and the statewide potential is estimated to be some 1.5 million acre-feet per year statewide by 2030.[10]

Public policy in California has placed a high priority on replacing freshwater with recycled water for uses such as industrial processes or irrigation. The San Diego County Water Authority, for example, currently reuses 13,000 acre-feet of recycled water, or 3 percent of total supply, each year; and by 2020 it is projected to reuse over 53,000 acre-feet per year, or 6 percent of total supply.[11] The Southern California Water Recycling Initiative, a partnership of 10 urban water agencies (including SDCWA and MWD), plans to launch 34 new projects by 2010 with a total potential yield of 451,500 acre-feet per year of additional recycled water.

The San Francisco Bay Area is beginning to catch up with the southern part of the state. The Contra Costa Water District currently recycles some 10,000 acre-feet per year—about 8 percent of its total use. The SFPUC is currently developing a cost-effective system to deliver recycled water to parks, open spaces, golf courses, street medians and commercial buildings, as well as to other customers for non-drinking purposes. Once it is implemented in 2006, San Francisco's Recycled Water Program should be producing almost 17,000 acre-feet per year[12] or 6 percent of total supplies. Meanwhile, the Bay Area water and wastewater agencies, assisted by state and federal agencies, have formed a partnership—the Bay Area Regional Water Recycling Program—and have collectively identified a recycled water market of at least 125,000 acre-feet per year in the Bay Area.

DESALINATION

New technologies have created increased optimism that desalination, a water-treatment process that removes salt from brackish water and seawater, might play a significant role in assuring future water supplies. Since the mid-1960s, urban water agencies throughout the state had found desalination to be

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infeasible because of its associated high energy and environmental costs. Over the past decade, however, improvements in technology combined with the increased cost of conventional supplies have made desalination competitive, in some cases, with importing water or recycling water.[13]

In a joint effort, the four largest Bay Area urban agencies (SFPUC, East Bay Municipal Utility District, Contra Costa Water District, and Santa Clara Water District) are currently exploring the development of regional desalination facilities. Through this Bay Area Regional Desalination Project, it is estimated that almost 135,000 acre-feet per year could be available for potable use by 2020 at an economically viable cost of $377–429 million (2002 dollars).

Bay Area water interconnections

The Bay Area's largest water agencies developed independently, with separate infrastructure and their own sources of supply. In many cases, these agencies have pipelines that cross but do not interconnect, making it difficult for them to help each other in times of need. In 2000, the Association of Bay Area Governments and the CALFED Bay-Delta program (a collaboration of state and federal agencies) acted to address this oversight. The two entities established a task force of local urban water agencies to help coordinate and connect these independent systems and to encourage their mutual pursuit of conservation and water transfers. As the many water agencies are finally starting to work together, some interconnections have already been completed.

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Attachment E

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MINUTES OF THE SIGNIFICANT ECOLOGICAL AREA TECHNICAL ADVISORY COMMITTEE (SEATAC) MEETING OF 11 May 2009

(Minutes approved on ____ 2009.)

DRAFT

PERSONS IN ATTENDANCE:

SEATAC MEMBERS

Dr. Jonathan Baskin (absent)
Dan Cooper
Ty Garrison
Scott Harris
Michael Long
Dr. Thomas Scott
Dr. Cheryl Swift (absent)

REGIONAL PLANNING STAFF

Dr. Shirley Imsand (SEATAC coordinator)
Steven Mar (SEATAC coordinator)
Adrienne Lee, Ordinance Studies
Anthony Curzi, Impact Analysis
Kim Spalay, Advanced Planning
Alejandra Baldwin, Land Divisions
Rudy Silvas, Impact Analysis

NextLight, AV Solar Ranch One representatives and interested parties, TR 071035, RENVT 200900037, CUP 200900036

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John Davis IV, Lead Biologist, URS	(805) 964-6010
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Tesoro del Valle representatives and interested parties, VTTM 51644, CUP 92-074

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3. **Consideration of criteria for application reports for SEATAC biologist list, p.2**
4. **Los Angeles County Oak Tree Permit Ordinance Revision, p.3**
5. **NextLight AV Ranch 1, TR 71035, RENVT 2009-00027, CUP 2009-00026, p.5**
6. **Tesoro del Valle, VTTM 51644, CUP 92-074, p.10**

****

NOTE: SEATAC MEETINGS ARE INFORMAL WORKING SESSIONS. MEMBERS ARE APPOINTED VOLUNTEERS IN AN ADVISORY CAPACITY. MINUTES ARE PREPARED BY PLANNING STAFF PRIMARILY FROM NOTES. SESSIONS ARE ALSO TAPE RECORDED BUT THE TAPES ARE PRIMARILY FOR BACK-UP USE BY STAFF. VISITORS ARE ADVISED TO MAKE PROPER NOTES AND/OR RECORD THE SESSION. ISSUES NOT DISCUSSED BY SEATAC DO NOT IMPLY TACIT APPROVAL. NEW OR CLARIFIED INFORMATION PRESENTED IN SUBSEQUENT SUBMITTALS MAY RAISE NEW ISSUES AND MAY REQUIRE FURTHER ANALYSIS. MINUTES ARE GENERALLY APPROVED AT THE NEXT SEATAC MEETING. DRAFT MINUTES MAY BE REQUESTED BUT ARE SUBJECT TO REVISION.

****

MINUTES
11 May 2009

DRAFT

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AGENDA ITEMS

1. **Minutes** of 2 March 2009 were previously approved by electronic mail on 21 April 2009. Michael Long moved for approval and Scott Harris seconded the motion.

2. Mr. Thomas Ryan *et al.* have prepared **"Los Angeles County Sensitive Bird Species Analysis"** published in WESTERN TANAGER 75(3) Jan-Feb 2009: E1-E4. The List may also be viewed online:

   http://losangelesaudubon.org/index.php?option=com_content&task=view&id=325&Itemid=150

   Mr. Ryan proposes that the list be used as a reference for SEATAC reports, to ensure that sensitive birds in the County be addressed. SEATAC agreed to have a presentation from Mr. Ryan and to consider whether to use the list as a watch list or as CEQA significant.

3. **Criteria for County Biologist** preliminary review of applications to be on the SEATAC biologist list were that the biologist seem competent from the application. For the report, technicalities are not really important unless there are so many problems that the report is difficult to read easily. Species list completeness and review of species should demonstrate proper knowledge. Reports should not be objective based upon the best available science regarding the issues and impacts.

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NEW BUSINESS:

4. Discussion of proposed amendment to County Oak Tree Permit Ordinance (Title 22 Zoning Code). Presentation by Department of Regional Planning staff member, Ms. Adrienne Ng, of the Ordinance Studies Section.

Notes on Ms. Ng's presentation:

The Oak Tree Permit Ordinance was adopted in 1982, and it has changed little since then. Revision began in 2003. The ordinance update will expand definitions, revise definition of jurisdictional (protected) trees, and expand the scope of the administrative permit (those requiring minimal review, the minimum fee and hearing officer review). Non-native oaks will be exempt from requirement of permits; brush clearance and dead wood clearance may now need a permit. Retroactive permits are now included in the code. Proposed is to allow 2 removals and encroachment of up to 4 oaks with the administrative review. Over five (5) trees must be treated as a CEQA issue according to SB 1334. Possibly the issue might be made dependent on lot size. The goal is to have the ordinance accord with SB 1334 (Kuehl Bill) which specified 5-inch DBH trees as jurisdictional. (DBH = diameter at breast height, which is standardly measured at 4.5 feet). The problem is to establish the minimum trigger for requiring a permit for encroachments and removals. Heritage trees will be excluded from administrative permits. The size of a heritage tree is to be lowered from 36 inches to 24 inches; multiple trunks are all to be considered. Trimming and removal are to be tied to the MBTA (Migratory Bird Treaty Act) and DFG (California Department of Fish and Game) code to avoid impacts to nesting birds.

SEATAC Recommendations:

1) **SEATAC recommends maintaining the limit for the minimal permit (lower fee and hearing officer decision) at one tree removed. Removal of more than one tree or a to-be-determined amount of encroachment (for example, 20% on 2 trees is used in City of Agoura Hills) should result in the more stringent level of review involving a higher fee and a public hearing. Encroachment on the protected zone of an oak tree should be quantified (as a percentage).**

2) **Valley oaks tend to be solitary, and they should need a permit with public hearing at even encroachment or removal of one oak.**

3) **SEATAC recommends that the limit for jurisdictional scrub oak DBH be lowered so that scrub oaks 5 inches DBH and larger are included.**

4) **The cumulative diameter that is summed to determine jurisdictional or not should be calculated from all trunks.**

5) **SEATAC "encroachment" should be defined to include certain uses underneath oak trees (car parking, horse corrals) that are eventually damaging to oaks. Continuous trampling or heavy weight over the roots is definitely an encroachment to these trees with shallow roots.**

6) **SEATAC states that even if an oak tree or oak woodlands is not encroached upon, it is, nevertheless, impacted if located within a high use area.**

7) **SEATAC recommends setting up an oak tree fund into which developers pay mitigation funds. The funds should accumulate and become a fund for purchase or restoration of land with oak woodlands or with potential for restoration of oak woodlands.**

8) **SEATAC would like the ordinance to consider oak woodlands and not just individual oak trees for analysis. The proposed introductory language of the**

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ordinance does indicate that the community of oaks, oak woodlands, is one of the focal points of the ordinance. "B. Preserve and enhance property values by conserving oak trees . . . and the natural communities in which they exist." Structuring the oak tree ordinance to also protect oak woodlands should not generate a conflict.

9) Irrigation should be restricted to be outside the protected zone, which is codified as 5 feet beyond the canopy or 15 ft. from the trunk, whichever is greater. The actual reach of oak tree roots is probably about twice the diameter of the canopy measured from the trunk.

10) Routine maintenance of utilities should also require permits, so that there is some review of criteria for proposed trimming and removals by utilities. Emergency trimming may be exempt. Routine maintenance should be planned to be outside nesting season, which coincides with a good time for oak trees to get trimmed.

11) Planting of small trees is the most feasible for eventual independent growth, but current specifications of 2:1 or even 10:1 planted tree:removed tree probably do not match to the probability of having one of the planted oaks mature to the size of the oak removed. Heritage trees may be 150 years old and older. The true cost of oak removal should be presented early on in the planning process, so that plans may be redesigned to avoid impacting the oaks.

12) If DBH is retained as the determinant of what number of mitigation trees are needed, then perhaps something like twice the diameter of removed tree should equal the summed diameters of replacement trees. Cross sectional area might be another determinant for the number of trees needed for mitigation.

13) SEATAC recommends an oak restoration plan and/or monetary assessment be a requirement to mitigate impacts to oak trees or at a minimum be an "in lieu fee." SEATAC states that a planting strategy to mitigate oak tree impacts will not be defensible in court cases. The size of tree that can be successfully planted and nurtured, cannot replace the ecological value of a mature tree of 8 inches or even 5 inches diameter, for which the permit allows removal or encroachment. Five-inch trees are often 30-50 years old.

ACTION TAKEN: The above comments and recommendations were taken into consideration by Department of Regional Planning staff member Adrienne Ng of the Ordinance Studies Section.

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5. **Project Description: NextLight, AV Solar Ranch One**

Tract TR 071035, RENV 200900027, CUP 200900026

Applicant: Roy Skinner of NextLight

Biologist: John Davis IV of URS Corporation, Santa Barbara

A project for a new solar photovoltaic facility in the vicinity of Fairmont Butte is proposed for approximately 2100 acres. The project site is located approximately 20 miles northwest of the City of Lancaster in Los Angeles County, California. The site is roughly between 155th Street West and 180th Street West and between Avenue B-5 West and Avenue E West. The project includes a 20,000 sq.ft. facility building, an 8 ft.-high perimeter fence to prevent vandalism, and transmission line to deliver power produced. The transmission line for the project will run north along 170th St. West for 3.5 mi. to the SCE Whirlwind substation on Astoria Avenue in Kern County or, alternatively, 1.5 miles along Avenue C to connect into the Antelope-Magunden transmission line.

The current use of some of the land is agricultural and fallow agricultural, but most is land that has had previous agricultural use and is now covered by rabbitbrush scrub or non-native grasses. There is a 27-acre ranch with domicile and outbuildings that will be left. The ranch has junipers, exotic trees, and a defunct pistachio orchard that supports a number of native birds. The southeast corner of the project has a wildflower field of California Poppies, Goldfields, Lupine, and other wildflowers. The site includes part of a Significant Ecological Area, **SEA #61, Joshua Tree Woodland Habitat SEA**. There has been some recruitment of Joshua Trees onto the subject property that is not included in the SEA, and about 2 of 5 recruits would be removed. The part of the property in the SEA has no Joshua Trees at the present time.

The project includes the 20,000 sq.ft. facility building, 75,000 tilted tracker units, 2300 drive motors, 400 pads for electrical equipment. There are two types of ballast bases proposed for the panels: the current design is of heavy concrete blocks approximately 10'x2'x1.5'. Tracker units will have connected foundations for stability in severe wind conditions. A less expensive and preferred base is currently in design, a screw-type base that would cover less area than the blocks but need drilling into the ground for about 15' depth. Drive motors will be on concrete pads 8' X 12' spaced 1200' apart. High points of the tilted tracker units will be about 15 ft. above ground surface and electrical equipment enclosures reach to about 12 ft. height.

Grading proposed is 700,000 cu.yd of cut and 700,000 cu.yd. of fill to be balanced on site. Most of the grading is for channelizing the main drainage course, which will be about 10' deep at the SW end and even with the surrounding terrain at the NW end. The walls of the main course are to be earthen, and "V"-shaped groins in the sandy stream course will direct water flow away from the walls. Other drainages on site will be left as is. There are several drainages on-site that start abruptly with a depth of about 3-5 ft. and terminate by

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flowing out onto the surrounding desert plain. The origin and nature of these ancillary, apparently unconnected drainages is unknown. It is anticipated that very minimal grading will be needed for the remainder of the site, as the applicants hope to keep the present ground covers to minimize dust production, which would be detrimental to optimal radiation reception. The project installation may require some grading for flat alignment of the solar panels. Production of electricity would occur about three years after construction begins. The site is evaluated as averaging +7.5 KWh/m^2/day.

SEA RESOURCE DESCRIPTION: The **Joshua Tree Woodland Habitat** is diminishing at an accelerating rate in Los Angeles County due to agricultural, solar, and urban expansion in the County's desert regions. This vegetation has a fairly strict elevation criterion and occurs between 4500-5000 feet. The dominant species is the Joshua Tree (*Yucca brevifolia*) which may reach heights of 5 to 12 m. Other common species of the woodlands include Mojave Yucca, sage, box-thorn, and buckwheat.

Action Requested: **Review of Biological Constraints Analysis to advise on preparation of the Biota Report. The Biota Report will be used to prepare the Environmental Impact Report (EIR) for California Environmental Quality Act (CEQA) compliance under Article 7, Section 15080. Mitigation measures may be proposed by SEATAC for incorporation into the EIR.**

Notes on the Applicant's presentation:
The project site was first considered in the mid 1990s. The last use of the pistachio orchard was in 2004. NextLight Solar purchased the property in 2008. The expected use of water is minimal as photovoltaic screens do not need as per[illegible] a surface as mirrors: twice a year at 2 gallons for each panel. A similar installation at Nellis Air Force Base [illegible] has not had to wash their panels in over one year. Fairmont Butte SEA #57[illegible] close to the project site. The project has 5 blue-line drainages in its parcels. One drainage is to be filled. One is to be diverted as described in paragraph #4 above. One of the recruit Joshua trees is now flowering. The other mature tree is one at the side of 170th Street W, which will be left [illegible]. The applicant hopes to retain the natural vegetation as a preventative measure against dust. Some of the rabbitbrush will need to be trimmed to 18 inches height to avoid interference with the panel movement. The spacing between panels allows panels to track the sun and will allow sunlight to fall on some areas below the panels. The applicant may test use of sheep grazing to cut vegetation, but probably mechanical control will be the method used. The Fire Department may require complete clearing to avoid fire hazard. The 1200 foot separation is for the tracker service roads. Fixed panels would be much less efficient. The applicant is studying possibilities for permeable fencing to allow terrestrial animals to cross into and out of the project site. No threatened or endangered species have been observed at the project site. The chief known sensitive species that is to have mitigation on site is the Burrowing Owl, which has been observed in the main drainage and in the southeastern corner. Construction will begin in 2010, and partial production of electricity will commence as soon as sufficient structure has been installed. Total build-out will probably happen in 2010. About 3 square miles is needed to generate electricity in a profitable scheme from photovoltaics.

SEATAC Comments:

SEATAC was pleased to see use of the relatively new list "Los Angeles County Sensitive Bird Species Analysis" by Thomas Ryan et al. This demonstrates diligence

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in being current for the avifauna. (SEATAC member Long misapplied this comment to Tesoro when it should have been applied to this project.)

SEATAC Recommendations:

1) SEATAC states that this seems to be a good site for a solar project compared to others now in process. It is on former agricultural land, topographically flat, degraded for natural vegetation, albeit recovering. The entire area, however, is a desert wash, a habitat type that is naturally biologically diverse and valuable to protect, and the impact will be extensive, 2100 acres removed or 3.5 square miles.

2) The evaluation of impact should include size of this project in conjunction with other projects. The overall regional impact is very substantial.

3) SEATAC would like an estimate of what the ambient temperature change will be, and would like application of this value in evaluating impact of temperature change to the flora and fauna of the site and adjacent areas.

4) SEATAC states that the planned motorsport park on the southeast corner could present dust problems, although prevailing winds will tend to place it in a downwind location.

5) SEATAC wants to see an analysis of site alternatives. Is there a better alternative to place the project? Alternatives must consider project purpose, objectives, requirements for proximity to transmission, topography, etc. One member suggested that there is also fallow agricultural land in the Imperial Valley, that might be even less impacted than the current choice. SEATAC also suggests analyzing alternative uses on the site. Is a solar energy facility the best use for the site?

6) Reconfiguration of the drainage courses will be regulated by the California Department of Fish and Game and other state agencies.

7) The plant list seems sparse and not detailed enough. For the biota report there should be review at least of the project USGS quadrangles, and all surrounding quadrangles for the CNDDB list and for the CNPS list.

8) The avifauna reported (Mountain Bluebird, Burrowing Owl, Western Meadowlark, Horned Lark, for example) seems to indicate an imperiled grassland habitat. If so, this group of birds and other grassland animals may no longer use the site when it becomes a solar panel array. This change should be addressed in the impact and mitigation analysis.

9) Buffering of the Joshua Tree woodland with 80 feet distance from the solar panels seems inadequate. There should also be a transition zone of an additional 20 feet, for 100 feet total.

10) SEATAC deems sheep grazing to be infeasible for this project – issues with dust control from grazing, close proximity to sensitive solar equipment by stock animals, and a big potential for introduction of more invasive plant species are

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problems with this scheme. Even though sheep are less destructive than goats and probably less destructive than cattle, they do uproot plants. The guess is that there will be even greater problems with dust from sheep grazing.

11) SEATAC agrees that, from a biological standpoint, use of fire breaks, fire buffer zones, and vegetation control would be better than full vegetation clearance of the site.

12) The occurrence of Joshua Tree recruitment is an unusual finding, and impact to this area is important to mitigate. These recruits deserve all that can be done to promote their continued growth to mature trees.

13) There is a definite need for spring survey information on both plants and animals.

14) SEATAC asks that applicant take into account the types of animals that might be attracted to the site. If those animals (for example, rodents, birds nesting in transmission lines and equipment) would be a nuisance, then address how these animals will be controlled/removed from the site. Anticoagulant rodent control should NOT be used. Bird nesting issue needs addressing.

15) SEATAC needs to know exact details of any transplantation of burrowing owls that is proposed. What is the intended relocation area, and how will relocation be accomplished? How will relocation be monitored?

16) SEATAC would like more consideration of the issue of burrowing owls using the drainage channels on site. Burrowing owls were once common throughout the County, and are now found only rarely outside the Antelope Valley, so this site may be an important study area for them. SEATAC needs to have the applicants do further study to determine how the population relates to population outside and in the project site, and whether this is part of a colony. Colonies seem to be tied to particular places and are clustered, and conversion of these sites may be one of the causes of the diminution of the County population of burrowing owls. Further study should consider the seasonality of the various populations: some migrate from elsewhere and breed in the spring-summer, some are resident breeders, and some take up temporary residence during the winter migration. For continued monitoring, point counts will not be appropriate for judging population trends over time.

17) SEATAC questions whether a 160-foot buffer area around Burrowing Owl burrows is going to be sufficient. Can these birds forage in a field of photovoltaic panels?

18) Desert and coastal horned lizards are on the site. It is important to propose mitigation for this sensitive species. Clearing of the site could well make it unusable for the lizards.

19) The observation of 9 Mojave green rattlesnakes is frequent observation of a large, community-structuring predator. This indicates that "fallow" fields are not that fallow, and that much natural structure has developed in the fields since the last agricultural use.

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20) SEATAC would like closer scrutiny of the possibility that birds come from the adjacent Joshua Tree woodlands onto the site to forage.

21) Loss of raptor foraging area is a continuing and important impact to Antelope Valley. Ferruginous Hawk and Swainson's Hawk may use the Joshua Trees and forage on the site. This potential impact should be addressed.

22) SEATAC would like incidence of Merriam's Kangaroo Rat to be addressed.

23) Alkali Mariposa Lilies are not restricted to wetlands, and may occur on the project site. The time to look for them is now (May-June)

24) Permeability to wildlife has to include Yucca moths (necessary to Joshua Tree pollination and life—no other organism can enable Joshua Tree reproduction), birds, and large mammals.

25) A member who was unable to attend would like a map showing biological constraints overlaid onto project footprint and (both) transmission lines proposed.

26) SEATAC recommends its members take a field trip to the site.

ACTION TAKEN: Further SEATAC review is required. Incorporate the above comments and recommendations into the Biop Report and project design.

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Attachment F

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Pistachios

• Irrigation management for Pistachio trees under drought conditions

Multiyear pistachio deficit irrigation research (Goldhamer and Beede, 2004) (Goldhamer, 2005) shows that significant irrigation water (approximately 10 inches during the season) can be saved by strategically irrigating pistachios.

Critical periods when pistachio should NOT be under-irrigated are: (1) from nut filling to hull slip (Stage 3: July 1 to Sept. 15 in the San Joaquin Valley), and (2) from bloom to end of shell expansion (Stage 1: Apr. 1 to May 15 in the San Joaquin Valley).

Deficit irrigation of pistachio CAN be practiced during the following periods: (1) 50% reduction in irrigation during shell hardening (Stage 2: May 16 - June 30 in the San Joaquin Valley), and (2) 70 - 75% reduction in irrigation during the postharvest period (Oct. 1 - Nov. 15 in the San Joaquin Valley).

San Joaquin Valley pistachio water use for normal and proposed Regulated Deficit Irrigation (RDI) regimes. Irrigation schedule early in the season must take into account stored winter rainfall.

Growth Stage	Approximate Phenology	Period	Reference Water Use ET (inches)	Crop Coefficiant K	Normal Crop ET In period (inches)	Proposed RDI Level (%)	Proposed RDI Crop ET (inches)
Stage 1	Bloom	Apr. 1-15	2.36	.07	.17	100	.17
	Leafout	Apr. 16-30	2.36	.43	1.01	100	1.01
	Shell Expansion	May 1-15	3.19	.68	2.17	100	2.17
Stage 2	Shell Hardeining	May 16-31	3.40	.93	3.16	50	1.58
	Shell Hardeining	June 1-15	3.84	1.09	4.19	50	2.09
	Shell Hardeining	June 16-30	3.84	1.17	4.49	50	2.25
Stage 3	Nut Filling	July 1-15	4.13	1.19	4.92	100	4.92
	Nut Filling	July 16-31	4.41	1.19	5.25	100	5.25
	Nut Fill/Shell Split	Aug 1-15	3.54	1.19	4.21	100	4.21
	Shell Splitting	Aug 16-31	3.78	1.12	4.23	100	4.23
	Hull Slip	Sept 1-15	2.66	.99	2.63	100	2.63
	Harvest	Sept 16-31	2.66	.87	2.31	25	.57

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Postharvest	Postharvest	Oct 1-15	1.71	.67	1.15	25	.29
	Postharvest	Oct 16-31	1.83	.50	.91	25	.23
	Postharvest	Nov 1-15	.8	.35	.28	25	.07
		Totals (in.)			**41.10**		**31.70**

Source: Goldhammer, 2005

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ATTACHMENT G

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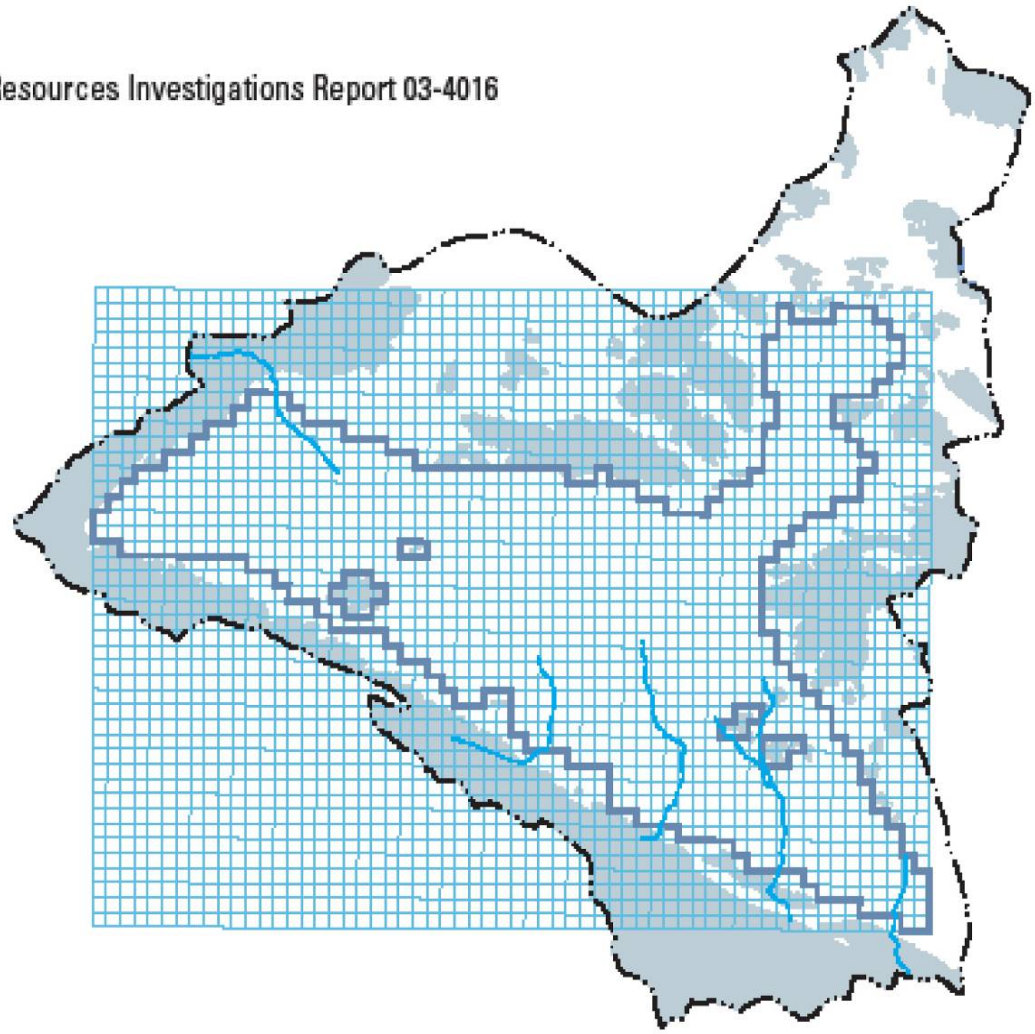
U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

Simulation of Ground-Water Flow and Land Subsidence, Antelope Valley Ground-Water Basin, California

Water-Resources Investigations Report 03-4016



Prepared in cooperation with the **Antelope Valley Water Group**

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Simulation of Ground-Water Flow and Land Subsidence in the Antelope Valley Ground-Water Basin, California

By David A. Leighton and Steven P. Phillips

U.S. GEOLOGICAL SURVEY

Water-Resources Investigations Report 03-4016

Prepared in cooperation with the

ANTELOPE VALLEY WATER GROUP

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Sacramento, California
2003

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U.S. DEPARTMENT OF THE INTERIOR

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CONVERSION FACTORS, VERTICAL DATUM, AND ABBREVIATIONS

CONVERSION FACTORS

Multiply	By	To obtain
acre	0.4047	hectare
acre-foot (acre-ft)	1,233	cubic meter
acre-foot per year (acre-ft/yr)	1,233	cubic meter per year
foot (ft)	0.3048	meter
foot per day (ft/d)	0.3048	meter per day
foot per year (ft/yr)	0.3048	meter per year
square foot per day (ft^2/d)	0.09290	square meter per day
gallon per minute per foot [(gal/min)/ft)]	0.2070	liter per second per meter
inch (in.)	2.54	centimeter
inch per year (in./yr)	25.4	millimeter per year
mile (mi)	1.609	kilometer
square mile (mi^2)	259.0	hectare

Temperature in degrees Fahrenheit (°F) may be converted to degrees Celsius (°C) as follows:

°C = (°F – 32) / 1.8.

Vertical Datum

Sea level: In this report, "sea level" refers to the National Geodetic Vertical Datum of 1929 (NGVD of 1929)—a geodetic datum derived from a general adjustment of the first-order level nets of both the United States and Canada, formerly called Sea Level Datum of 1929.

Abbreviations

AVEK	Antelope Valley/East Kern Water Agency
AVWG	Antelope Valley Water Group
BCF	Block-Centered Flow Package
CDPW	California Department of Public Works
CDWR	California Department of Water Resources
CIMIS	California Irrigation Management Information System
HFB	Horizontal Flow Barrier Package
IBS1	Interbed Storage 1 Package
INSAR	interferometric synthetic apecture radar
MODFLOW	modular three-dimensional finite-difference ground-water flow model
SWP	state water project
SWRCB	State Water Resources Control Board (California)

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UCCE	University of California Cooperative Extension
USGS	U.S. Geological Survey
d^{-1}	per day
ft^{-1}	per foot

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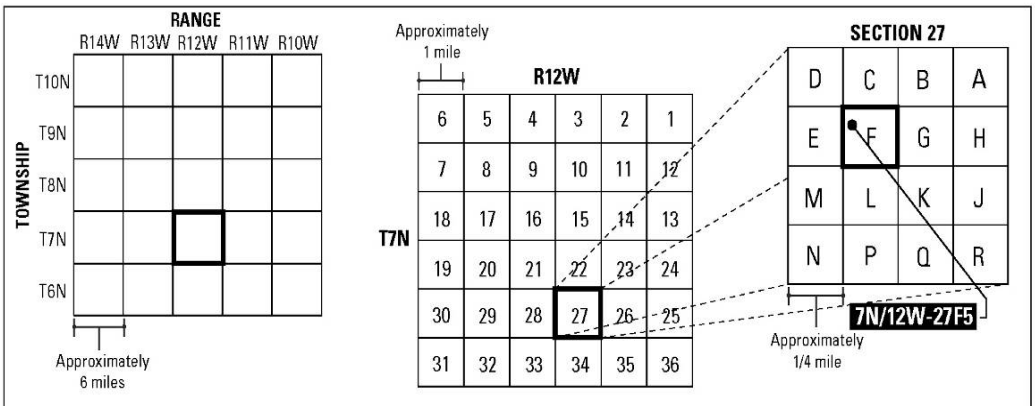
WELL-NUMBERING SYSTEM

Wells are identified and numbered according to their location in the rectangular system for the subdivision of public lands. Identification consists of the township number, north or south; the range number, east or west; and the section number. Each section is divided into sixteen 40-acre tracts lettered consecutively (except I and O), beginning with "A" in the northeast corner of the section and progressing in a sinusoidal manner to "R" in the southeast corner. Within the 40-acre tract, wells are sequentially numbered in the order they are inventoried. The final letter refers to the base line and meridian. In California, there are three base lines and meridians; Humboldt (H), Mount Diablo (M), and San Bernardino (S). All wells in the study area are referenced to the San Bernardino base line and meridian (S). Well numbers consist of 15 characters and follow the format 007N012W27F005S. In this report, well numbers are abbreviated and written 7N/12W-27F5. Wells in the same township and range are referred to only by their section designation, 27F5. The following diagram shows how the number for well 7N/12W-27F5 is derived.



Well-numbering diagram (Note: maps in this report use abbreviated well numbers such as **"27F5"**)

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Simulation of Ground-Water Flow and Land Subsidence in the Antelope Valley Ground-Water Basin, California

By David A. Leighton *and* Steven P. Phillips

ABSTRACT

Antelope Valley, California, is a topographically closed basin in the western part of the Mojave Desert, about 50 miles northeast of Los Angeles. The Antelope Valley ground-water basin is about 940 square miles and is separated from the northern part of Antelope Valley by faults and low-lying hills. Prior to 1972, ground water provided more than 90 percent of the total water supply in the valley; since 1972, it has provided between 50 and 90 percent. Most ground-water pumping in the valley occurs in the Antelope Valley ground-water basin, which includes the rapidly growing cities of Lancaster and Palmdale. Ground-water-level declines of more than 200 feet in some parts of the ground-water basin have resulted in an increase in pumping lifts, reduced well efficiency, and land subsidence of more than 6 feet in some areas. Future urban growth and limits on the supply of imported water may continue to increase reliance on ground water. To better understand the ground-water flow system and to develop a tool to aid in effectively managing the water resources, a numerical model of ground-water flow and land subsidence in the Antelope Valley ground-water basin was developed using old and new geohydrologic information.

The ground-water flow system consists of three aquifers: the upper, middle, and lower aquifers. The aquifers, which were identified on the basis of the hydrologic properties, age, and depth of the unconsolidated deposits, consist of gravel, sand, silt, and clay alluvial deposits and clay and silty clay lacustrine deposits. Prior to ground-water development in the valley, recharge was primarily the infiltration of runoff from the surrounding mountains. Ground water flowed from the recharge areas to discharge areas around the playas where it discharged either from the aquifer system as evapotranspiration or from springs. Partial barriers to horizontal ground-water flow, such as faults, have been identified in the ground-water basin. Water-level declines owing to ground-water development have eliminated the natural sources of discharge, and pumping for agricultural and urban uses have become the primary source of discharge from the ground-water system. Infiltration of return flows from agricultural irrigation has become an important source of recharge to the aquifer system.

The ground-water flow model of the basin was discretized horizontally into a grid of 43 rows and 60 columns of square cells 1 mile on a side, and vertically into three layers representing the upper, middle, and lower aquifers. Faults that were thought to act as horizontal-flow barriers were simulated in the model. The model was calibrated to simulate steady-state conditions, represented by 1915 water levels and transient-state conditions during 1915–95 using water-level and subsidence data. Initial estimates of the aquifer-system properties and stresses were obtained from a previously published numerical model of the Antelope Valley ground-water basin; estimates also were obtained from recently collected hydrologic data and from results of simulations of ground-water flow and land subsidence models of the Edwards Air Force Base area. Some of these initial estimates were modified during model calibration. Ground-water pumpage for agriculture

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was estimated on the basis of irrigated crop acreage and crop consumptive-use data. Pumpage for public supply, which is metered, was compiled and entered into a database used for this study. Estimated annual pumpage peaked at 395,000 acre-feet (acre-ft) in 1952 and then declined because of declining agricultural production. Recharge from irrigation-return flows was estimated to be 30 percent of agricultural pumpage; the irrigation-return flows were simulated as recharge to the regional water table 10 years following application at land surface. The annual quantity of natural recharge initially was based on estimates from previous studies. During model calibration, natural recharge was reduced from the initial estimate of 40,700 acre-ft per year (acre-ft/yr) to 30,300 acre-ft/yr.

Results of the model simulations indicate that ground-water storage declined more than 8.5 million acre-ft from 1915 to 1995. During the period of peak pumping (1949–53), pumpage averaged 363,000 acre-ft/yr, and 79 percent of the ground water withdrawn came from storage primarily from layer 1 (the upper aquifer). Water released from compaction of the aquitards accounted for about 21,600 acre-ft/yr of the ground water removed from storage. Downward leakage from layer 1 into layer 2 (the middle aquifer) accounted for most (86 percent) of the pumpage from layer 2. For the simulation period 1991–95 (a period representing current conditions when pumpage for public supply exceeded agricultural pumpage), pumpage averaged 81,700 acre-ft/yr, and most of the ground water withdrawn from layer 2 came from downward leakage from layer 1. During this period, ground water removed from storage accounted for 17 percent of the total pumpage and recharge from irrigation return accounted for about 39 percent of the total pumpage. Ground water removed from storage as a result of compaction of aquitards was reduced to about 3,800 acre-ft/yr.

The calibrated model was used to simulate the response of the aquifer to future pumping scenarios. Results of the simulation of scenario 1, for which total annual pumpage for 1996–2025 remained at the level specified for 1995, showed that water levels continued to rise (as much as 36 feet) in agricultural areas, continuing the long-term recovery from drawdown caused by historical agricultural pumpage. In the areas where pumping for public supply is concentrated, water levels continued to decline and subsidence continued in the central part of the ground-water basin. Water-level declines were largest (more than 100 feet) in the south-central part of the ground-water basin; most of the public-supply pumpage occurs in this area. As much as 1.9 feet of additional subsidence was simulated in the central part of the ground-water basin from 1996 to 2025. For scenario 2, public-supply pumpage was increased by 3.3 percent annually, and annual agricultural pumpage was increased by 75 percent more than that specified for 1995. Pumpage increases for scenario 2 resulted in significant water-level declines in the southern and northeastern part of the Lancaster subbasin; most pumping for public supply occurs in these areas. Results of this simulation showed that water levels declined more than 150 feet in the south-central part of the ground-water basin and that an additional 5 feet of subsidence was simulated in the central part of the basin.

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INTRODUCTION

Ground water is an important component of the water supply in Antelope Valley. Prior to 1972, ground water provided more than 90 percent of the total water supply in the valley. From the mid 1960s through the mid 1980s, ground-water pumpage declined owing to declines in agricultural production and, beginning in 1972, availability of imported water from the State Water Project (SWP). This steady decline in ground-water pumpage ceased in the mid 1980s due to increased urban growth and the associated demand for ground water. Since 1972, between 50 and 90 percent of the total water demand in the valley has been met using ground water (Templin and others, 1995). Ground-water-level declines have increased pumping lifts, reduced well efficiency, and caused aquifer-system compaction and more than 6 ft of land

subsidence in some areas (Ikehara and Phillips, 1994). Projected urban growth and limits on the available imported water may continue to increase the reliance on ground water and exacerbate aquifer-system compaction and land subsidence (Galloway and others, 1998).

Projections of water supply and demand indicate that the current supply may fall short of demand early in the 21st century (Kennedy/Jenks, 1995). Conjunctive use of surface and ground water, along with methods that can enhance or better use the ground-water resource, will likely become an important part of water-resource management in Antelope Valley. A thorough understanding of the ground-water system is needed to effectively manage the ground-water resource.

In the 1970s, the U.S. Geological Survey (USGS) developed a numerical ground-water flow model that was used by water managers to help make decisions regarding imported water from the SWP, reclaimed wastewater, and captured floodwater (Durbin, 1978). Since the development of this model, ground-water use in the valley has decreased substantially, and areas of ground-water withdrawals have changed from primarily agricultural areas to primarily urban areas. These changes in the state of the ground-water system emphasize the need for a better understanding of the system and the effects of water-management practices.

Purpose and Scope

In 1992, the USGS began working with the Antelope Valley Water Group (AVWG) to provide information needed to manage the water resources in Antelope Valley. Results from two studies completed as part of that work are presented in reports by Templin and others (1995) and Ikehara and Phillips (1994). Templin and others (1995) describes land use, water supply and demand (1919–91), and water demand forecasts in the Antelope Valley. Ikehara and Phillips (1994) describes land subsidence and its relation to ground-water withdrawals. The results of these studies and improvements in modeling capabilities, combined with data collected since the development of the ground-water flow model of Antelope Valley in the 1970's (Durbin, 1978), have made it possible to develop an updated numerical model of ground-water flow in Antelope Valley that includes the simulation of aquifer-system compaction and land subsidence. The model was developed to assist Antelope Valley water managers and planners.

The purpose of this report is to describe a conceptual model of the Antelope Valley ground-water basin, to describe the development and calibration of a numerical model of ground-water flow, aquifer-system compaction, and land subsidence, and to present results of simulated future pumping scenarios being considered by water managers. Available geohydrologic data and data collected during this study were used to develop the revised conceptual model of the flow system that forms the basis of the revised, updated numerical model of the Antelope Valley ground-water basin. The numerical model was calibrated and simulates ground-water flow, aquifer-system compaction, and land subsidence using water-level data for 1915–95 and land subsidence data for 1926–92. The model was used to provide insight into the geohydrology of the Antelope Valley ground-water basin, to test the sensitivity of the new model to aquifer-system parameters and hydrologic stresses, and to compare the potential effects of future pumping scenarios. Further, the results of this study can be used to guide future data-collection and aid in making informed water-management decisions.

Description of Study Area

Antelope Valley, which is located in parts of Kern, Los Angeles, and San Bernardino Counties in the western part of the Mojave Desert, is about 50 mi northeast of Los Angeles (fig. 1). The valley is bounded on the south by the southeast-trending San Gabriel Mountains and on the northwest by the northeast-trending Tehachapi Mountains. The northern and eastern boundaries of the valley are formed by lower hills, ridges, and buttes. The valley is a topographically closed basin and the valley floor slopes gently toward several playas; surface-water runoff terminates in these playas. The altitudes of the valley floor, the interior hills, and the foothills range from 2,270 to 3,500 ft above sea level, and the surrounding mountains rise as high as 10,064 ft above sea level.

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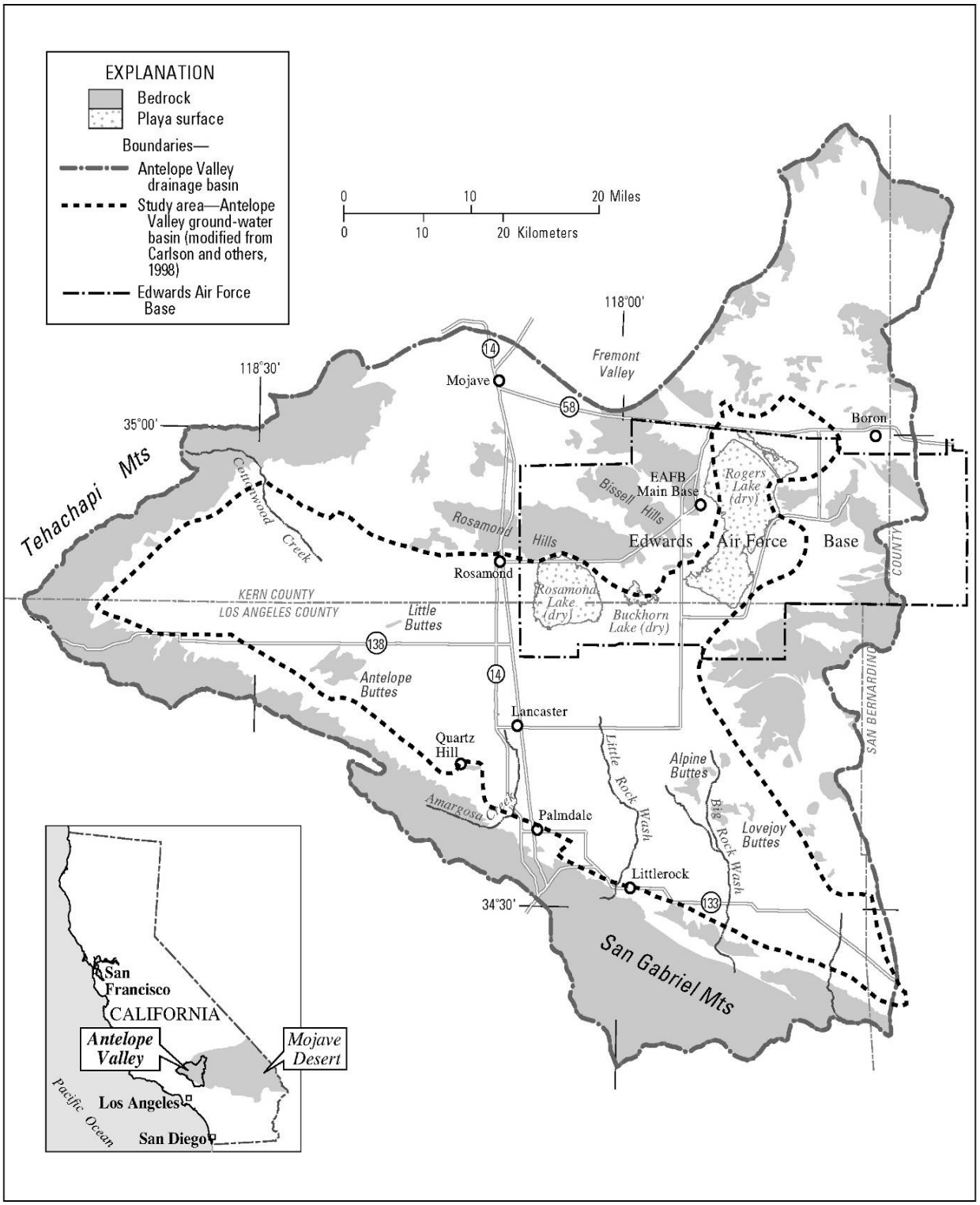

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Figure 1. Location of study area, Antelope Valley, California.

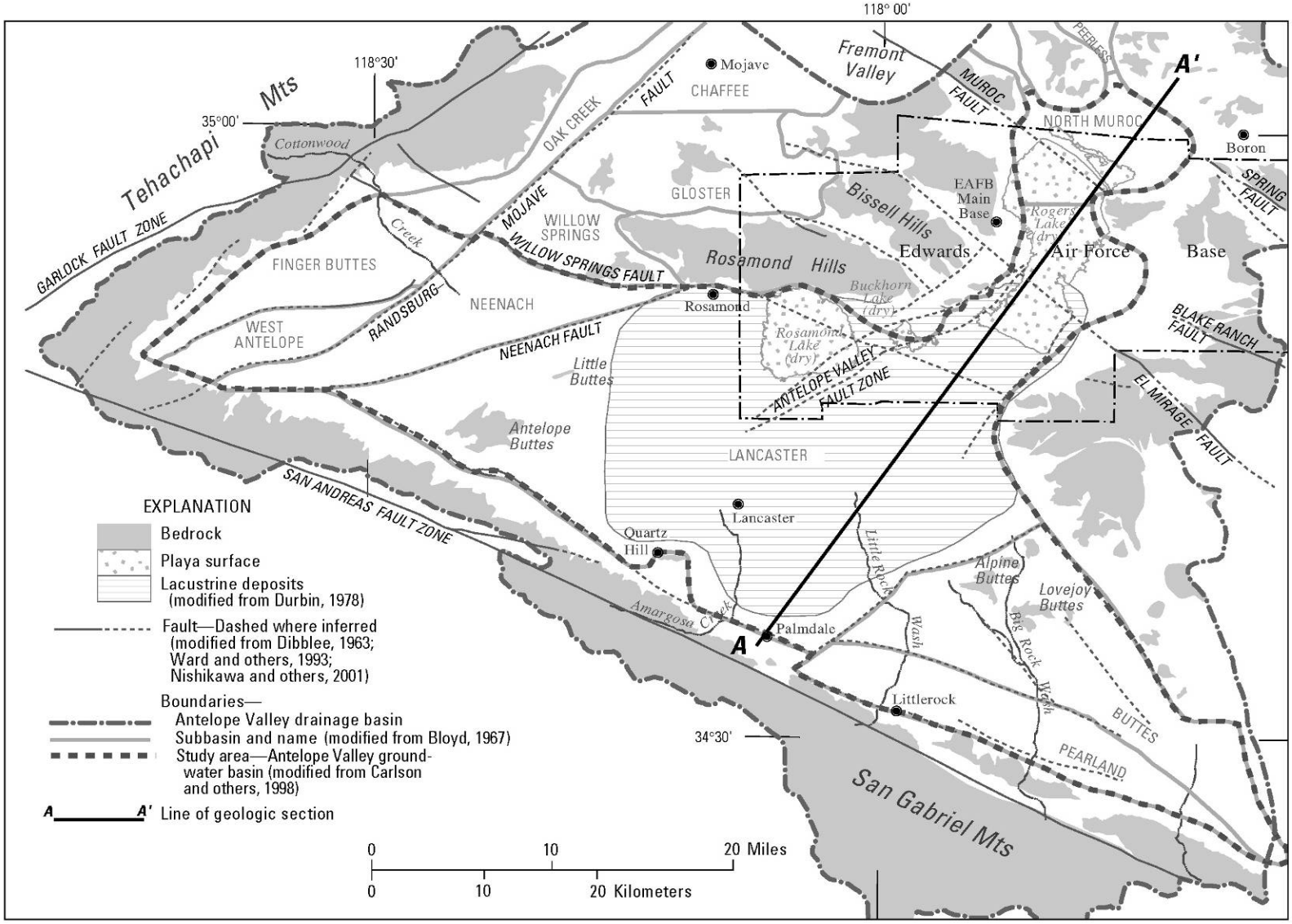

Figure 2. Location of faults, ground-water subbasins, line of geologic section, and approximate areal extent of lacustrine deposits in the Antelope Valley ground-water subbasin, California.

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The climate in the study area is semiarid to arid. Average annual precipitation in the interior of the valley is less than 10 in. (Rantz, 1969), humidity is low, and temperatures range from below 32°F in the winter to more than 100°F in the summer. Most precipitation occurs between October and March. Land use in the valley is primarily urban, agricultural, industrial, and military. Lancaster and Palmdale are the largest cities in the valley; in 1988, they had a combined population of about 244,000 (California Department of Finance, 1998).

The Antelope Valley ground-water basin, which is the focus of this report, was defined by Carlson and others (1998) and is part of the Antelope Valley drainage basin (fig. 2). The Antelope Valley drainage basin has been divided into 12 ground-water subbasins (fig. 2) on the basis of faults, consolidated rocks, ground-water divides, and, in some cases, arbitrary boundaries (Thayer, 1946; Bloyd, 1967). The Antelope Valley ground-water basin covers about 920 mi^2, and consists of seven of these subbasins; the Buttes, Finger Buttes, Lancaster, Neenach, North Muroc, Pearland, and West Antelope (fig. 2). The Lancaster subbasin is the largest and most developed of the subbasins.The Antelope Valley ground-water basin is separated from the northern part of Antelope Valley by faults and low-lying hills. Most of the urban and agricultural development and associated ground-water pumping in Antelope Valley occurs within the study area.

Acknowledgments

The authors gratefully acknowledge the members of the Antelope Valley Water Group for their assistance during this study. They provided data, local knowledge, and advice that were important to the successful completion of the study. We also thank Loren Metzger of the USGS for his invaluable assistance in compiling the water-use data.

GEOHYDROLOGY

The geohydrology of Antelope Valley is described in detail by previous investigators. The general geologic structure of Antelope Valley was inferred on the basis of a gravity survey by Mabey (1960). The surficial geology of the valley was mapped and described by Dibblee (1952, 1957, 1958a, 1958b, 1959a, 1959b, 1959c, 1959d, 1960a, 1960b, 1963, 1967, 1981) and Noble (1953). Surveys by Johnson (1911) and Thompson (1929) provide information on ground-water conditions during the early ground-water development. Additional studies on the ground-water resources in Antelope Valley are documented in reports by Thayer (1946), the California Department of Water Resources (1947), the California Department of Public Works (1955), Snyder (1955), Dutcher and Worts (1963), Weir and others (1965), Bloyd (1967), Duell (1987), Londquist and others (1993), Rewis (1995), Carlson and others (1998), Carlson and Phillips (1998), and Nishikawa and others (2001). The geohydrology of Antelope Valley is summarized in the following sections, but the reader is referred to the aforementioned reports for a more detailed description.

Geologic Setting

Underlying Antelope Valley are large sediment-filled structural depressions that are downfaulted between the Garlock and the San Andreas Fault zones. The bedrock complex in the valley forms the margins and the base of the ground-water basin and crops out in the highlands that surround the valley. This bedrock complex consists of pre-Cenozoic igneous rocks and consolidated Tertiary sedimentary rocks (Hewett, 1954; Dibblee, 1963).

In the Antelope Valley ground-water basin, a series of unconsolidated deposits of Quaternary age, some more than 5,000 ft thick (Benda and others, 1960; Mabey, 1960; R.C. Jachens, U.S. Geological Survey, written commun., 1991), overlies consolidated rocks and forms the basin fill. On the basis of the mode of deposition, Dutcher and Worts (1963) mapped these deposits as either alluvial or lacustrine. The alluvium consists of unconsolidated to moderately indurated, poorly sorted gravels, sands, silts, and clays. The older deep units within the alluvium typically are more compacted and indurated than the younger shallow units (Dutcher and Worts, 1963; Durbin, 1978). The fine-grained lacustrine deposits consist of sands, silts, and clays that accumulated in a large lake or marsh that at times covered large parts of the study area (Dibblee, 1967). These lacustrine deposits consist primarily of thick layers of blue-green silty clay, known locally as the blue clay member of the lacustrine deposits

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(Dutcher and Worts, 1963), and a brown clay containing thin interbedded layers of sand and silt. Individual clay beds are as much as 100 ft thick and are interbedded with lenses of coarser material as much as 20 ft thick. The entire sequence of lacustrine deposits is as much as 300 ft thick in some areas (Dutcher and Worts, 1963). These deposits are overlain by as much as 800 ft of alluvium in the southern part of the Lancaster subbasin near Palmdale, become progressively shallower northward, and are exposed at the surface near the southern edge of Rogers Lake. Alluvial fans that were formed by the erosion of materials from the San Gabriel Mountains encroached upon an ancient lake where the lacustrine deposits were accumulating, forcing the the ancient lake, and associated lacustrine deposits, northward with time (Durbin, 1978). The areal extent of the lacustrine deposits is not well defined, but its approximate extent is shown in figure 2.

Antelope Valley contains numerous faults (fig. 2), some of which act as partial barriers to ground-water flow. Most of these faults are described in reports by Mabey (1960), Dibblee (1960b, 1963), Dutcher and Worts (1963), and Ward and others (1993). More recent data and analysis have extended previously described faults and identified a previously unknown fault. Nishikawa and others (2001) suggest that the Muroc and the El Mirage Faults extend across Rogers Lake (fig. 2); the extensions of these faults were based on water-level data and results from sub-regional ground-water flow simulations. Nishikawa and others (2001) also identified a fault that trends from the northwest corner of Rosamond Lake southeast along the southern edge of Buckhorn Lake to the eastern edge of the study area (fig. 2). This fault, which may be an extension of the Willow Springs Fault, was inferred on the basis of water-level data; water levels are as much as 65 ft lower on the northeast side of the fault than on the southwest side. Large water-level differences between nearby wells in the Buttes subbasin suggest the existence of a previously unknown fault; this fault is thought to trend southeast of Lovejoy Buttes, parallel to the northeastern boundary of the Buttes subbasin (fig. 2).

Aquifer System and Boundaries

The lateral boundaries of the Antelope Valley ground-water basin are formed, in most cases, by shallow or exposed bedrock. North of the Finger Buttes and the Neenach subbasins, the boundary of the ground-water basin is formed by the Willow Springs Fault (fig. 2). This fault is assumed to be an effective barrier to ground-water flow to and from subbasins to the north (Durbin, 1978). This assumption is supported by evidence that springs existed along the fault prior to ground-water development and, more recently, by large water-level differences over short distances across the fault (Carlson and others, 1998).

The historical conceptual model of the aquifer system in the Antelope Valley ground-water basin utilized a lithostratigraphic approach to divide the basin sediments into two major aquifers; an upper unconfined aquifer known locally as the "principal" aquifer and a "deep" aquifer overlain and confined by lacustrine deposits (Dutcher and Worts, 1963; Bloyd, 1967; Durbin, 1978). The principal aquifer was defined as the aluvial deposits that overlie the lacustrine deposits in the Antelope Valley ground-water basin south and west of Rogers Lake. The principal aquifer was assumed to be unconfined throughout its entire extent. The deep aquifer was defined as the alluvial deposits that underlie the lacustrine deposits throughout the Antelope Valley ground-water basin and the lacustrine and alluvial deposits in the Antelope Valley ground-water basin east and north of Rogers Lake. The deep aquifer was assumed confined in areas where it is overlain by the lacustrine deposits and unconfined to semiconfined in the Rogers Lake area where the principal aquifer and lacustrine deposits were assumed not to exist.

Paleomagnetic analyses of core samples collected during the drilling of monitoring site 7N/12W-27P5–8, south of Lancaster, indicate a change from normal polarity at 344 ft below land surface to reversed polarity at 450 ft below land surface (Fram and others, 2002). This reversal in polarity is interpreted as the transition from the Brunhes to the Matuyama polarity-chronostratigraphic units (John Hillhouse, U.S. Geological Survey, written commun., 1998), which occurred about 780,000 years ago (Cande and Kent, 1995). The lacustrine deposits were

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encountered at a depth of about 740 ft below land surface at the monitoring site, indicating that these deposits are significantly older than 780,000 years. In contrast, the lacustrine deposits collected from less than 100 ft below land surface at Edwards Air Force Base interfinger with alluvial deposits less than 14,000 years old (Ponti, 1985).Therefore, the historical conceptual model groups alluvial deposits that are younger than 14,000 years with deposits that are older than 780,000 years in the same aquifer. In general, the alluvial deposits become more consolidated and indurated (hardened) with age, which decreases the ability of the aquifer material to transmit and store water. Because the hydraulic properties of the alluvial deposits change with time, the grouping of deposits of significantly different ages into the same aquifer is probably not reasonable.

Stratigraphic, hydrologic, and water-quality data collected since the early 1990s (Londquist and others, 1993; Rewis, 1993; Metzger and others, 2002) were used in this study to redefine the conceptual mode of the Antelope Valley ground-water basin. The new conceptual model utilizes a chronostratigraphic approach instead of a lithostratigraphic approach to divide the ground-water basin into an upper, middle, and lower aquifer. Lithologic and geophysical logs of wells drilled in Lancaster (Metzger and others, 2002) and at Edwards Air Force Base south of Rogers Lake (Londquist and others, 1993; Rewis, 1993) indicate that the alluvial deposits become less permeable and more indurated at approximately 1,950 and 1,550 ft above sea level. These changes in properties were assumed to represent chronostratigraphic boundaries and were used to divide the ground-water basin into the three aquifers. The upper aquifer extends from the water table to an altitude of about 1,950 ft above sea level, the middle aquifer extends from 1,950 to 1,550 ft above sea level, and the lower aquifer extends from 1,550 ft above sea level to the altitude at which bedrock is encountered (fig. 3). Geophysical data are limited or nonexistent elsewhere in the basin and thus it was assumed that these changes in properties of the alluvium with depth were laterally extensive throughout the basin. The lacustrine deposits were assumed to be included in these aquifers.

The upper aquifer varies from unconfined to confined depending on the presence and vertical position of the thick lacustrine deposits within the aquifer. In the south part of the Lancaster subbasin, from Palmdale to where Little Rock Wash crosses section A-A′, the lacustrine deposits are below the upper aquifer, and the upper aquifer generally is unconfined. The upper aquifer may be locally confined in this area and in areas outside the extent of the lacustrine deposits owing to the presence of discontinuous interbedded aquitards. North of Little Rock Wash, the lacustrine deposits are present at shallower depths and are considered a part of the upper aquifer. In the northern part of the study area around Rogers Lake, the lacustrine deposits are exposed at land surface and form the upper part of the upper aquifer. In these areas where the lacustrine deposits are a part of the upper aquifer, the upper aquifer is confined below the lacustrine deposits.

In the southern part of the Lancaster subbasin, where the lacustrine deposits are deepest, the lacustrine deposits are part of the middle aquifer; but in the northern part of the subbasin, these deposits overlie the middle aquifer. Owing to the overlying lacustrine deposits and the discontinuous interbedded aquitards, the middle aquifer is assumed confined. If water levels were to decline below the confining aquitards, the middle aquifer could become unconfined in places.

The alluvium in the lower aquifer becomes increasingly consolidated and indurated with depth and, in the deepest parts of the basin, probably is able to transmit and store only small quantities of water. The lacustrine deposits overlie this aquifer except possibly in areas around Palmdale and Lancaster where the lacustrine may be partly contained within the lower aquifer. The lower aquifer is confined by the overlying lacustrine deposits and the discontinuous interbedded aquitards in the middle aquifer.

Pre-Development Conditions

Prior to ground-water development in Antelope Valley, long-term ground-water conditions in the study area were in a state of dynamic equilibrium. That is, on a time scale of several years or decades, average annual natural recharge to the basin was balanced by average annual natural discharge, and ground-water levels generally fluctuated about long-term mean water levels that remained constant over time. Although the equilibrium of recharge and discharge was affected by dry and wet climatic cycles, the equilibrium was maintained over the long term.

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Recharge

The primary source of natural recharge to the basin is infiltration of precipitation runoff from the surrounding mountains (primarily from the San Gabriel Mountains south of the valley) in ephemeral stream channels. This recharge, defined as mountain-front recharge, generally occurs at the heads of the alluvial fans and along the stream channels near where the streams enter the valley (fig. 4). During periods of high runoff, these streams can flow onto the valley floor, which may result in some recharge along stream channels and washes. Other sources of natural recharge include direct infiltration of precipitation and lateral ground-water underflow from adjacent bedrock areas and basins, both of which probably are small compared with mountain-front recharge. Precipitation over the valley floor generally is less than 10 in./yr (Rantz, 1969) and evapotranspiration rates [pan evaporation rate is about 114 in./yr (Bloyd, 1967)] and soil moisture requirements are high; therefore, recharge from direct infiltration of precipitation is negligible (Snyder, 1955; Durbin, 1978). Lateral ground-water flow from fractures in adjacent bedrock, from the Willow Springs subbasin south across the Willow Springs Fault, and from other areas adjacent to the study area also may recharge the basin, but the quantity of recharge from these sources is unknown and probably is negligible (Bloyd, 1967).

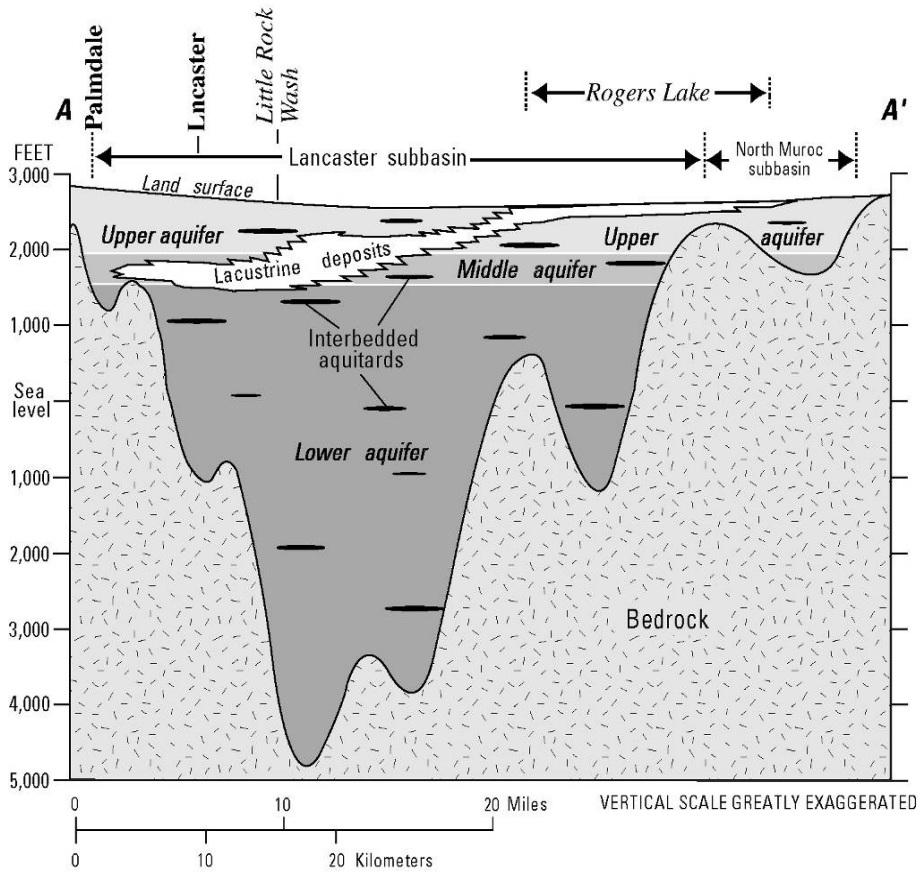

Figure 3. Generalized geologic section showing relation of lacustrine deposits to aquifers in the Lancaster and the North Muroc subbasins in the Antelope Valley ground-water basin, California (modified from Londquist and others, 1993). Line of section is shown on figure 2.

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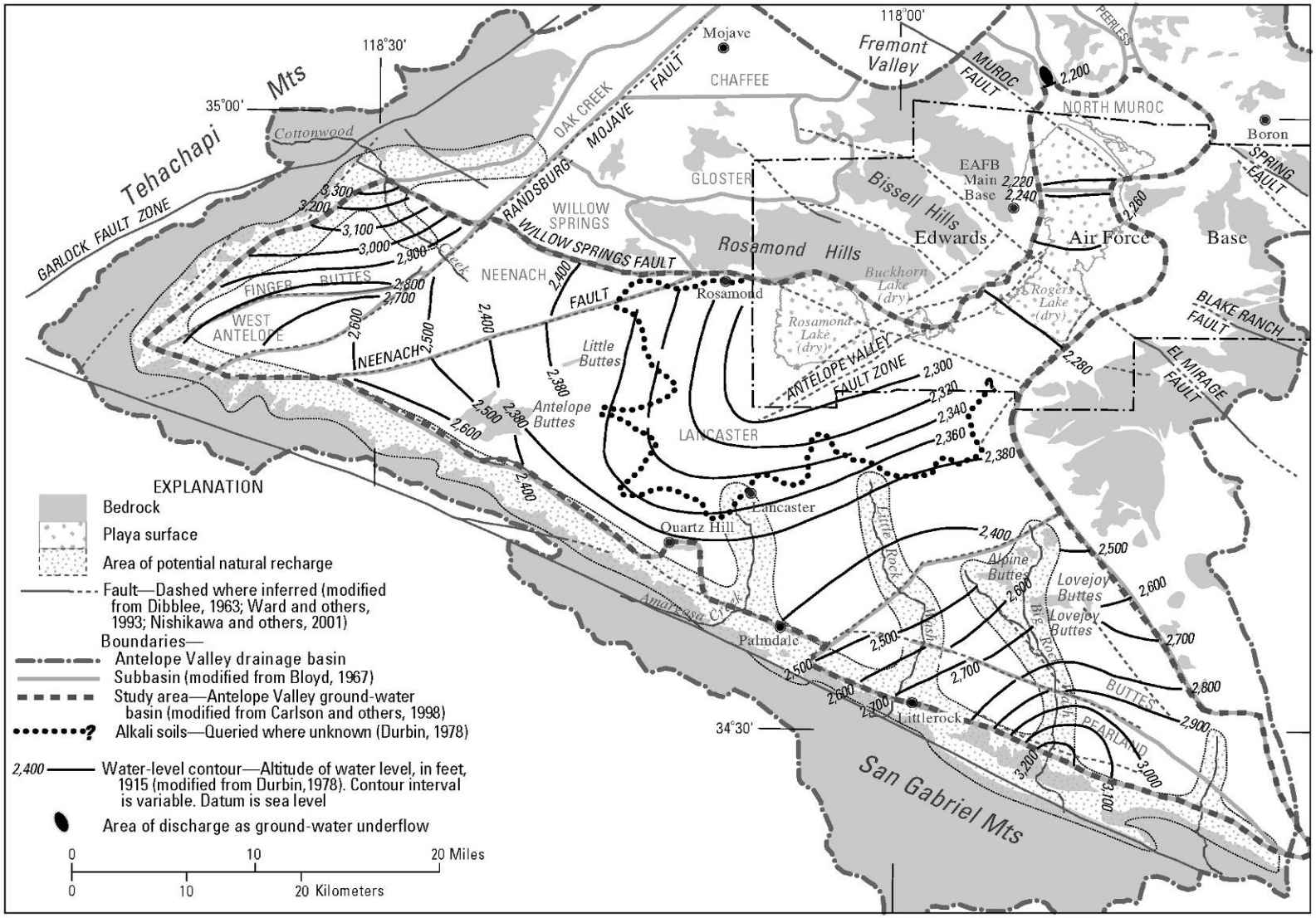

Figure 4. Ground-water levels in 1915 and location of areas of potential natural recharge, natural discharge as ground-water underflow, and alkali soils in the Antelope Valley ground-water basin, California.

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The quantity of mountain-front recharge in Antelope Valley was estimated during previous investigations: all estimates were based on rainfall, runoff, and channel-geometry data. Londquist and others (1993) summarized these estimates and concluded that those by Bloyd (1967) and Durbin (1978) probably are the most representative of actual recharge in the valley because their estimates were based on long-term discharge and climatological data. Bloyd (1967) estimated that annual mountain-front recharge was about 58,000 acre-ft using a surface-water drainage area of the entire Antelope Valley (558 mi^2). Durbin (1978) estimated that the annual mountain-front recharge was about 40,700 acre-ft, which is based on the surface-water drainage area of the Antelope Valley ground-water basin (385 mi^2). Bloyd's (1967) and Durbin's (1978) estimates resulted in similar values for mountain-front recharge—104 and 106 acre-ft/mi^2 of surface-water drainage area, respectively. Applying Bloyd's (1967) estimate of recharge per square mile to the surface-water drainage area used by Durbin (1978) resulted in an estimated annual mountain-front recharge of about 40,040 acre-ft for the Antelope Valley ground-water basin, which is similar to Durbin's (1978) estimate of annual mountain-front recharge (40,700 acre-ft). Results from a study of the infiltration of surface runoff in the Mojave River Basin (Izbicki and others, 1995), which is immediately east of Antelope Valley, indicate that recharge from surface runoff in ephemeral streams is limited in this arid environment. Izbicki and others (1995) used water-quality analyses, ground-water age-dating techniques, and ground-water flow modeling to estimate recharge. The results from Izbicki and others (1995) suggest that natural recharge in the Antelope Valley ground-water basin may be less than that estimated by Bloyd (1967) and Durbin (1978).

Discharge

The primary source of discharge of water from the basin prior to ground-water development was from evapotranspiration in the lower parts of the valley where the water table was within 10 ft of land surface (Lee, 1912). The pan evaporation rate in Antelope Valley is about 114 in./yr (Bloyd, 1967) and represents the upper limit of bare-soil evaporation. A large area of alkali soils (fig. 4) (Durbin, 1978) and the existence of phreatophytes in the north central part of the ground-water basin, which require saturated soil within the root zone, indicate that the water table was near land surface at one time and that evapotranspiration was significant (Thompson, 1929). Evapotranspiration by mesquite, a common phreatophyte in the study area, ranges between 0.1 and 1.4 ft/yr, depending on areal density (Lines and Bilhorn, 1996). Durbin (1978) estimated that prior to ground-water development, discharge from the basin owing to evapotranspiration was about 39,400 acre-ft/yr; he based this estimate on a mass balance. Other types of discharge from the basin included lateral ground-water underflow and springs. Bloyd (1967) and Durbin (1978) stated that ground-water underflow occurred through a gap in the bedrock in the northwest corner of the North Muroc subbasin into the Fremont Valley Basin. Bloyd (1967) estimated that 100 to 500 acre-ft/yr and Durbin (1978) estimated that about 1,000 acre-ft/yr flowed through this gap. Discharge by springs was thought to be less than 300 acre-ft/yr (Johnson, 1911; Thompson, 1929).

Post-Development Conditions

Development of the ground-water resource in Antelope Valley has caused significant changes in the amount, distribution, and type of recharge and discharge. New sources of recharge include irrigation return flow and infiltration of treated wastewater, and the primary source of discharge, evapotranspiration, has been replaced by ground-water pumping.

Recharge

Since the development of irrigated agriculture in the Antelope Valley ground-water basin, large amounts of irrigation water have been applied to crops; much of this water may have percolated below the root zone and contributed recharge to the ground-water basin. Snyder (1955) reported that agricultural recharge probably reached the water table by the early 1950s. Durbin (1978), however, assumed that this water had not reached the water table in 1961 based on water-quality data, which indicated that the dissolved-solids concentration in ground water had not changed. He reported that the existence of layers of fine-grained material above the water table may have prevented or delayed the downward migration of this water. Durbin (1978) also reported that the concentration of dissolved solids started to increase in the 1960s, which indicated that irrigation water may have begun to reach the water

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table. Rising water levels and high nitrate concentrations in areas that historically have been used for agricultural production since the mid 1970s support the assumption that infiltration of irrigation water has contributed recharge to the ground-water basin.

Infiltration of treated wastewater may also contribute recharge to the ground-water basin. The largest producers of treated wastewater in the study area are the Palmdale Water Reclamation Plant and the Lancaster Water Reclamation Plant (Templin and others, 1995). Beginning in 1975, treated wastewater has been disposed of in ponds or on spreading grounds (areas where water is spread over the land surface to evaporate or infiltrate below land surface). A small amount of the treated wastewater is reclaimed and used primarily for agriculture (Templin and others, 1995). The quantity of disposed wastewater available for infiltration and potential recharge was estimated by subtracting estimated evaporation from the quantity of treated wastewater that is disposed of in ponds or on spreading grounds (David Lambert, County Sanitation District of Los Angeles County, written commun., 1996). Treated wastewater from the Palmdale Water Reclamation Plant is spread on approximately 60 acres of land. At the Lancaster Water Reclamation Plant, treated wastewater is disposed of in ponds that encompass about 430 acres. On the basis of a pan evaporation rate of 114 in./yr (9.5 ft/yr) for Antelope Valley (Bloyd, 1967), about 570 acre-ft/yr of the treated wastewater from the Palmdale Water Reclamation Plant and about 4,085 acre-ft/yr of the treated wastewater from the Lancaster Reclamation Plant is lost to evaporation. The annual quantity of treated wastewater discharged to spreading ponds and the estimated potential annual infiltration of wastewater in the ponds are shown in table 1. Results of studies at the Lancaster Water Reclamation Plant indicate that infiltration of the ponded water probably does not reach the regional water table owing to the high clay content of the sediments (David Lambert, County Sanitation District of Los Angeles County, written commun., 1996).

Table 1. Annual treated wastewater discharged to ponds and spreading grounds, and potential annual infiltration of the treated wastewater in the Antelope Valley ground-water basin, 1975–95

[Discharge data from David Lambert (County Sanitation Districts of Los Angeles County, written commun., 1996). acre-ft, acre-feet. —, no data]

Year	Lancaster Water Reclamation Plant		Palmdale Water Reclamation Plant	
	Wastewater discharge (acre-ft)	Potential infiltration of wastewater (acre-ft)	Wastewater discharge (acre-ft)	Potential infiltration of wastewater (acre-ft)
1975	840	0	—	—
1976	1,280	0	—	—
1977	1,700	0	—	—
1978	2,160	0	—	—
1979	1,980	0	—	—
1980	2,170	0	—	—
1981	2,320	0	—	—
1982	2,120	0	—	—
1983	2,770	0	—	—
1984	2,590	0	1,100	530
1985	3,090	0	2,000	1,430
1986	4,210	125	2,580	2,010
1987	5,140	1,055	3,510	2,940
1988	3,660	0	3,730	3,160
1989	2,100	0	3,960	3,390
1990	2,270	0	5,440	4,870
1991	2,410	0	5,110	4,540
1992	3,400	0	6,150	5,580
1993	5,150	1,065	7,080	6,510
1994	4,980	895	7,480	6,910
1995	7,000	2,915	8,070	7,500

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Mountain-front recharge is affected by climatic conditions, which have not changed significantly during the years represented by this study. On the basis of the limited data available on mountain-front recharge, we assumed that the quantity of mountain-front recharge probably has remained fairly constant over time. However, the encroachment of land development into areas where mountain-front recharge occurs may affect this source of recharge. Lateral ground-water flow from adjacent areas is being affected by changes in the water-level gradient, but the quantity of lateral flow is small and the changes in this component of natural recharge have little effect on total natural recharge in the basin.

Discharge

The primary form of discharge from the ground-water basin is ground-water pumpage. The use of ground water for irrigation in the Antelope Valley began in the 1800s; but, until about 1915, the quantity of ground-water pumpage was small. Beginning in 1915, the number of wells drilled in Antelope Valley increased significantly resulting in increases in annual pumpage. Historical pumpage was estimated by Snyder (1955), Durbin (1978), California Department of Water Resources (1980, 1990, and 1991), and Templin and others (1995); their estimates are presented in figure 5 along with estimates calculated for this current study. The large differences in the estimates of pumpage may be due to differences in the methods used to estimate pumpage and in the area represented by the estimate. In 1919, pumpage was estimated to be about 31,000 acre-ft (California Department of Water Resources, 1980). By the early to mid 1950s, pumpage had increased to its highest levels; estimates of peak annual pumpage ranged from about 260,000 acre-ft/yr (Templin and others, 1995) to about 480,000 acre-ft/yr (California Department of Water Resource, 1980). The pumpage database developed by Templin and others (1995) underestimates the pumpage in the ground-water basin, because it does not include agricultural pumpage estimates for the Kern County part of the study area. Increased pumping costs owing to increased pumping lifts and rising electricity costs resulted in a decline in pumpage beginning in the mid 1950s. In 1972, imported water from northern California became available further reducing the demand for ground water.

Owing to the differences and uncertainties in the previous estimates of pumpage and the incomplete record for the model period (1915–95), annual pumpage was recalculated for this study (fig. 5). The revised estimates, which were calculated using the previous estimates and the new data collected during this study, indicate that pumpage reached a high of 395,000 acre-ft in 1951 and a modern (post 1915) low of 70,600 acre-ft in 1990. Pumpage for the period 1915–51 was based on the estimates of Snyder (1955). Snyder (1955) estimated pumpage for 1924–51 using both annual power-consumption data and crop consumptive-use data for intermittent years. The estimates of pumpage from these data were nearly equal (fig. 5), and were assumed valid for this study. The pumpage for 1952–95 was calculated for this study using irrigated crop acreage data, crop consumptive-use data, and data from the pumpage database created by Templin and others (1995).

Owing to the known limitations in the agricultural component of the pumpage data in the pumpage database created by Templin and others 1995), only the public-supply data from the pumpage database presented by Templin and others (1995) were used for 1952–95 estimates presented in this study. Pumpage for public supply is metered and therefore was assumed to be well documented in the pumpage database. Data compiled from public-supply agencies support this assumption. Pumping of small quantities of ground water for domestic use occurs in the study area, but, because it was not measured, it was not included in estimates of annual pumpage.

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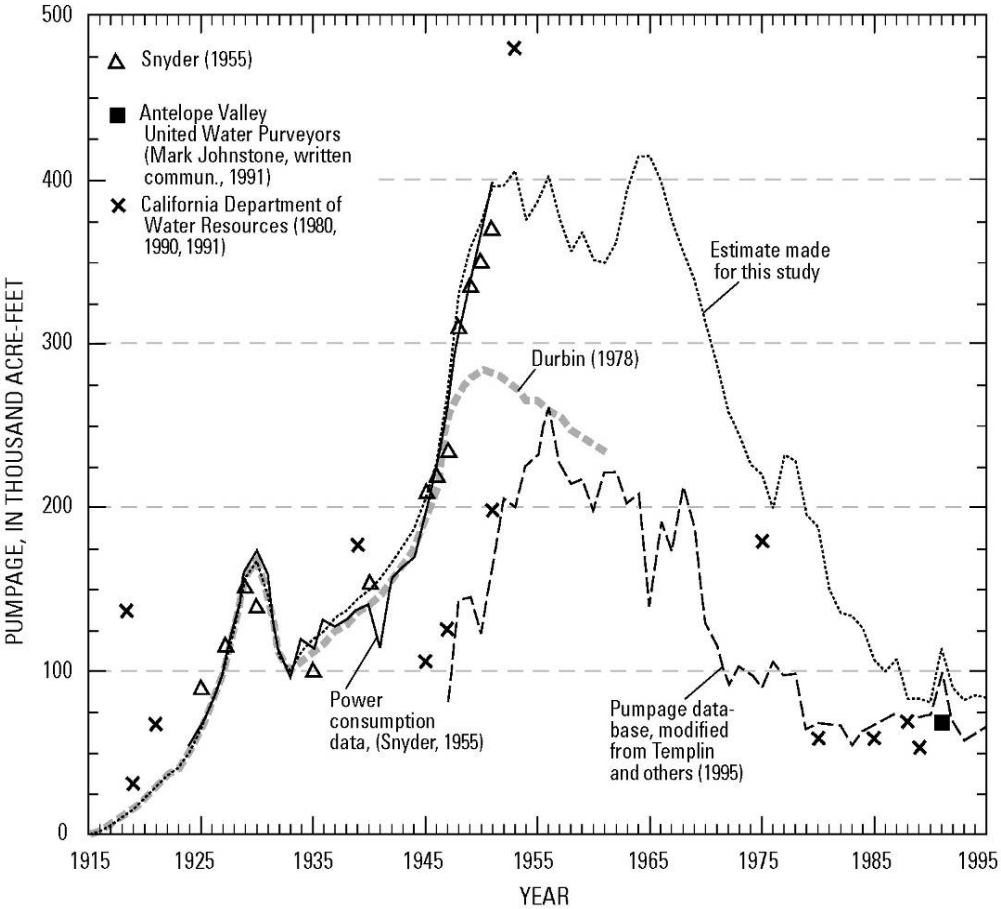

Figure 5. Estimated ground-water pumpage in Antelope Valley, California, 1915–95.

Table 2. Unit consumptive use of crops grown in Antelope Valley, California, 1952–95

[Unit consumptive use in acre-feet per acre; CDPW, California Department of Public Works; CIMIS, California Irrigation Management Information System; UCCE, University of California Cooperative Extension. —, no data]

Crop	Source			
	Snyder (1955)	CDPW (1955)	Templin and others (1995)	CIMIS/ UCCE [1] (1994)
Alfalfa	3.37	3.6	4.3	4.8
Pasture	3.18	3.4	4.3	4.8
Orchard	2.6	2.8	2.6	—
Sugar beets	2.54	2.6	—	—
Field crops	2.1	2.1	2.2	—
Truck crops	1.92	2.0	1.5	—

[1] Reference evapotranspiration (ET_o) × crop coefficient (K_c) [ET_o from California Irrigation Management Information System (CIMIS) (2001) and K_c from University of California Cooperative Extension (1994)].

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The agricultural component of annual pumpage for 1952–95 was estimated by calculating the total annual crop consumptive use from irrigated crop acreage data obtained from the Los Angeles County Agricultural Commissioner and unit consumptive-use data for the crops. Unit consumptive use is defined as the quantity of water, in acre-feet, used per acre of crop grown. Published estimates of the unit consumptive use of crops grown in Antelope Valley (table 2) are from the California Department of Public Works (1955), Snyder (1955), and Templin and others (1995). The estimates reported by Templin and others (1995) were from the California Department of Water Resources (CDWR). Estimates also were calculated for the unit consumptive use of alfalfa and pasture (table 2); these estimates were calculated using crop coefficients (University of California Cooperative Extension, 1994) and the reference evapotranspiration rate for Antelope Valley. The reference evapotranspiration rate data are from the California Irrigation Management Information System (CIMIS), a repository of climatological data used for irrigation management and operated by the CDWR.

CIMIS uses local climatological data to determine a reference evapotranspiration rate (ET_o) for unstressed (well-watered) pasture. The unit consumptive use (ET_c) for a given crop is calculated as the product of ET_o and the crop coefficient (K_c) that relates the evapotranspiration rate of the given crop to a reference crop (pasture). The normal year ET_o for the ground-water basin was estimated by averaging the normal year ET_o data for Lancaster and Palmdale obtained from CIMIS. For this study, ground-water pumping for irrigation of alfalfa was assumed to occur only from March through October: the total ET_o for these months in a normal year is 4.8 ft. The University of California Cooperative Extension (1994) reports that the K_c for alfalfa ranges from 0.4 to 1.2, depending on the stage of growth, but that some researchers recommend using a K_c value of 1.0 for alfalfa. A K_c value of 1.0 was used for this study, which resulted in a unit consumptive use of 4.8 ft, which was the same as that for pasture.

The ET_c values for orchard, sugar beets, and field crops are consistent among the sources shown in table 2. The ET_c values estimated by Snyder (1955) for these crops were used to calculate the annual consumptive use of these crops for 1952–95 so that the values were consistent with those used by Snyder (1955) to estimate agricultural pumpage for 1915–51. Because the estimates of ET_c for alfalfa and pasture are not consistent among the sources shown in table 2, the annual consumptive use for alfalfa and pasture for 1952–95 was calculated using the ET_c values estimated from K_c and ET_o data. The ET_c for alfalfa and pasture (4.8 acre-ft/acre) was used to calculate annual consumptive use for 1952–95 because these values were based on the most current crop consumptive-use studies. However, annual consumptive-use estimates for alfalfa and pasture were not recalculated for 1915–51 using the current unit consumptive-use values of 4.8 acre-ft/acre because annual crop acreage data were not available for this period.

Annual crop acreage data for 1952–95 are shown in table 3. Onions were assumed to be a field crop and, therefore, the ET_c for field crops reported by Snyder (1955) (table 2) was used to calculate the total annual consumptive use of onions. The total annual crop consumptive use in the study area for 1952–95 (table 3) was calculated using the following equation:

$$CU_T = (A_{alf} \times CU_{alf}) + (A_{past} \times CU_{past}) + (A_{orch} \times CU_{orch}) + (A_{beets} \times CU_{beets}) + (A_{onions} \times CU_{onions}) \quad (1)$$

where

CU_T	is the total annual crop consumptive use $[L^3]$,
A_{alf}	is the area of irrigated alfalfa $[L^2]$,
CU_{alf}	is the unit consumptive use for alfalfa [L],
A_{past}	is the area of irrigated pasture $[L^2]$,
CU_{past}	is the unit consumptive use for pasture [L],
A_{orch}	is the area of irrigated orchards $[L^2]$,
CU_{orch}	is the unit consumptive use for orchards [L],
A_{beets}	is the area of irrigated sugar beets $[L^2]$,
CU_{beets}	is the unit consumptive use for beets [L],
A_{onions}	is the area of irrigated onions $[L^2]$, and
CU_{onions}	is the unit consumptive use for onions [L].

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Table 3. Crop area acreage, annual crop consumptive use, and total applied water used for irrigation in the Los Angeles County part of Antelope Valley, California, 1952–95

[Crop area data from Los Angeles County Agricultural Commissioner (1952–95), written commun.]

Year	Crop area, in acres					Total annual crop consumptive use, in thousand acre-feet	Total applied water, in thousand acre-feet
	Alfalfa	Orchard	Pasture	Onions	Beets		
1952	36,000	3,408	4,108	0	0	199.8	285.5
1953	36,400	3,530	4,300	0	0	202.8	289.8
1954	33,200	3,616	4,400	0	0	188.2	268.8
1955	34,800	3,830	4,060	0	0	196.0	280.0
1956	35,900	3,740	4,000	70	0	200.8	286.9
1957	34,000	2,645	3,700	140	0	185.8	265.4
1958	31,800	2,644	3,800	415	0	176.1	251.5
1959	32,600	2,716	3,800	640	0	180.7	258.2
1960	32,500	2,772	1,900	670	0	175.7	250.9
1961	32,000	2,396	1,800	50	435	171.0	244.3
1962	32,000	2,432	1,600	50	2,125	174.9	249.9
1963	36,500	2,470	1,400	90	2,150	196.3	280.5
1964	38,000	2,420	1,700	100	2,660	205.4	293.4
1965	38,000	2,384	2,000	160	1,466	203.1	290.1
1966	36,000	2,385	2,000	170	1,470	193.5	276.5
1967	34,000	2,088	2,000	0	1,660	182.6	260.9
1968	32,000	2,097	1,800	80	1,584	172.5	246.5
1969	30,000	1,838	1,500	0	1,520	160.6	229.4
1970	27,700	1,855	1,500	60	1,500	149.7	213.9
1971	25,400	1,867	1,000	0	1,500	137.3	196.1
1972	22,400	1,591	1,000	80	1,500	121.7	173.9
1973	21,400	1,590	400	240	1,220	115.0	164.3
1974	19,800	1,540	400	250	1,070	106.7	152.4
1975	19,000	1,393	400	700	1,200	103.4	147.8
1976	20,000	1,162	375	1,200	1,868	109.8	156.9
1977	23,000	1,162	375	2,500	3,700	131.6	188.0
1978	23,000	1,180	400	1,700	3,200	128.8	184.0
1979	22,800	1,219	0	1,715	2,200	124.5	177.8
1980	22,500	1,349	100	425	3,860	125.4	179.2
1981	20,000	1,015	100	977	2,775	110.2	157.5
1982	16,200	1,046	100	1,433	340	86.9	124.2
1983	13,757	1,104	200	1,810	317	76.5	109.2
1984	12,176	820	0	1,477	260	66.1	94.5
1985	10,671	852	0	1,580	0	58.6	83.8
1986	8,413	704	0	1,481	0	46.9	67.0
1987	8,895	700	0	1,497	0	49.2	70.3
1988	7,620	700	0	1,702	0	43.5	62.2
1989	6,300	800	0	1,675	0	37.6	53.7
1990	6,211	815	0	1,550	0	37.0	52.8
1991	5,768	705	0	1,690	0	34.6	49.5
1992	5,222	728	0	1,665	0	32.1	45.8
1993	5,532	738	0	1,564	0	33.4	47.7
1994	5,565	830	0	1,346	0	33.5	47.9
1995	5,480	842	0	1,669	0	33.9	48.4

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The total water applied for agriculture in the Los Angeles county section of the ground-water basin (table 3) was calculated by dividing total annual crop consumptive use by irrigation efficiency. Irrigation efficiency was assumed to be 70 percent on the basis of previous studies (California Department of Public Works, 1955; Snyder, 1955), a comparison of water application rates (Orloff and others, 1989), and crop consumptive-use rates for alfalfa (University of California Cooperative Extension, 1994). The actual irrigation efficiency likely is spatially and temporally variable and controlled by several factors including irrigation practices and soil characteristics; this variability was not represented in this study. The agricultural component of annual pumpage for 1952–95 was estimated by subtracting imported water, local surface-water diversions, and reclaimed wastewater used for agriculture from the total annual water applied for agriculture.

Records of annual irrigated crop acreage and agricultural pumpage are not available for Kern County and, therefore, estimated agricultural pumpage for that part of the study area was based on the relation between land use and ground-water use for 1961 and 1987. Land-use maps and agricultural pumpage data for Los Angeles County were used to estimate the quantity of ground-water pumpage per acre of agricultural land in 1961 and 1987. This ratio of pumpage per acre of agricultural land was then applied to agricultural land-use data for Kern County to estimate agricultural pumpage for the Kern County part of the study area for those years. In both 1961 and 1987, agricultural pumpage in the Kern County part of the study area was about 18 percent of the annual agricultural pumpage in the Los Angeles County part of the study area. This relation was assumed constant for the period 1952–95.

The spatial distribution of pumpage in the study area changed as agriculture declined in the late 1960s and 1970s and as urban areas grew in the 1980s. Data from the pumpage database were used to show changes in the spatial distribution of pumpage in the ground-water basin. Although the agricultural component of the pumpage database is known to be incomplete, it was assumed that the spatial distribution of pumpage in the database is representative of the spatial distribution of actual pumpage in the basin. Prior to the 1980s, ground water was pumped primarily for agricultural use and mainly in the western and eastern parts of the Lancaster subbasin (fig. 6*A*). Since the 1980s, much of the pumpage has been for urban use, and the pumping centers have shifted from agricultural areas to urban areas near Rosamond, Edwards Air Force Base, Lancaster, and Palmdale (fig. 6*B*).

Natural discharge from evapotranspiration is greatly affected by changes in water levels caused by ground-water pumping. The water table has declined to a depth at which natural discharge from evapotranspiration is minimal. As with natural recharge, natural discharge as ground-water underflow is affected by changes in water-level gradients, but ground-water underflow is only a small component of the overall water budget for the basin.

Ground-Water Levels and Movement

Prior to ground-water development, the depth to water in the Lancaster subbasin was less than or equal to 50 ft below land surface in most of the subbasin, and, in the areas around the playas, artesian conditions existed. In the western part of the Lancaster subbasin and in the southern part near Palmdale, the depth to water was about 200 ft below land surface. Data on the depth to water in the Buttes, Finger Buttes, Neenach, Pearland, and West Antelope subbasins are limited, especially for the upslope parts of the these subbasins. Available data indicate that the depth to water in these subbasins ranged from about 50 ft below land surface in the lower part of the Neenach subbasin to about 200 ft below land surface in the higher parts of the Buttes, Pearland, and Finger Buttes subbasins. In the North Muroc subbasin, depths to water ranged from 50 to 100 ft below land surface. Water-level altitudes were highest in the Finger Buttes (3,300 ft above sea level) and Pearland (3,200 ft above sea level) subbasins (fig. 4) and lowest around the playas in the northeast part of the Lancaster subbasin (2,300 ft above sea level) and in the North Muroc subbasin (2,200 ft above sea level) (fig. 4). Around the playas, water levels were near land surface, and ground water was discharged in these areas largely by evapotranspiration and springs.

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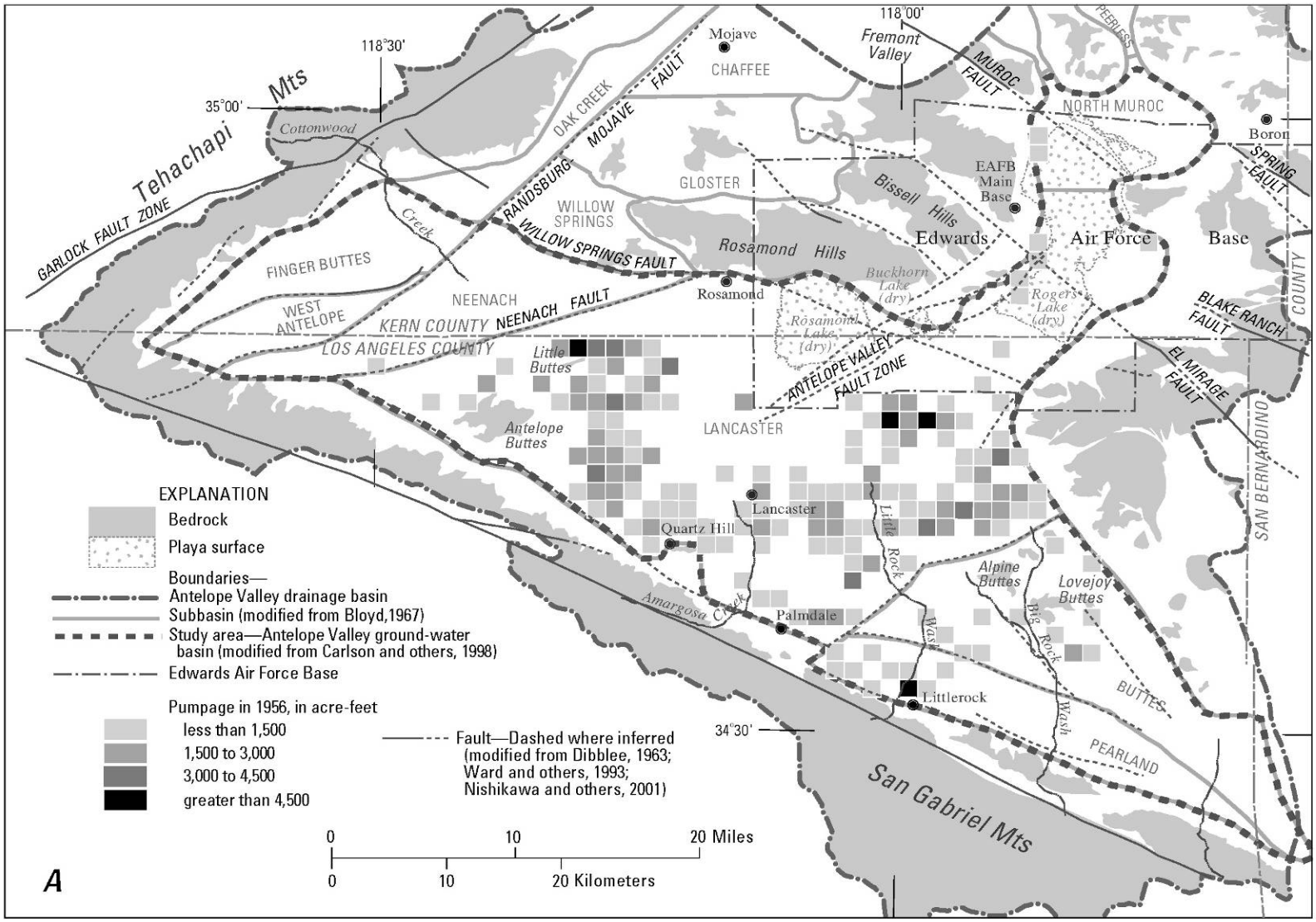

Figure 6. Distribution of pumpage in Antelope Valley, California. ***A***, 1956; ***B***, 1995.

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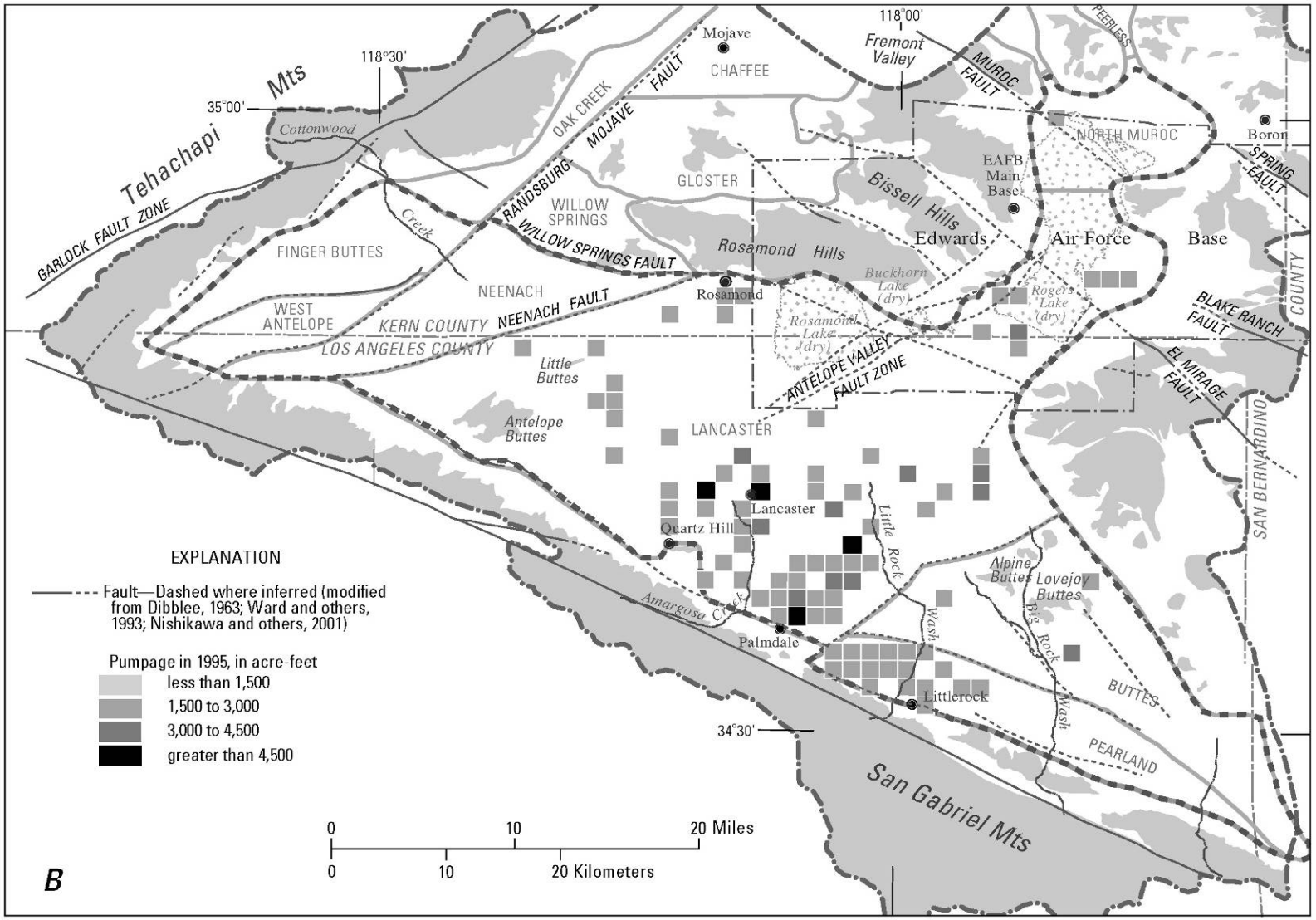

Figure 6.—Continued.

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Ground water moves from areas of high water-level altitudes to areas of low water-level altitudes; therefore, the general direction of ground-water flow can be inferred from contours of water level. Ground water flowed from areas of recharge along the mountain fronts and stream channels toward areas of discharge around Rosamond, Buckhorn, and Rogers Lakes (dry) (fig. 4). In the Finger Buttes and West Antelope subbasins, ground water generally moved from northwest to southeast. In the Neenach subbasin, ground water generally moved from west to east. In the Buttes and Pearland subbasins, ground water generally moved from southeast to northwest. In the Lancaster subbasin, ground water moved from the upslope areas in the southwestern, southern, and southeastern parts of the subbasin to the discharge areas in the northern and northeastern part of the subbasin. In the North Muroc subbasin, there was a small water-level gradient toward the north where some ground water flowed into the Fremont Valley Basin.

Since the 1920s, ground-water use has exceeded estimated natural recharge. This overdraft has caused water levels to decline by more than 200 ft in some areas and by at least 100 ft in most of the study area. In agricultural areas, declining water levels began to level off in the late 1970s and, in some areas, water levels began to rise. Since 1983, water levels have risen by as much as 45 ft in areas where land use is predominately agriculture (Carlson and others, 1998). In urban areas, water levels have continued to decline.

Water-level data collected in spring 1996 (Carlson and others, 1998) represent regional water levels after more than 75 years of ground-water development in the basin (fig. 7). In the Lancaster subbasin, depth to water is more than 100 ft below land surface throughout most of the subbasin and the water table has declined to a level that has eliminated the discharge of ground water by evapotranspiration. In the eastern and western parts of the subbasin where most of the agricultural pumping has occurred, depth to water is more than 200 ft below land surface; in some areas, depth to water is more than 300 ft below land surface. In the area around Palmdale, where most of the pumping for public supply has occurred, depth to water is more than 500 ft below land surface. In the Finger Buttes, Neenach, and West Antelope subbasins, depth to water ranges from about 150 ft to more than 350 ft below land surface. In the Buttes and Pearland subbasins, depth to water ranges from about 50 ft to about 250 ft below land surface, and in the North Muroc subbasin, depth to water ranges from about 100 ft to near 200 ft below land surface. Water-level altitudes are highest in the Neenach (2,800 ft above sea level) Pearland (2,800 ft above sea level) and Finger Buttes subbasins (data from a single data point in the Finger Buttes subbasin suggest that the water-level altitudes in this subbasin may be about 3,200 ft above sea level) (Carlson and others, 1998). The lowest water-level altitude is in the Lancaster subbasin in the area around Palmdale (2,050 ft above sea level) (fig. 7).

In the Neenach subbasin, ground water now moves to the northeast and flows into the Lancaster subbasin. In the Buttes and Pearland subbasins, ground water generally continues to move southeast to northwest. In the Lancaster subbasin, ground water flows from areas of natural recharge toward areas of low water-level altitude in the south-central part of this subbasin (fig. 7). Although not evident from the contours shown on figure 7, there also is an area of low water-level altitude centered near the primary production wells at Edwards Air Force Base, near the south end of Rogers Lake (Carlson and others, 1998); ground water flows from the boundary between the Lancaster and North Muroc subbasin toward this ground-water low (Rewis, 1995). An area of high water-level altitude exists in the central part of the Lancaster subbasin southwest of Rosamond Lake (fig. 7); the high water levels may be the result of limited agricultural pumping and low-permeability alluvial material in this area. Because pumping for agriculture has been limited, little drawdown has occurred over time. Recharge from the infiltration of wastewater from the Lancaster Water Reclamation Plant discharged to ponds in the area also may be contributing to the high water-level altitudes. In the North Muroc subbasin, the water-level gradient is fairly flat, but a small amount of water may continue to flow toward the Fremont Valley Basin from the North Muroc subbasin.

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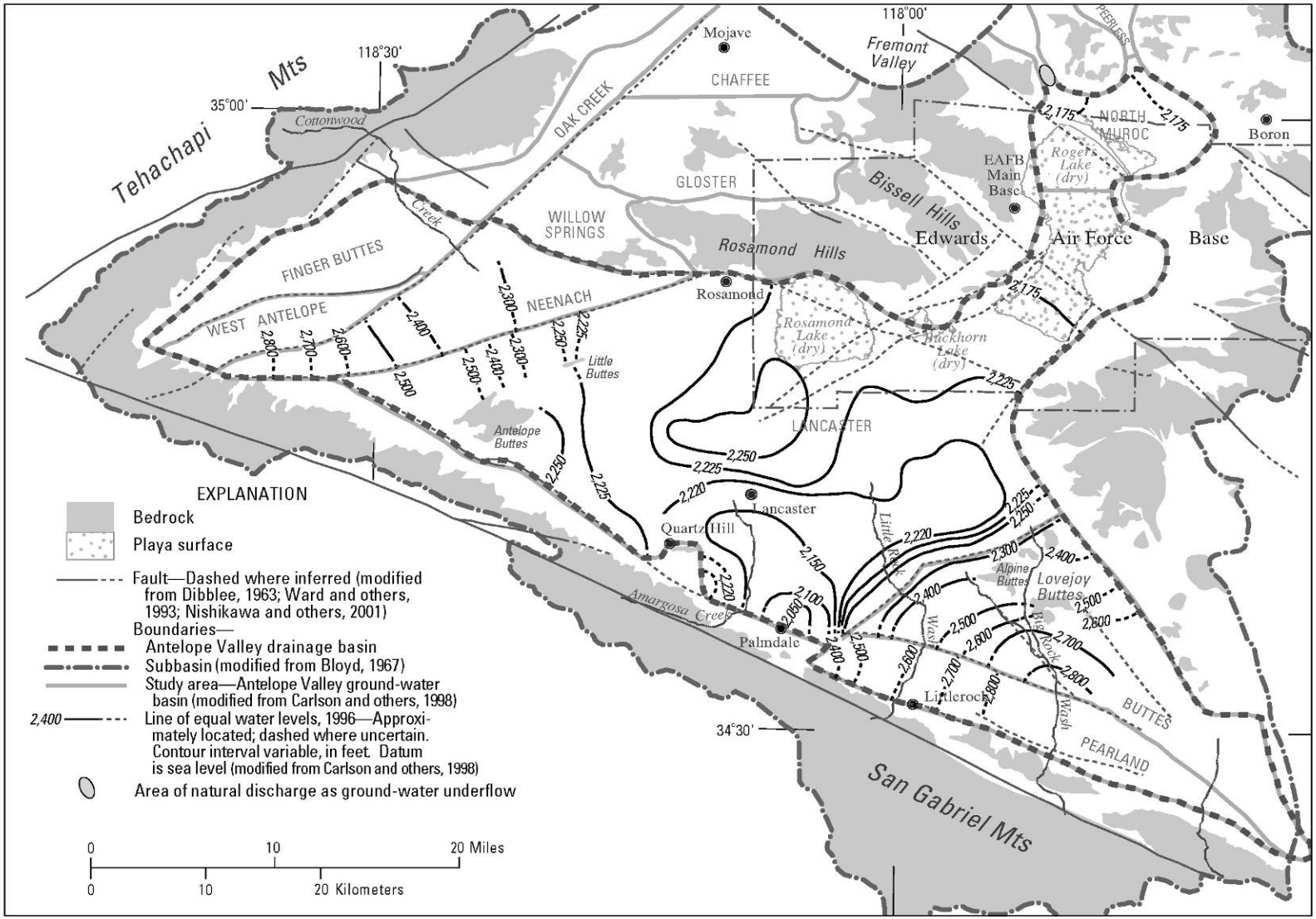

Figure 7. Ground-water levels in spring 1996 and location of area of natural discharge as ground-water underflow in the Antelope Valley ground-water basin, California.

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LAND SUBSIDENCE AND AQUIFER-SYSTEM COMPACTION

Land subsidence is the gradual settling or sudden sinking of the Earth's surface owing to subsurface movement of earth materials. One of the principal causes of land subsidence is the gradual compaction of susceptible aquifer systems that can accompany ground-water level declines caused by ground-water pumping (Galloway and others, 1999). Results of Global Positioning System and spirit leveling surveys indicate that as much as 6.6 ft of subsidence occurred in the valley between 1930 and 1992 (fig. 8) (Ikehara and Phillips, 1994). The spatial variability in the amount of land subsidence in Antelope Valley is affected by the magnitude of water-level declines and the distribution of compressible sediments. The large amount of subsidence measured around bench marks BM 474 and BM 1171A and between Little Buttes and Rosamond (fig. 8) is the result of water-level declines coupled with a significant thickness of compressible sediments in the aquifer system. No measurable land subsidence was detected near Palmdale, although it is an area of large water-level declines (Carlson and others, 1998). The lack of subsidence in this area indicates that compressible sediments may not exist or water levels may not have declined to the level at which inelastic (permanent) compaction of the sediments would occur. The results of a more recent study, which used satellite-based interferometric synthetic aperture radar (InSAR) to measure land subsidence during the period October 20, 1993, to December 22, 1995, indicated that locally, more than 0.16 ft of subsidence occurred and likely is still occurring in the valley (Galloway and others, 1998). Detrimental effects of land subsidence include the loss of aquifer storage, increased flooding, cracks and fissures at land surface, damage to man-made structures, and intangible economic costs.

Compaction of the aquifer system occurs when the hydraulic head or fluid pressure in compressible, fine-grained sediments declines, releasing porewater in the compressible sediments from storage (Fluid pressure has units of stress and is equal to hydraulic head times the specific weight of water). For a constant total stress on the aquifer system the associated decrease in fluid pressure is accompanied by an equivalent increase in the effective or intergranular stress on the granular matrix or skeleton of the aquifer system, resulting in aquifer-system compaction. The magnitude of the compaction is governed by the compressibility of the sediments which varies by an order of magnitude or more depending on whether the intergranular stress changes are in the elastic or inelastic range of stress for the compacting sediments. Elastic compaction is compaction that occurs when the skeletal structure of the sediments is not permanently rearranged: it can be reversed by an associated rise in hydraulic head. Inelastic compaction is compaction that occurs when there is a permanent rearrangement of the skeletal structure of the sedimentary matrix; it cannot be reversed by a rise in hydraulic head, and, therefore, results in a permanent lowering of land surface and a loss of ground-water storage capacity. The point to which hydraulic heads must decline to cause inelastic compaction in the compressible sediments is termed the preconsolidation head. When hydraulic head in the compressible sediments declines below the existing preconsolidation head, permanent compaction can occur and a new lower preconsolidation head is established. When heads fluctuate above the preconsolidation head, generally small magnitude elastic (reversible) compaction occurs. Detailed discussions of the mechanics of compaction and its relation to land subsidence are given in reports by Leake and Prudic (1991), Ikehara and Phillips (1994), Galloway and others (1998), and Galloway and others (1999).

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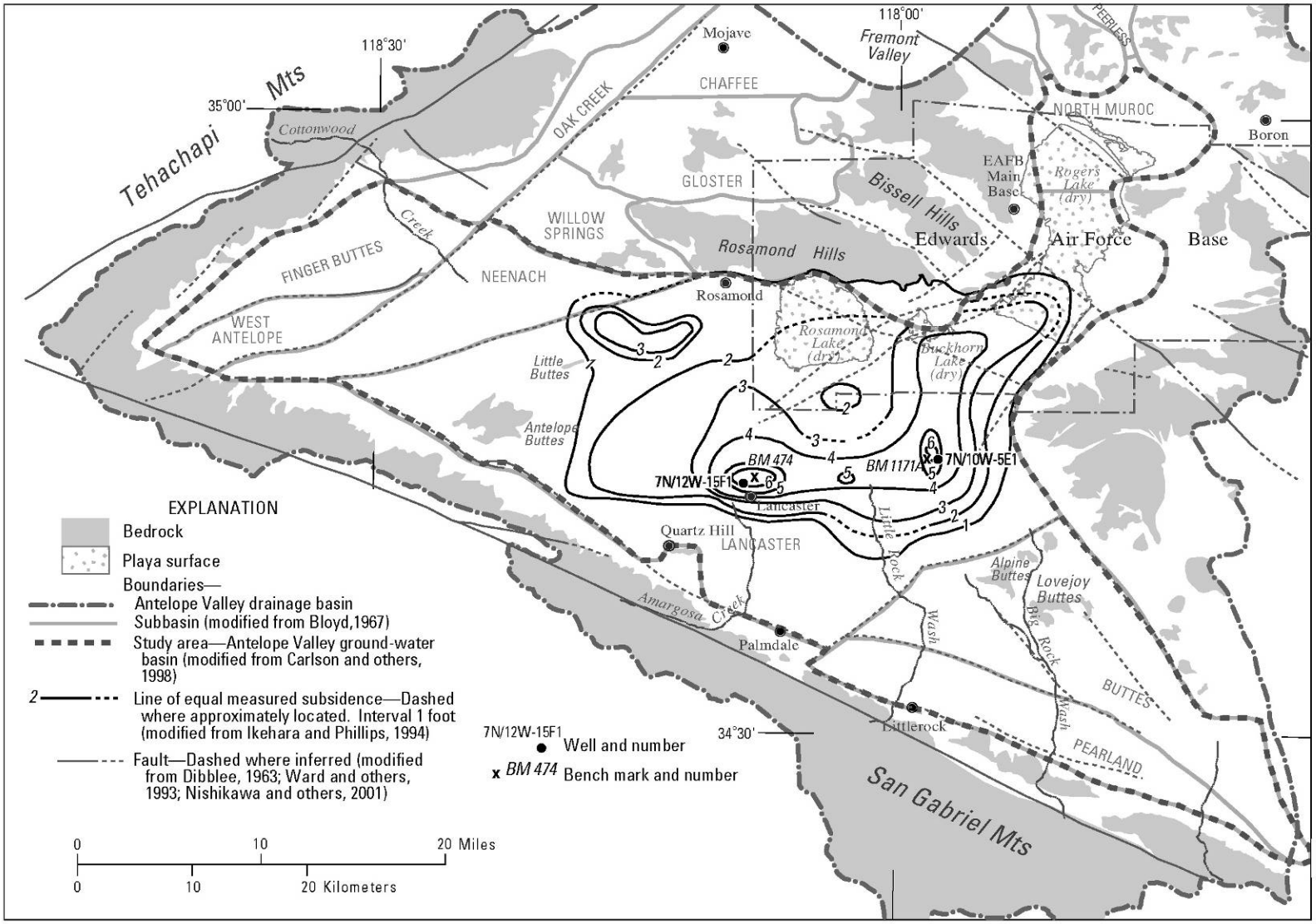

Figure 8. Measured subsidence in the Antelope Valley ground-water basin, California, 1930–92.

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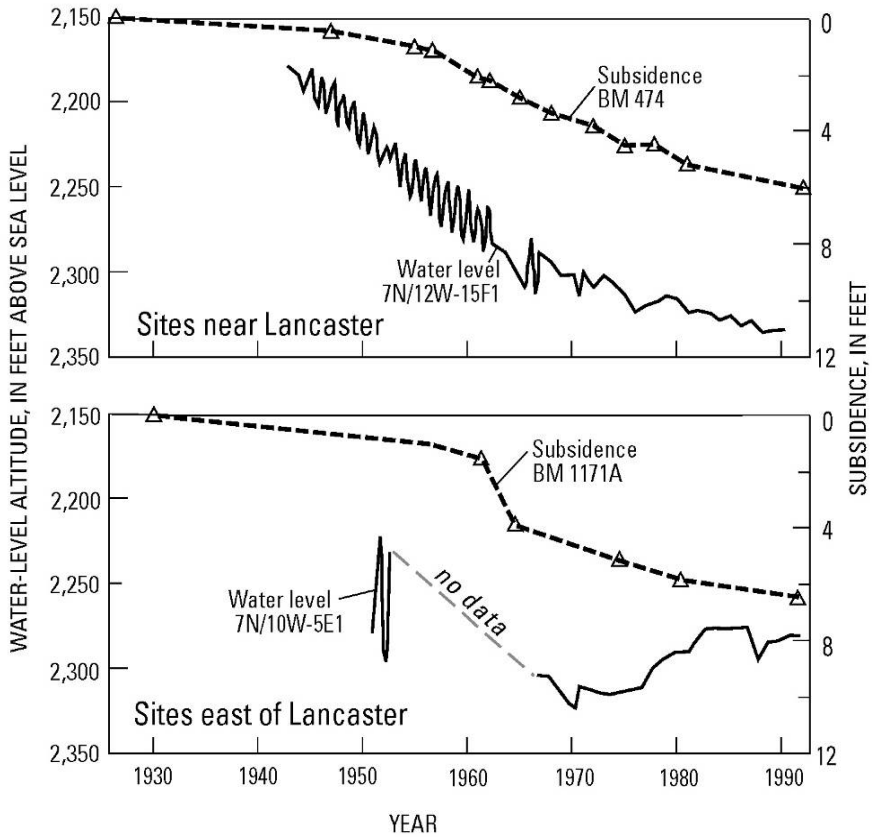

Figure 9. Paired water-level and land-subsidence data for sites near and east of Lancaster, Antelope Valley, California (modified from Ikehara and Phillips, 1994). Location of bench marks and wells are shown on figure 8.

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As noted earlier, the ground-water system in Antelope Valley is made up of alluvial and lacustrine sedimentary deposits. The alluvial deposits consist of sand and gravel interbedded with thin, fine-grained silt and clay layers. The lacustrine deposits consist of thick clay layers interbedded with thin coarse-grained material. Compaction can occur in both the thin and the thick fine-grained silt and clay layers that form confining beds, or aquitards; little compaction, however, can occur in the sand and gravel deposits. As described by Freeze and Cherry (1979), "... the term aquitard has been coined to describe the less-permeable beds in a stratigraphic sequence. These beds may be permeable enough to transmit water in quantities that are significant in the study of regional ground-water flow, but their permeability is not sufficient to allow the completion of production wells within them." The thickness of the aquitards affects the rate and the duration of aquifer-system compaction. The thickness of the aquitard affects the rate at which the fluid pressure of the aquitard equilibrates with the fluid pressure of the surrounding coarse-grained material; thin aquitards equilibrate faster than thick aquitards. Hydraulic heads in aquifer material surrounding the thick aquitards may recover to levels higher than preconsolidation head, but compaction can continue to occur until the hydraulic heads in the thick aquitards equilibrate with hydraulic heads in the surrounding coarse-grained deposits. This equilibration can take years to complete and is termed residual compaction. The fluid-pressure equilibration between thick or thin aquitards and the surrounding aquifer results in release from or uptake to storage in the aquitards and involves fluid-flow between the aquitards and aquifer. This flow is primarily vertical as the lateral extent of aquitards is generally much greater than their thickness.

The relation between hydraulic head, which is measured as water levels in wells, and compaction, which is typically measured as land subsidence at land surface, can be seen in figure 9. The measured land subsidence at BM 474 near Lancaster is directly related to the continuous water-level decline measured in

nearby well 7N/12W-15F1. The measured land subsidence at BM 1171A east of Lancaster is related to the water-level decline measured in nearby well 7N/10W-5E1 from about 1950–70, however the continued measured land subsidence from 1970s to the early 1990s does not correspond to the measured water-level recovery in the nearby well during this same time period. The subsidence that occurred at BM 1171A from the 1970s to the early 1990s may be the result of residual compaction.

SIMULATION OF GROUND-WATER FLOW

The objective of constructing a numerical ground-water flow model of the Antelope Valley ground-water basin was to gain a better understanding of the aquifer system and to develop a tool for evaluating and predicting aquifer responses to various water-management alternatives. Because land subsidence has been occurring in the Antelope Valley since the 1930s (Ikehara and Phillips, 1994; Galloway and others, 1998), a significant amount of the water being pumped in the valley may come from the compacting sediments. It is important, therefore, that a model of the valley have the capability to simulate compaction. Results of aquifer-system compaction simulations can be used to evaluate the potential for future compaction and land subsidence due to water-level declines in the valley.

The numerical model used for this study is the USGS modular three-dimensional finite-difference ground-water flow model (MODFLOW) (McDonald and Harbaugh, 1988). The basic MODFLOW code was used with the Interbed Storage 1 (IBS1) Package (Leake and Prudic, 1991) to simulate aquifer-system compaction and land subsidence and the Horizontal Flow Barrier (HFB) Package (Hsieh and Freckleton, 1993) to simulate the effect of horizontal barriers, such as faults, to ground-water flow. Ground-water levels were calculated at discrete points by solving simultaneous equations that approximate the partial differential equation for ground-water flow. The discrete points are the result of discretization of the model area into a series of layered rectangular model cells with the points (or nodes) located at the center of model cells. Land subsidence is computed at a model cell by summing the compaction simulated in each of the model layers, and is reported for the model cell in the uppermost layer.

The model can simulate ground-water levels and fluxes and aquifer-system compaction on the basis of the ability of the aquifer system to transmit water (transmissivity), its capacity to store and release water (storage coefficient), and the applied hydrologic stresses (recharge and discharge). The model, however, is only an approximation of the aquifer system being simulated and, therefore, cannot exactly duplicate or represent the actual system. Because model development requires the use of data, assumptions, and simplifications to approximate the system, the model is only as accurate as the assumptions and data used to develop the model.

Model Discretization and Boundaries

The model grid consists of 43 rows and 60 columns with a total of 2,580 square cells (fig. 10). Each cell represents 1 mi^2 with a distance of 5,280 ft (1 mi) on a side. The aquifer system was discretized vertically into three layers. Layer 1 represents the upper aquifer and is unconfined throughout most of the ground-water basin. Around the southern part of Rogers Lake and west to Rosamond Lake, where surface clays act as a confining unit for the aquifer, layer 1 was simulated as confined or unconfined, depending on the water level. Where layer 1 is unconfined, the upper boundary of the layer is the water table. Where layer 1 is confined, the upper boundary of the layer is the bottom of the confining clay, which is 61 to 285 ft below land surface. The lower boundary of layer 1 is at an altitude of 1,950 ft above sea level. Layer 2 is confined and represents the middle aquifer, which extends from 1,950 to 1,550 ft above sea level. Layer 3 is confined and represents the lower aquifer, which extends from 1,550 to 1,000 ft above sea level. Layers 1, 2, and 3 have 921, 626, and 536 active model cells, respectively. The lacustrine deposits in each aquifer are included in the layers representing the aquifers. Alluvial material at depths below 1,000 ft above sea level was assumed to be well-indurated, impermeable, and not a significant part of the regional flow system. Where the altitude of bedrock is above the defined layer bottom, the layer bottom is equal to the altitude of bedrock. The model grid and the lateral boundaries of the model layers are shown in figure 10.

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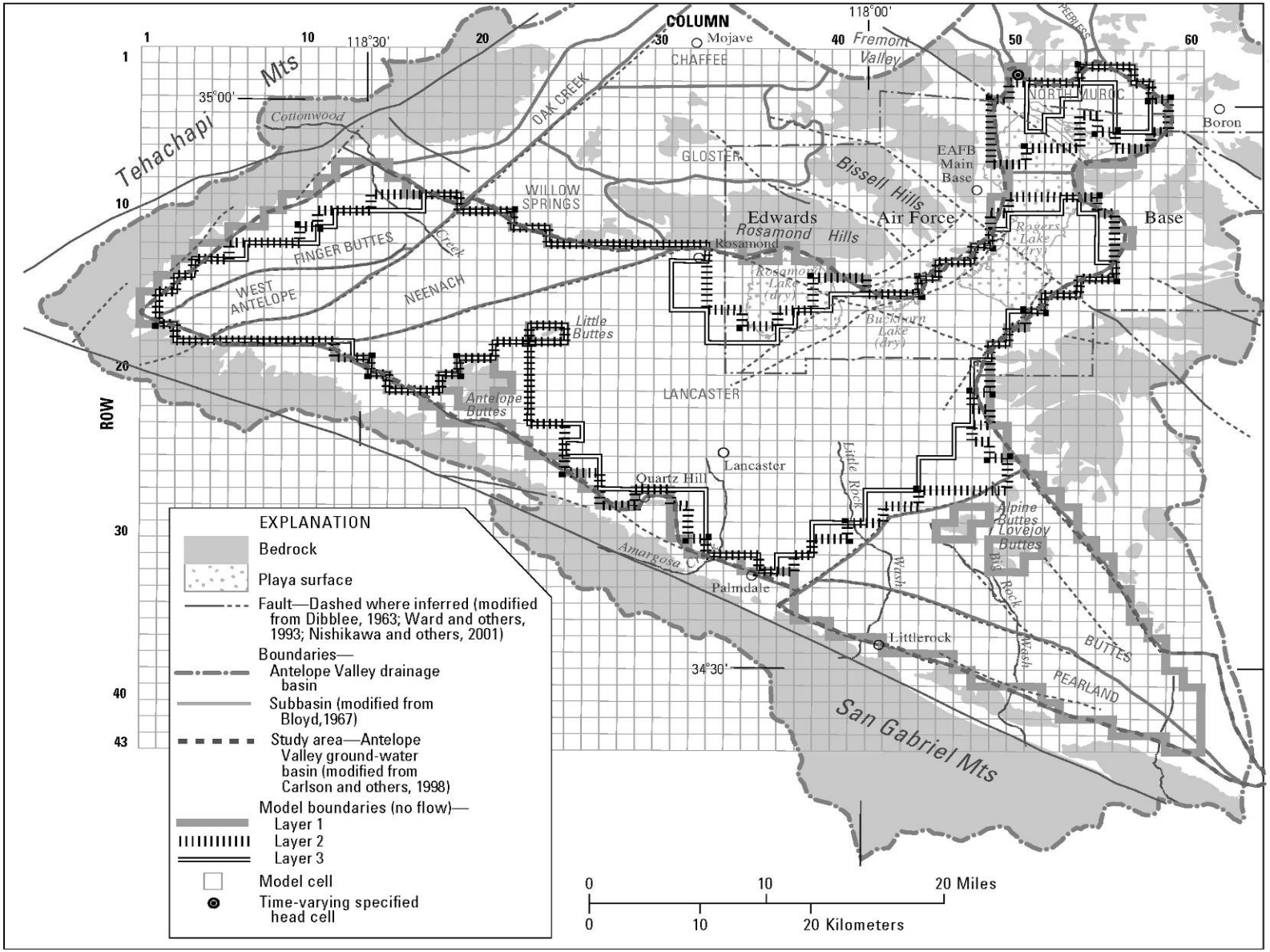

Figure 10. Model grid and boundaries of model layers in the ground-water flow model of the Antelope Valley ground-water basin, California.

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Temporally, the model was discretized into 81 stress periods, each 1 year in length, in which specified stresses were held constant. These 1-year periods were selected to correspond to the intervals when ground-water pumpage was reported and water levels in wells in the monitoring network were measured. Water levels and aquifer-system compaction in each active model cell were output from the model at the end of each stress period.

Except for the area around Rogers Lake where layer 1 may be confined by clay, the upper boundary of the model is the water table. It was simulated as a free-surface boundary that was allowed to move vertically in response to imbalances in the inflows and outflows to the model. The lateral boundaries of the model are all no-flow boundaries, except one boundary cell representing the area north of Rogers Lake where ground water discharges into the Fremont Valley. No water enters or leaves the system at the no-flow boundaries. These lateral boundaries are located at the contact between the aquifer and bedrock or barrier faults. To simulate discharge into Fremont Valley, the model cell for layer 1 for this location was designated as a time-varying specified-head boundary (fig. 10) where water can enter or leave the system as determined by the water-level gradient between this cell and adjacent active cells. The specified head in this cell was varied for each stress period on the basis of water-level data from nearby wells (Nishikawa and others, 2001). The lower boundary of the model also is a no-flow boundary. This no-flow boundary is located where the aquifer comes into contact with bedrock or at an altitude of1,000 ft above sea level, below which the deposits were assumed to be non-water-bearing.

Model Parameters

Simulation of ground-water flow and fluxes and aquifer-system compaction requires specifying aquifer-system properties and stresses. Aquifer-system properties can vary considerably both horizontally and vertically and thus cannot be precisely represented in a numerical model. The aquifer-system properties specified for each active cell in the model are estimates of the average conditions in the area represented by the cell. Similarly, stresses applied to the system (recharge and discharge) are estimates for the area represented by each cell. The initial aquifer-system properties, with the exception of the storage coefficients for confined aquifers specified for layers 1 and 2, were obtained from the Durbin (1978) model. Recharge and pumpage were estimated as described in earlier sections of this report. Selected properties and stresses were modified within reasonable limits during model calibration: the modifications were made on the basis of recently collected hydrologic data and parameters used in the ground-water flow models of the Edwards Air Force Base area (Sneed and Galloway, 2000; Nishikawa and others, 2001).

Hydraulic Conductivity and Transmissivity

Ground-water flow within the model layers was assumed to be horizontal. Hydraulic conductivity and transmissivity are properties that, in conjunction with the horizontal hydraulic gradient, control horizontal flow of ground water. Hydraulic conductivity is a measure of the water transmitting properties of aquifer material; coarse and (or) well-sorted material have a higher hydraulic conductivity than fine and (or) poorly sorted material. Transmissivity is the product of hydraulic conductivity and saturated thickness and represents the water-transmitting properties of the saturated section of the aquifer. Hydraulic conductivity was specified for layer 1 and transmissivity was specified for layers 2 and 3, because layer 1 is unconfined throughout most of the basin and layers 2 and 3 are confined. Hydraulic conductivity was specified for layer 1 to allow the model to compute changes in the transmissivity as the saturated thickness changes in the aquifer.

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Total aquifer-system transmissivity (the combined transmissivities represented by model layers 1–3, in feet squared per day) was estimated from specific-capacity data by multiplying the specific capacity (in gallons per minute per foot of drawdown) by a conversion factor of 230 (Thomasson and others, 1960). The specific-capacity data used to calculate transmissivity for this current study were from Bloyd (1967) and from more recent data from wells owned by the Los Angeles County Department of Public Works (James Hong, Los Angeles County Department of Public Works, Waterworks and Sewer Maintenance Division, written commun., 1997). The current estimates of transmissivity were consistent with those used in the Durbin (1978) model, which were obtained using data from Bloyd (1967). Transmissivities estimated from specific-capacity data probably are only approximations of the total transmissivity of the aquifer system because the wells from which the specific-capacity data were obtained were not perforated over the entire thickness of the aquifer system.

The initial transmissivity of layer 2 was calculated as the product of the saturated thickness (400 ft, except where bedrock is higher than 1,550 ft above sea level) and a hydraulic conductivity of 10 ft/d. The initial transmissivity of layer 3 was calculated as the product of the saturated thickness (550 ft, except where bedrock is higher than 1,000 ft above sea level) and a hydraulic conductivity of 2 ft/d. The hydraulic-conductivity values used for layers 2 and 3 were based on values from the Edwards Air Force Base model (Nishikawa and others, 2001) and on the preliminary results of modeling of the southern part of the Lancaster subbasin (Phillips and others, in press). The initial transmissivity of layer 1 was calculated by subtracting the sum of the initial transmissivities for layers 2 and 3 from the total transmissivity calculated from the specific-capacity data. The initial hydraulic conductivity for layer 1 was then calculated by dividing the initial layer 1 transmissivity by the pre-development saturated thickness of layer 1, which was estimated using water-level estimates from Durbin (1978) (fig. 4). To avoid unreasonably low values of hydraulic conductivity in layer 1, a minimum hydraulic-conductivity value of 2 ft/d was specified for the cells in that layer. The transmissivity of layers 2 and 3 remained constant throughout the entire simulation period because the water table never declined below the top of layer 2. Initial hydraulic-conductivity and transmissivity values for the area around Rogers Lake were modified to generally agree with the values used in a three-dimensional model developed by for the Edwards Air Force Base area (Nishikawa and others, 2001).

Vertical Leakance

Ground-water flow between model layers was assumed to be vertical and to occur when there is a difference in hydraulic head between layers. The vertical conductance between layers, which represents the ability of the aquifer to transmit water vertically, is calculated by the model using a specified vertical leakance value and the cell dimensions. The vertical leakance between model cells, which is a function of cell thickness and vertical hydraulic conductivity, was calculated outside the model using the following equation from McDonald and Harbaugh (1988):

$$\lambda_{k+1/2} = \frac{1}{\frac{\Delta z_k/2}{Kz_k} + \frac{\Delta z_{k+1}/2}{Kz_{k+1}}}, \qquad (2)$$

where

$\lambda_{k+1/2}$	is the vertical leakance between layers k and k+1 [t^{-1}],
Δz_k	is the thickness of layer k [L],
Δz_{k+1}	is the thickness of layer k+1 [L],
Kz_k	is the vertical hydraulic conductivity of layer k [Lt^{-1}], and
Kz_{k+1}	is the vertical hydraulic conductivity of layer k+1 [Lt^{-1}].

Equation 2 strongly weights the smaller of the two vertical hydraulic conductivity values. For example, if one layer contains thick lacustrine deposits of silt and clay and the other layer contains mostly alluvial deposits of sand and gravel, the vertical leakance between the layers is dependant mostly on the vertical hydraulic conductivity of the lacustrine deposits. The vertical hydraulic conductivities of layers 1, 2, and 3 were assumed to be one-hundreth of the horizontal hydraulic conductivities in areas where the lacustrine deposits are not present between the centers of adjacent layers. Where lacustrine deposits are

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present in a layer, the vertical hydraulic conductivity of the lacustrine deposits was used for that layer. An estimate of 1.0×10^{-2} ft/d was used for the vertical hydraulic conductivity of the lacustrine deposits, which is consistent with the value used by Durbin (1978) and three orders of magnitude higher than the value used by Nishikawa and others (2001).

Storage Coefficient

The storage (specific yield or storage coefficient) of water-bearing material is the quantity of water released from storage per unit area per unit decline in hydraulic head. The water released from storage is derived from the compression of the granular matrix (skeleton) of the aquifer system and the expansion of fluid. In confined and unconfined aquifer systems the release of water from storage in low-permeability, unconsolidated fine-grained sediments is accompanied by some degree of compression of the fine-grained sediments. The relation between changes in head, expressed as an equivalent change in pore-fluid pressure, and compression of the aquifer system is based on the principle of effective stress first proposed by Terzaghi (1925) for one-dimensional vertical consolidation of saturated sediment,

$$\sigma_e = \sigma_T - p, \tag{3}$$

where effective or intergranular stress (σ_e) is the difference between the total stress (σ_T) and the pore-fluid pressure (p). Under this principle, when the total stress remains constant, a change in pore-fluid pressure causes an equivalent change in effective stress within the aquifer system, which causes the aquifer system to expand or compress under the new load. In aquifer systems, conditions that cause changes in the total stress include the erosion or aggradation of sediment at land surface, or more commonly a change in the position of the water table overlying confined aquifers. For purposes of this discussion, the total stress is assumed constant.

When the effective stress is decreased by an increase in pore-fluid pressure, the aquifer system expands elastically. When the effective stress is increased by a reduction in pore-fluid pressure and the effective stress does not exceed the maximum past effective stress, the aquifer system compresses elastically. When a reduction in pore-fluid pressure causes an increase in effective stress that exceeds the previous maximum effective stress, the pore structure of the fine-grained sediments (aquitards) in the aquifer system undergoes significant rearrangement, resulting in permanent (inelastic) rearrangement of the granular structure, a reduction in pore volume and permanent compaction of the aquitards.

The elastic and inelastic skeletal compressibilities, α'_k, of the aquitards are expressed in terms of the skeletal specific storages, S''_{sk},

$$S''_{sk} = S''_{ske} = \alpha'_{ke}pg,\ \sigma_e \le \sigma_e(\max), \tag{4}$$
$$S''_{sk} = S''_{skv} = \alpha'_{kv}pg,\ \sigma_e > \sigma_e(\max),$$

where the primes denote aquitard properties, the subscript k refers to the skeletal component of specific storage, or compressibility, subscripts e and v refer to the elastic and virgin (inelastic) properties, p, is fluid density, and g is gravitational acceleration. For a change in effective stress, the aquitard deforms elastically when the effective stress is less than the previous maximum effective stress, $\sigma_e(\max)$; when the effective stress is greater than $\sigma_e(\max)$, the aquitard deforms inelastically. The previous maximum stress is termed the preconsolidation stress or, expressed as an equivalent hydraulic head is termed the preconsolidation head.

In typical aquifer systems composed of unconsolidated to semi-consolidated Cenozoic sediments, S''_{skv} is generally 30 to several hundred times larger than S''_{ske} (Ireland and others, 1984). The product of the elastic or inelastic skeletal specific storage and the aggregate thickness of the aquitards, $\sum b'$, is the aquitard skeletal storage coefficient S''_k:

$$S''_k = S''_{ke} = S''_{ske}\,(\sum b'),\quad \sigma_e \le \sigma_e(\max), \tag{5}$$
$$S''_k = S''_{kv} = S''_{skv}\,(\sum b'),\quad \sigma_e > \sigma_e(\max),$$

for the elastic (S''_{ke}) and inelastic (S''_{kv}) range of skeletal compressibility, respectively. A similar set of equations, one for the coarse-grained aquifers and one for pore water, relates the compressibility of the aquifer skeleton (α_k) to the aquifer skeletal storage coefficient (S_k) and the compressibility of water (β_w) to the component of aquifer-system storage attributed to the pore water (S_w):

$$S_k = S_{sk}\,(\sum b) = \alpha_k pg(\sum b), \tag{6}$$

$$S_w = \beta_w pg[n(\sum b) + n'\,(\sum b')], \tag{7}$$

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where $\sum b$ is the aggregate thickness of the aquifers and n and n' are the porosities of the aquifers and aquitards, respectively. For coarse-grained aquifers interbedded with compressible aquitards, the difference between the elastic and inelastic compressibilities of the aquifer skeleton is considered relatively insignificant, and $\alpha_k \cong \alpha_{ke}$.

The aquifer-system storage coefficient S is defined as the sum of the skeletal storage coefficients of the aquitards and aquifers (equations 5–6) plus the storage attributed to water compressibility (equation 7). Thus,

$$S = S'_k + S_k + S_w. \tag{8}$$

For compacting aquifer systems, $S'_{skv} >> S_{sw}$ (specific storage of water), and the inelastic storage coefficient of the aquifer system is approximately equal to the inelastic aquitard skeletal storage coefficient, $S_v \cong S'_{kv}$. In confined aquifer systems subject to large-scale overdraft, the volume of water derived from permanent aquitard compaction can typically range from 10 to 30 percent of the total volume of water pumped and represents a one-time mining of stored ground water and a small permanent reduction in the storage capacity of the aquifer system.

In unconfined aquifer systems the skeletal storage coefficients described above also govern the compressibility of the fine-grained sediments below the water table and contribute to the volume of water released from storage when heads decline, and is defined by the specific yield, Sy, of the aquifer system. Water derived from storage in unconfined aquifer systems primarily results from the gravity drainage of pore water from the sediments and its value is typically in the range of 0.1–0.3, somewhat less than the porosity, and somewhat greater than the specific retention of the sediments. Typically, $S_y >> S$ by two to three orders of magnitude.

For confined and unconfined aquifers, the IBS1 Package requires that storage coefficient terms be specified for the elastic skeletal storage coefficient (S_{ke}), and inelastic aquitard skeletal storage coeffficient (S'_{kv}) (Leake and Prudic, 1991). For confined aquifers, in order to account for the component of storage related to the compressibility of water, S_w was entered as the storage coefficient in the BCF package of MODFLOW. Within MODFLOW these three storage components (S_{ke},S'_{kv}, and S_w) are summed and the storage coefficient of the aquifer system, S, is implemented for each model layer. For unconfined aquifers, IBS1 requires the two components of the skeletal storage coefficient. In contrast with the procedure used to implement the aquifer-system storage coefficient for confined aquifers, the specific yield (S_y) was entered as the storage term in the input file for the BCF package for layer 1, and this value was used by the model where and when unconfined aquifer conditions occurred in that model layer. Note that the specific yield of an unconfined aquifer is many orders of magnitude greater than storage coefficient associated with the compressibility of water. Therefore, the water released from storage owing to the expansion of water is negligible with respect to the amount released by the gravity drainage of pore water. In this model, it was assumed that compaction occurs only in layers 1 and 2. Because little pumping occurs in layer 3 and because sediments in layer 3 have been subjected to fairly large overburden stress, it was assumed that there is little potential for compaction of this layer.

The initial storage coefficients for the model were calculated using specific-storage values obtained from one-dimensional (Sneed and Galloway, 2000) and three-dimensional (Nishikawa and others, 2001) models of ground-water flow and aquifer-system compaction at Edwards Air Force Base. The specific storage values range from 4.2×10^{-7} ft^{-1} for the compressibility of water (S_{sw})to 3.5×10^{-4} ft^{-1} for the inelastic skeletal specific storage (S'_{skv}) of thick (greater than 18 ft) aquitards (table 4). The initial storage coefficients for the compressibility of water (S_w) and elastic skeletal storage (S_k) for layers 1 and 2 were calculated as the product of the respective specific-storage value and the saturated thickness of the layer. The initial inelastic aquitard skeletal storage coefficients (S'_{kv}) were calculated as the product of the inelastic specific storage of thick aquitards and the estimated total thickness of aquitards within the aquifer.

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Table 4. Specific storage values used in calculating storage coefficients for layers 1 and 2 in the ground-water flow model of the Antelope Valley ground-water basin, California

[Data from Sneed and Calloway, 2000; Nishikawa and others, 2001. ft^{-1}, per foot]

	Specific storage (ft^{-1})
Compressibility of water.....	4.2×10^{-7}
Elastic skeletal specific storage..	1.7×10^{-6}
Inelastic skeletal specific storage for thin aquitards (less than or equal to 18 feet thick)	4.0×10^{-5}
Inelastic skeletal specific storage for thick aquitards (greater than 18 feet thick)	3.5×10^{-4}

The total thickness of the aquitards in layers 1 and 2 was estimated from the percentage of the fine-grained sediments in these layers that was determined from descriptions of the aquifer material noted in selected well drillers' logs. The percentage of fine-grained sediments ranged from 13 to 50 percent of the thickness of each layer. The inelastic aquitard skeletal storage coefficient was specified only for those areas of layers 1 and 2 where subsidence of more than 1 ft had been measured in the study area (fig. 8). Compaction was not simulated for layer 3; therefore, the storage coefficient for layer 3 was estimated by multiplying the specific storage of the aquifer by the thickness of the layer (550 ft). A specific storage of 2.0×10^{-6} ft^{-1} was assumed representative of the aquifer materials in layer 3, resulting in a storage coefficient of 1.0×10^{-3}. This value was used throughout layer 3, regardless of the thickness of the layer, except for the model area near Rogers Lake, north of the Willow Springs Fault. The storage coefficient calibrated by Nishikawa and others (2001) during the simulation of ground-water flow and land subsidence at Edwards Air Force Base (5.71×10^{-4}) was used in the model area north of Willow Springs Fault.

Specific-yield values used in the Durbin (1978) model for the unconfined aquifer ranged from 0.05 to 0.20: these values were used as initial values for the upper aquifer. Microgravity measurements collected from 1996–98 as part of an injection, storage, and recovery test at Lancaster were used to estimate a specific yield of about 0.13 (Howle and others, 2003).

Preconsolidation Head

As noted earlier, inelastic compaction of compressible sediments occurs when water levels decline below the preconsolidation head. Accurate estimates of preconsolidation head values are critical for the simulation of subsidence (Sneed and Galloway, 2000); the initial values of preconsolidation head for the model were based on results from the one-dimensional model of ground-water flow at Edwards Air Force Base (Sneed and Galloway, 2000). Initial preconsolidation head values were specified from 0 to 50 ft below pre-development water levels only for those areas that have 1 ft of measurable subsidence (fig. 8). If future water levels decline below preconsolidation heads outside the areas of subsidence shown in figure 8, then subsidence may occur in those areas. The magnitude and distribution of preconsolidation heads for the areas that have no measurable subsidence are not known and, therefore, calibration of preconsolidation heads for these areas is not possible. Subsidence was not simulated for those areas because there is no constraint for the range of preconsolidation heads.

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Horizontal-Flow Barriers

Nine faults that transect the ground-water basin were simulated as partial barriers to ground-water flow (fig.11, table 5). The Horizontal-Flow Barrier (HFB) package (Hsieh and Freckleton, 1993) was used to simulate these faults as horizontal-flow barriers. The HFB package allows for the simulation of thin, vertical, low-permeability geologic features, such as vertical faults and fine-grained material, that act as partial barriers to horizontal ground-water flow. The function of each simulated barrier is to lower the horizontal conductances between two adjacent model cells. The barriers are defined by a hydraulic characteristic, which for unconfined aquifers is the hydraulic conductivity of the fault divided by the width of the fault and for confined aquifers is the transmissivity of the fault divided by the width of the fault. Each barrier may be subdivided into segments and each segment may have a different hydraulic characteristic. All the barriers simulated in the model were assumed to extend through all three model layers. The hydraulic characteristic value for each segment (table 5) was determined by model calibration.

The simulated barriers include an unnamed fault between Finger Buttes and West Antelope subbasins (barrier 1), the Randsburg–Mojave Fault (barrier 2), the Neenach Fault (barrier 3), and an unnamed fault between the Buttes and Pearland subbasins (barrier 4) (fig. 11, table 5). These four barriers were simulated as partial barriers to ground-water flow in the Durbin (1978) model. The fault separating the Buttes and Pearland subbasins from the Lancaster subbasin (fig. 11) was not simulated as a barrier to flow in the Durbin (1978) model. This fault also was not simulated as a barrier to flow in this model. Five of the faults simulated as partial barriers to flow were not simulated as barriers in the Durbin (1978) model. These faults include the extensions of the Muroc Fault (barrier 5) and the El Mirage Fault (barrier 6) across Rogers Lake and an extension of the Willow Springs fault from the northwest corner of Rosamond Lake southeast along the southern edge of Buckhorn Lake to the eastern edge of the study area (barrier 7). These faults were simulated as partial barriers to flow in the Edwards Air Force Base model (Nishikawa and others, 2001). Two additional partial barriers to flow were inferred from water-level data and model calibration; one barrier southeast of Lovejoy Buttes, parallel to the northeast boundary of the Buttes subbasin (barrier 8), and one barrier south of Rosamond Lake, trending northwest-southeast from the Neenach Fault to the eastern edge of the study area (barrier 9). These barriers are believed to be related to faults that are not exposed at land surface.

Model Stresses

Hydraulic heads in the ground-water flow system respond to stresses on the system, which correspond to recharge and discharge. As noted earlier, recharge to the ground-water system includes natural recharge from mountain-front runoff and stream infiltration in the upper reaches of ephemeral streams and artificial recharge of irrigation-return flow and treated wastewater. Discharge from the ground-water systems includes evapotranspiration, ground-water outflow, and ground-water pumpage.

Natural Recharge

Natural recharge from mountain-front runoff and stream infiltration was simulated as areal recharge to layer 1, the location of the recharge cells are shown in figure 12. The initial value of total annual natural recharge was assumed to be 40,700 acre-ft, the value simulated in the Durbin (1978) model. The distribution of natural recharge was based on the location and size of the intermittent streams used to estimate natural recharge (Durbin, 1978). The initial annual recharge specified for these cells ranged from 65 to 3,800 acre-ft for each cell. Natural recharge did not vary from year to year because data were limited, which precluded simulating seasonal or annual variations in natural recharge. Results from a study by Bouwer (1982) indicate that seasonal and annual fluctuations in infiltration are attenuated as a function of sediment particle size in the unsaturated zone and vertical distance to the water table. Natural recharge was not specified for the entire reach of streams in the basin because the streams are intermittent and flow does not always occur over the entire length of the stream.

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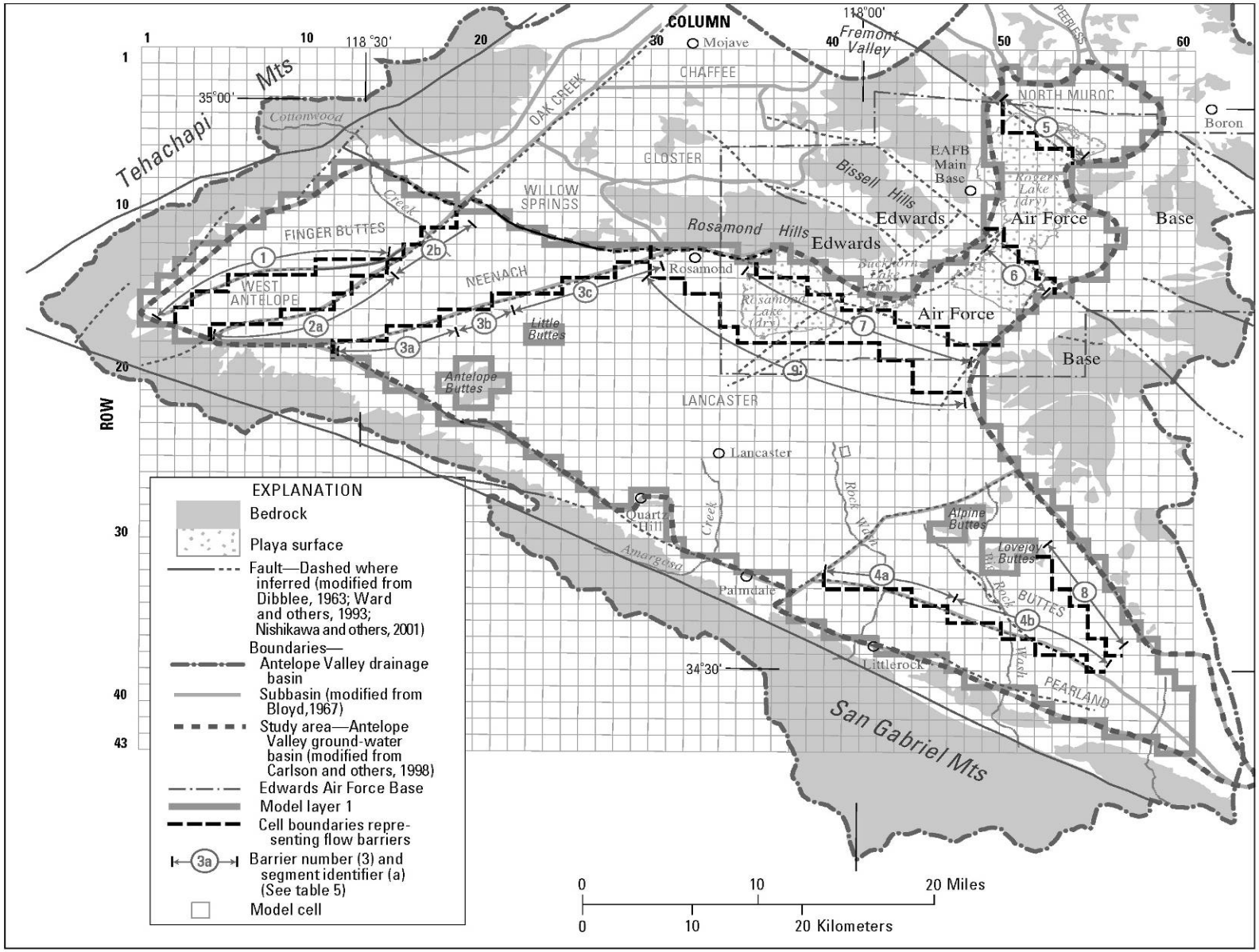

Figure 11. Location of barriers to horizontal ground-water flow simulated in the ground-water flow model of the Antelope Valley ground-water basin, California.

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Table 5. Hydraulic characteristics of the horizontal-flow barriers simulated in the ground-water flow model of the Antelope Valley ground-water basin, California

[d^{-1}, per day; ft/d, foot per day. —, no barrier simulated in this layer]

Barrier No.	Segment	Barrier name	Hydraulic characteristic		
			Layer 1 (d^{-1})	Layer 2 (ft/d)	Layer 3 (ft/d)
1		([1])	0.00008	0.0008	0.0008
2	a	Randsburgq–Mojave Fault	.00007	.0007	.0007
	b		.00002	.0002	.0002
3	a	Neenach Fault	.0008	.008	.008
	b		.002	.02	.02
	c		.004	.04	.04
4	a	([1])	.0004	—	—
	b		.0003	—	—
5		Muroc Fault	.001	.01	.01
6		El Mirage Fault	.001	.01	.01
7		Willow Springs Fault	.0001	.001	.001
8		([1])	.00001	—	—
9		([1])	.00001	.0001	—

[1] Unnamed

Artificial Recharge

Artificial recharge in the ground-water basin, as noted earlier, includes the infiltration of irrigation-return flows of pumped ground water and imported water used for agriculture and treated wastewater discharged to spreading ponds.

Irrigation-Return Flow

Irrigation-return flow is that portion of the water applied to crops that is not consumptively used by the crops. Irrigation efficiency, which is defined as the percentage of applied water used by the crops, was assumed to be 70 percent, leaving as much as 30 percent of the applied irrigation water available to return to the water table as irrigation-return flow. In Antelope Valley, most of the applied water is for the production of alfalfa. The irrigation efficiency was estimated on the basis of the quantity of irrigation water applied to alfalfa [approximately 6.6 ft/yr (Orloff and others, 1989)] and the quantity of water consumed by alfalfa [approximately 4.8 ft/yr (table 2)]. Estimates of irrigation efficiency by Snyder (1955) and by the California Department of Public Works (1955) were about 50 percent; however, consumptive-use estimates at the time of these two studies (3.4–3.6 ft/yr) were lower than current estimates (4.8 ft/yr). The current consumptive-use estimates were considered more accurate than the consumptive-use estimates used by researchers in the 1950s; therefore, an irrigation efficiency of 70 percent was assumed valid for the entire simulation period.

Because pumpage has caused ground-water levels to decline more than 100 ft throughout most of the ground-water basin and owing to the existence of thin aquitards within the aquifers, recharge from water applied for agriculture probably did not reach (recharge) the water table until about 10 years after application. The actual delay in irrigation-return flow reaching the water table probably is variable depending on the depth to water and the existence of fine-grained layers in the unsaturated zone. Irrigation-return flows were simulated as wells that had positive flow rates (i.e., flow recharging the ground-water flow system) at the cells where agricultural pumpage was simulated (fig. 5). The areas that had irrigation-return flows remained constant during 1915–51 but varied annually during 1952–95. Annual agricultural recharge varied from 0 to 111,000 acre-ft.

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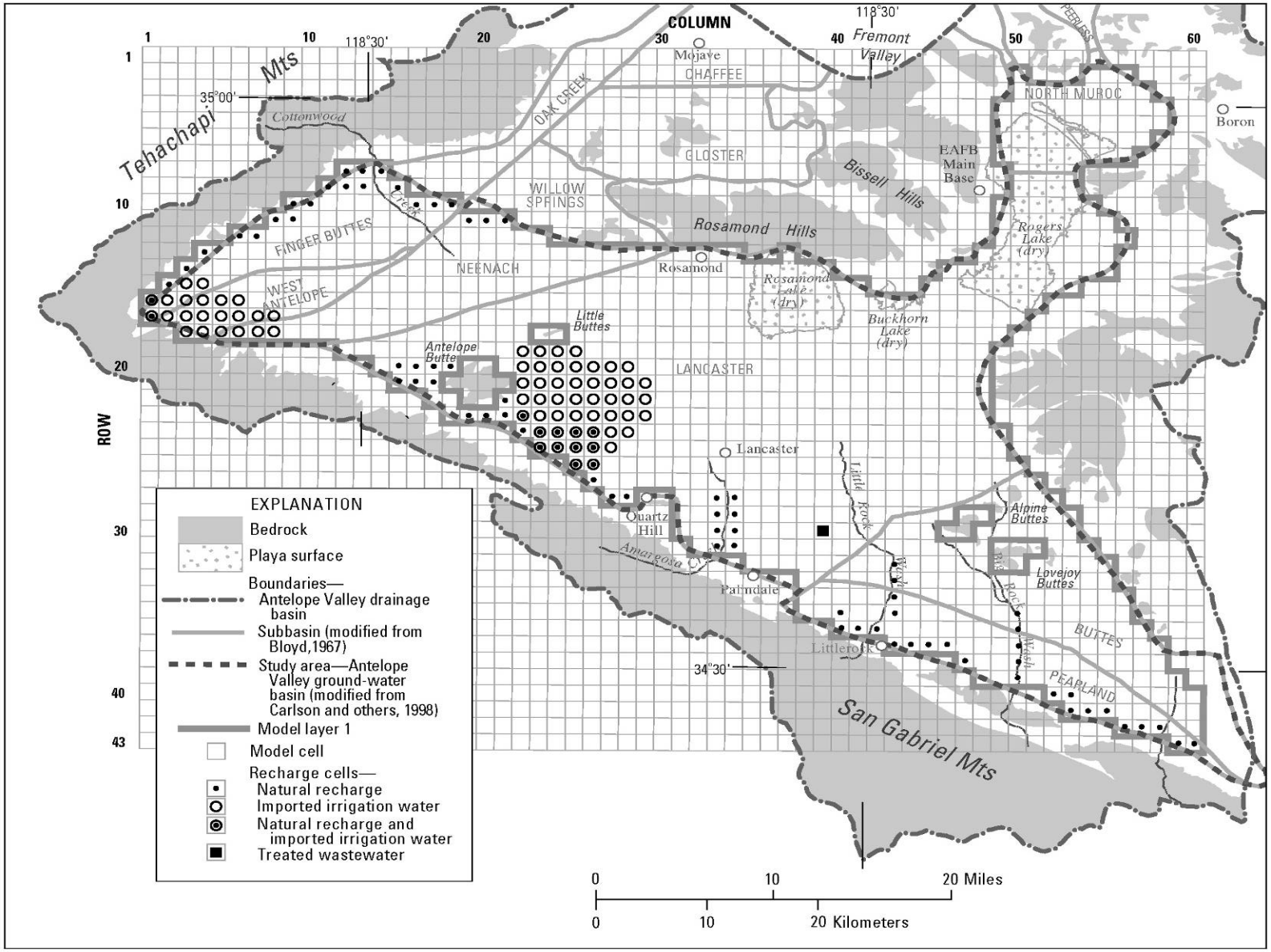

Figure 12. Location of model cells used to simulate natural recharge, recharge of imported water used for irrigation, and recharge of treated wastewater in the ground-water flow model of the Antelope Valley ground-water basin, California.

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Beginning in 1972, water was imported from northern California to Antelope Valley by way of the California aqueduct. Records of deliveries of imported water from the Antelope Valley–East Kern Water Agency (AVEK) show that growers began using large quantities of imported surface water in 1976. The records also indicate that most of the imported water was delivered to two areas of the valley; (1) the western part of the Lancaster subbasin, east of Antelope Buttes, and (2) the far western part of the study area, in the Finger Buttes, Neenach, and West Antelope subbasins (fig. 12). Thirty percent of the annual imported water delivered to these areas was specified as irrigation-return flow and was simulated as wells that had positive flow rates into layer 1 of the model 10 years after the water was applied at land surface.

Treated Wastewater

The estimated annual quantity of treated wastewater that could infiltrate into the unsaturated zone is shown in table 1. The treated wastewater is from urbanized parts of the study area that are served by the water reclamation plants. Recharge from septic systems in the rural parts of the study area was assumed to be negligible. Recharge from treated wastewater was assumed to reach the water table in the year that it was applied at land surface because this source of water is essentially constant and the rate of infiltration per acre is much greater than that for agriculture. Recharge from the Palmdale Water Reclamation Plant was applied to only one cell (fig. 12) for 1984–95, the years in which recharge from the treated wastewater was estimated to occur (table 1). On the basis of results of infiltration studies at the Lancaster Water Reclamation Plant, the assumption was made that recharge of treated wastewater from the plant does not reach the regional water table, and, therefore, it was not simulated for this site.

Natural Discharge

Evaporation from bare-soil and transpiration by phreatophytes in areas were the water table was near land surface were simulated using the Evapotranspiration Package developed by McDonald and Harbaugh (1988). These areas were identified using maps that show the area of flowing wells in 1908 (Johnson, 1911) and alkali soils (Durbin, 1978) (fig. 13). Estimates of evapotranspiration rates in Antelope Valley were based on results reported by Lines and Bilhorn (1996) in the nearby Mojave River Basin. An annual maximum evapotranspiration rate of 0.6 ft/yr was specified when the water table was at land surface and was decreased linearly to zero when the water table reached a depth of 10 ft below land surface.

Durbin (1978) estimated that 1,000 acre-ft/yr of ground water is discharged as ground-water underflow north of Rogers Lake into Fremont Valley: this estimate was based on the water-level gradient and the cross-sectional area of the aquifer. Water-level data from nearby wells indicate that the gradient at that location has not been constant over time, which suggests that subsurface ground-water flow has not been constant (Nishikawa and others, 2001). Variable subsurface ground-water flow was specified in the transient-state simulation using a time-varying specified-head cell (fig. 13). The water level at the specified-head cell (fig. 14) was based on water-level data from nearby wells (Nishikawa and others, 2001), and flow out of the study area into Fremont Valley was calculated by the model using the gradient between the specified-head cell and adjacent active cells.

Pumpage

Total annual pumpage specified in the model is shown in figure 5. The spatial distribution of pumpage for 1915–51 was based on the Durbin (1978) model. The spatial distribution of pumpage for 1915–51 was concentrated primarily in agricultural areas and did not vary over time. The spatial distribution of pumpage for 1952–95 was based on the spatial distribution of pumpage in the database created by Templin and others (1995) and updated for this study (see Appendix: Water Use 1992–95). The pumpage database contains annual pumpage data for individual wells and information on the location of these wells. Well location data allowed the spatial distribution of pumpage in the model to vary for 1952–95, years when the primary pumping centers moved from agricultural areas to urban areas. The pumpage database, however, does not contain data for all agricultural pumpage in the study area; therefore, land-use data were used in conjunction with the database to simulate the distribution of agricultural pumpage.

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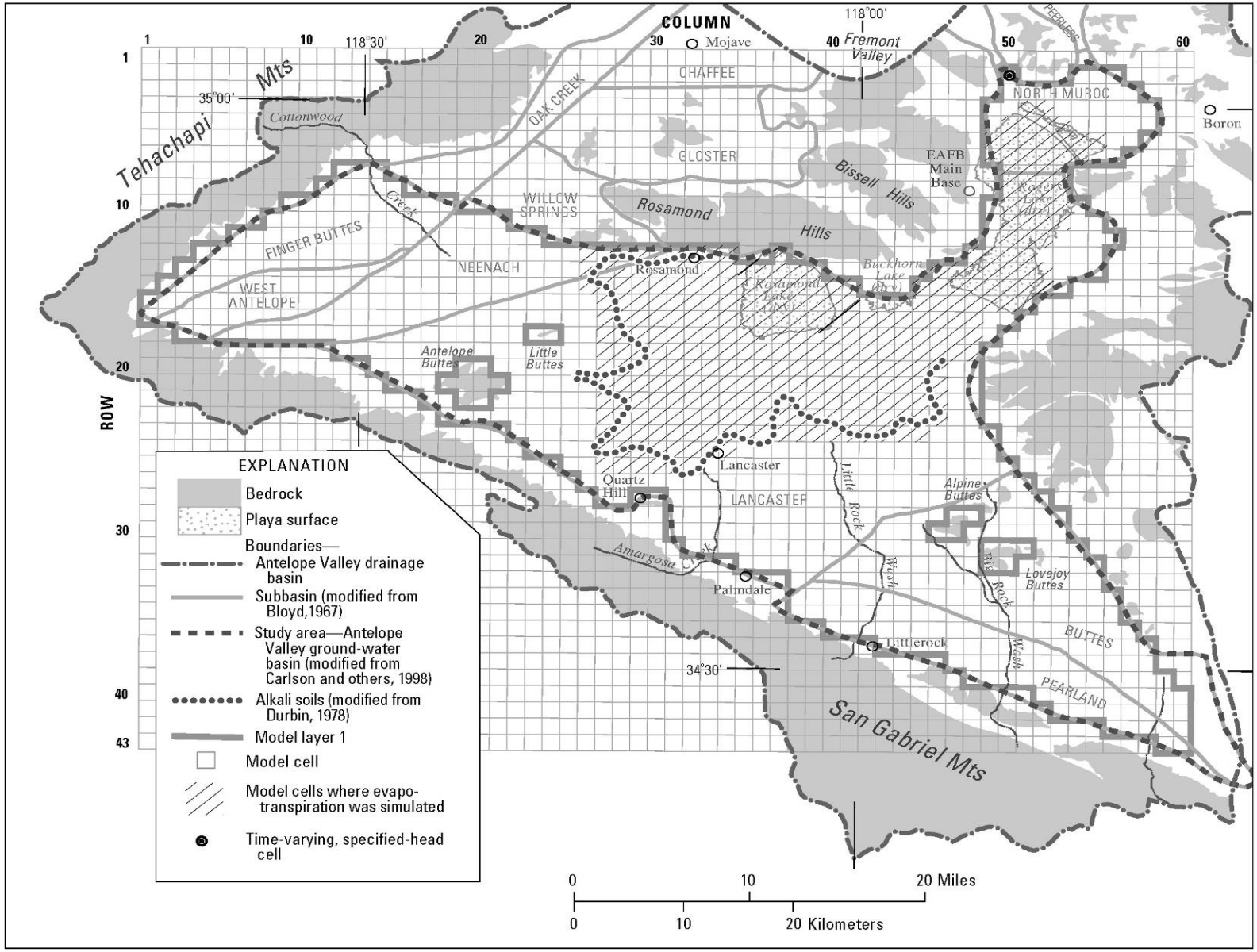

Figure 13. Location of model cells used to simulate natural ground-water discharge in the ground-water flow model of the Antelope Valley ground-water basin, California.

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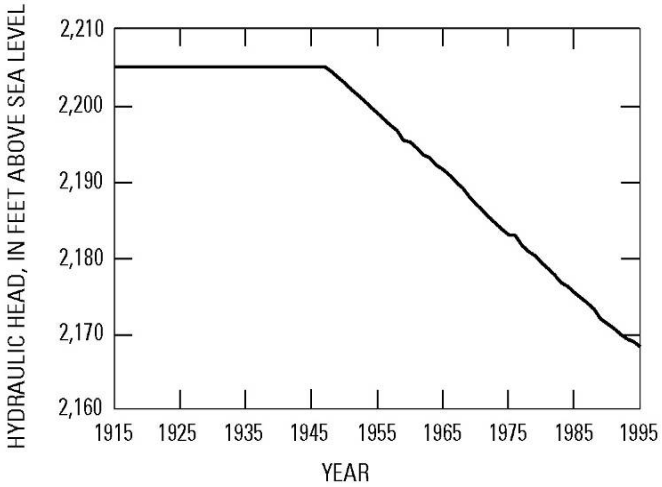

Figure 14. Time-varying specified hydraulic head used for the north boundary of the ground-water flow model of the Antelope Valley ground-water basin, California (modified from Nishikawa and others, 2001).

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A comparison of the spatial distribution of pumpage in the database and land-use data for 1961 and 1987 indicated that the database does not have pumpage data for areas of agricultural land use in the West Antelope and the western Neenach subbasins. The land-use data showed that about 6.8 percent of the total agricultural land in the study area was in these areas; therefore, the annual agricultural pumpage for these areas was assumed to be 6.8 percent of the total annual agricultural pumpage. Agricultural pumpage in the West Antelope and the western Neenach subbasins was distributed to model cells corresponding to the location of the agricultural land use. Pumpage in these areas was assumed to have occurred between 1934 and 1986: this assumption was based on a comparison of simulated water levels and measured water levels for well 8N/17W-1N1 (well location shown in fig. 15) in the West Antelope subbasin.

The spatial distribution and quantity of pumpage for public supply for 1919–91was determined from the pumpage database compiled by Templin and others (1995) and for 1992–95 from water-use information compiled for this study (Table A1 in the Appendix). The location and quantity of pumpage from public supply wells is well documented, and was not changed during the calibration process.

Because there was limited well-construction data available, all wells were assumed to be fully perforated in both layers 1 and 2. The proportion of pumpage from a layer was determined by dividing the transmissivity of that layer by the sum of the transmissivity of layers 1 and 2. The transmissivity of layer 1 was calculated as the product of hydraulic conductivity and initial (1915) saturated thickness. The vertical distribution of pumpage from layers 1 and 2 varied spatially but did not vary with time; therefore, a limitation of this approach is that the vertical distribution of pumpage does not change as the water table declines. In the aquifer system, changes in the saturated thickness of the upper aquifer changes the transmissivity of the upper aquifer, which affects the flow of water to wells. It was assumed that there was no pumpage from layer 3 because few wells in Antelope Valley are deep enough to penetrate the lower aquifer and because the transmissivity of this layer is low. This assumption is valid particularly for the earlier part of the simulation period when rates for total annual pumpage were highest. During the latter part of the simulation period, wells were drilled in the lower aquifer (layer 3) and thus some pumping occurred from this aquifer. The limited pumping that occurred only from the lower aquifer was simulated as pumpage from layers 1 and 2.

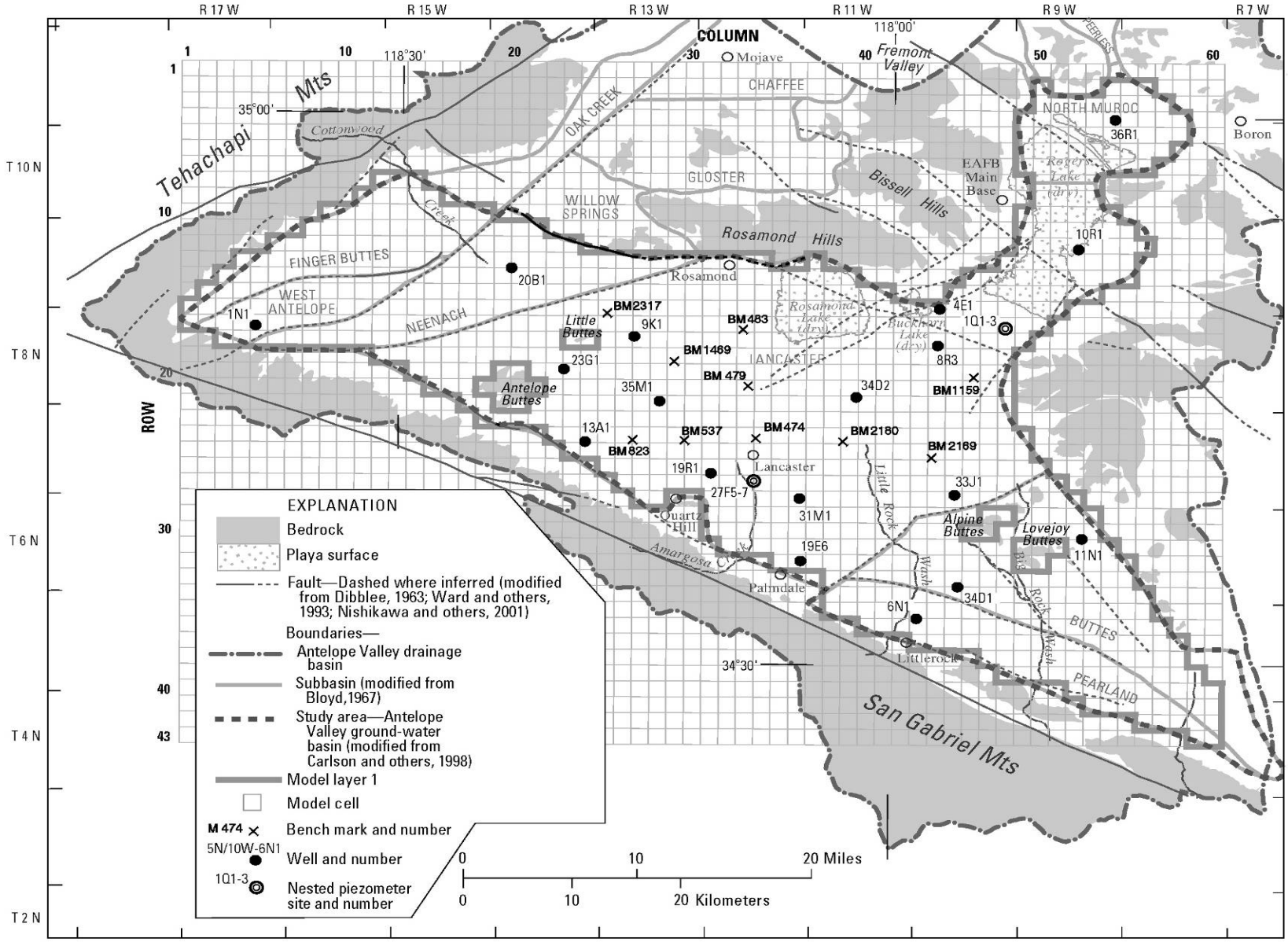

Figure 15. Location of wells and bench marks used to calibrate the transient-state model of the Antelope Valley ground-water basin, California.

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Model Calibration

Model calibration is the process of making adjustments, within justifiable ranges, to initial estimates of selected model parameters and stresses to obtain reasonable agreement between simulated and measured values (for this model, water levels and land subsidence). Modifications were made to the initial estimates of the hydraulic conductivity of layer 1, the transmissivity of layer 2, specific yield, natural recharge, aquitard thickness, hydraulic characteristics of horizontal flow barriers, and preconsolidation head using a trial-and-error approach. Vertical leakance was recalculated after changes were made to any of the values used to calculate vertical leakance; hydraulic conductivity, transmissivity, or saturated thickness. The values of transmissivity and storage coefficient of layer 3 were not changed from the initial values during the model calibration process because reasonable changes in these values had negligible affect on model results.

Prior to 1915, there was little ground-water development in Antelope Valley and the ground-water flow system was in a time-averaged state of equilibrium. Inflows from recharge were balanced by outflows as evapotranspiration and ground-water underflow, and water levels were essentially unchanging. This state of equilibrium was simulated by the steady-state model that represents conditions in 1915. The addition of stress to the ground-water flow system owing to pumping resulted in an imbalance between inflows and outflows, which disturbed the state of equilibrium and resulted in time-varying or transient-state conditions. Ground-water conditions during the period 1915–95 were simulated with a transient-state model. During the calibration process both steady-state and transient-state simulations were used: the steady-state simulation was used to provide initial conditions for the transient-state simulation. Any changes made to the transient-state simulation were incorporated into the steady-state simulation and the steady-state simulation was rerun to ensure that the changes made during the transient-state simulation produced reasonable results for steady-state conditions. This process was repeated until a satisfactory match between measured and simulated results was obtained.

Steady-State Simulation

The steady-state simulation of 1915 conditions was made to provide initial conditions for the transient-state simulation. The steady-state simulation requires initial estimates of hydraulic conductivity, transmissivity, vertical leakance, hydraulic characteristics of horizontal flow barriers, natural recharge, and evapotranspiration (maximum evapotranspiration rate and extinction depth). Storage coefficients are not required for a steady-state simulation.

For this study, only estimates of natural recharge and evapotranspiration were modified during the initial steady-state calibration. Initial estimates of hydraulic conductivity, transmissivity, vertical leakance, and hydraulic characteristics were modified during the transient-state calibration. A subsequent steady-state simulation was then run to verify that the changes made during the transient-state simulation to these parameters resulted in a reasonable steady-state simulation of 1915 conditions. Ground-water level measurements, made around 1915, from 21 wells were used to determine if the steady-state simulation provided reasonable initial conditions for the transient-state simulation (fig. 16, table 6).

The final calibrated distribution of natural recharge is shown in figure 17; recharge ranged from 65 to 3,250 acre-ft/yr per cell.Total natural recharge in the calibrated steady-state simulation was 30,300 acre-ft/yr, 10,400 acre-ft/yr less than the natural recharge simulated in the Durbin (1978) model (40,700 acre-ft/yr). Most of the reduction in simulated natural recharge occurred in the Pearland and Buttes subbasins; natural recharge was decreased from an initial estimate of 26,500 acre-ft/yr (Durbin, 1978) to 16,200 acre-ft/yr. Simulated water levels were higher than the measured water levels in these subbasins when the initial value of natural recharge was simulated. No reasonable combination of hydraulic conductivity, transmissivity, and values of hydraulic characteristic of flow barriers resulted in acceptable simulated water levels for these subbasins when the initial value of natural recharge was used in the steady-state simulation.

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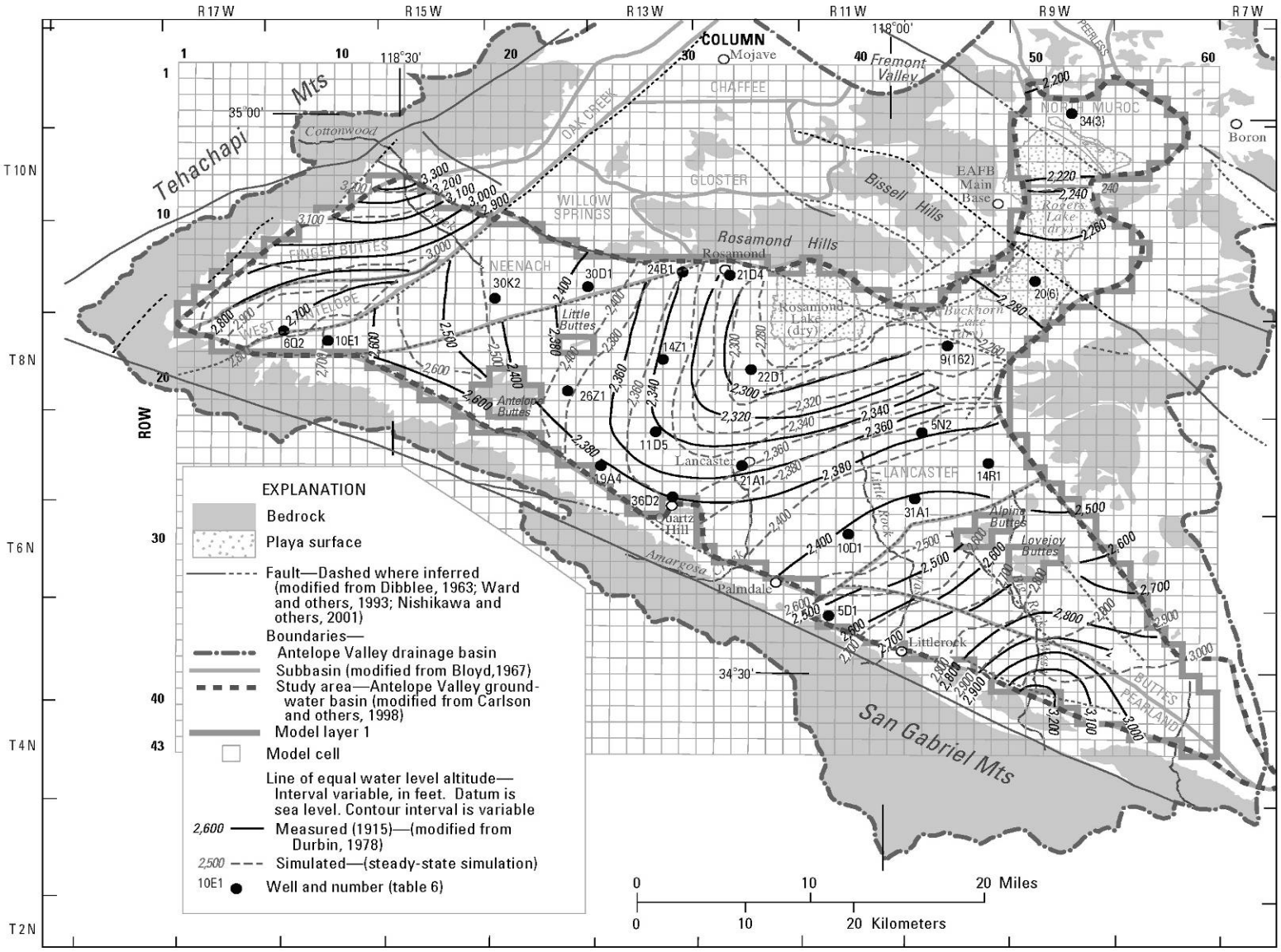

Figure 16. Location of wells used to calibrate the steady-state simulation and measured and simulated steady-state water levels from the ground-water flow model of the Antelope Valley ground-water basin, California.

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Table 6. Measured and simulated (layer 1) water levels for wells used to calibrate the steady-state simulation of the ground-water flow model of the Antelope Valley ground-water basin, California

[State well No.: see well-numbering diagram; see figure 17 for location of wells; well depth in feet below land surface; water levels in feet above sea level; —, no data]

State well No.	Subbasin	Well depth	Year of measurement	Water levels		Difference, feet
				Measured	Simulated	
5N/11W-5D1	Pearland	403	1917	2,600	2,630	30
6N/11W-10D1	Lancaster	445	1915	2,430	2,434	4
7N/10W-5N2	Lancaster	404	1921	2,380	2,381	1
7N/10W-14R1	Lancaster	—	1921	2,403	2,414	11
7N/10W-31A1	Lancaster	300	1921	2,421	2,424	3
7N/12W-21A1	Lancaster	301	1915	2,354	2,346	–8
7N/13W-11D5	Lancaster	351	1917	2,341	2,351	10
7N/13W-19A4	Lancaster	75	1908	2,368	2,367	–1
7N/13W-36D2	Lancaster	466	1914	2,368	2,356	–12
8N/10W-9 (162)[1]	Lancaster	25±	1921	2,303	2,308	5
8N/12W-22D1	Lancaster	371	1910	2,278	2,283	5
8N/13W-14Z1	Lancaster	200	1907	2,348	2,357	9
8N/14W-26Z1	Lancaster	—	1909	2,376	2,382	6
8N/16W-6Q2	West Antelope	302	1909	2,824	2,847	23
8N/16W-10E1	Neenach	—	1909	2,682	2,701	19
9N/9W-20 (6)[1]	Lancaster	—	1917	2,275[3]	2,253	–22
9N/12W-21D4	Lancaster	89	1909	2,316	2,318	2
9N/13W-24B1	Lancaster	63	1908	2,359	2,353	–6
9N/13W-30D1	Neenach	62	1908	2,400	2,439	39
9N/14W-30K2	Neenach	255	1908	2,445	2,494	49
11N/9W-34 (3)[1]	North Muroc	260	—[2]	2,196	2,224	28

[1]Number in parenthesis is the map number of the well as recorded by Thompson (1929, p. 348)
[2]Measured after 1915; Thompson (1929, p. 364)
[3]Flowing

The initial maximum simulated evapotranspiration rate of 0.6 ft/yr and extinction depth of 10 ft below land surface were unchanged. Specifying a higher maximum rate had little effect on model results, and specifying a lower maximum evapotranspiration rate resulted in simulated water levels that were significantly higher than the measured water levels.

The simulated steady-state water levels for layer 1 ranged from 22 ft lower to 49 ft higher than the measured water levels (table 6). The simulated water levels for wells in the Lancaster subbasin were within 12 ft of the measured water levels except for well 9N/9W-20(6) for which the simulated water levels were 22 ft lower than the measured water levels. The simulated water levels ranged from 19 to 49 ft higher than the measured water levels in wells in the Neenach and West Antelope subbasins. The simulated water level for the single calibration well in the Pearland subbasin was 30 ft higher than the measured water level. The differences between the simulated and measured water levels in the Neenach, West Antelope, and Pearland subbasins were large because hydrologic data for these subbasins were limited. For wells in the Buttes and Finger Buttes subbasins, there were no water-level measurements available to calibrate the steady-state model.

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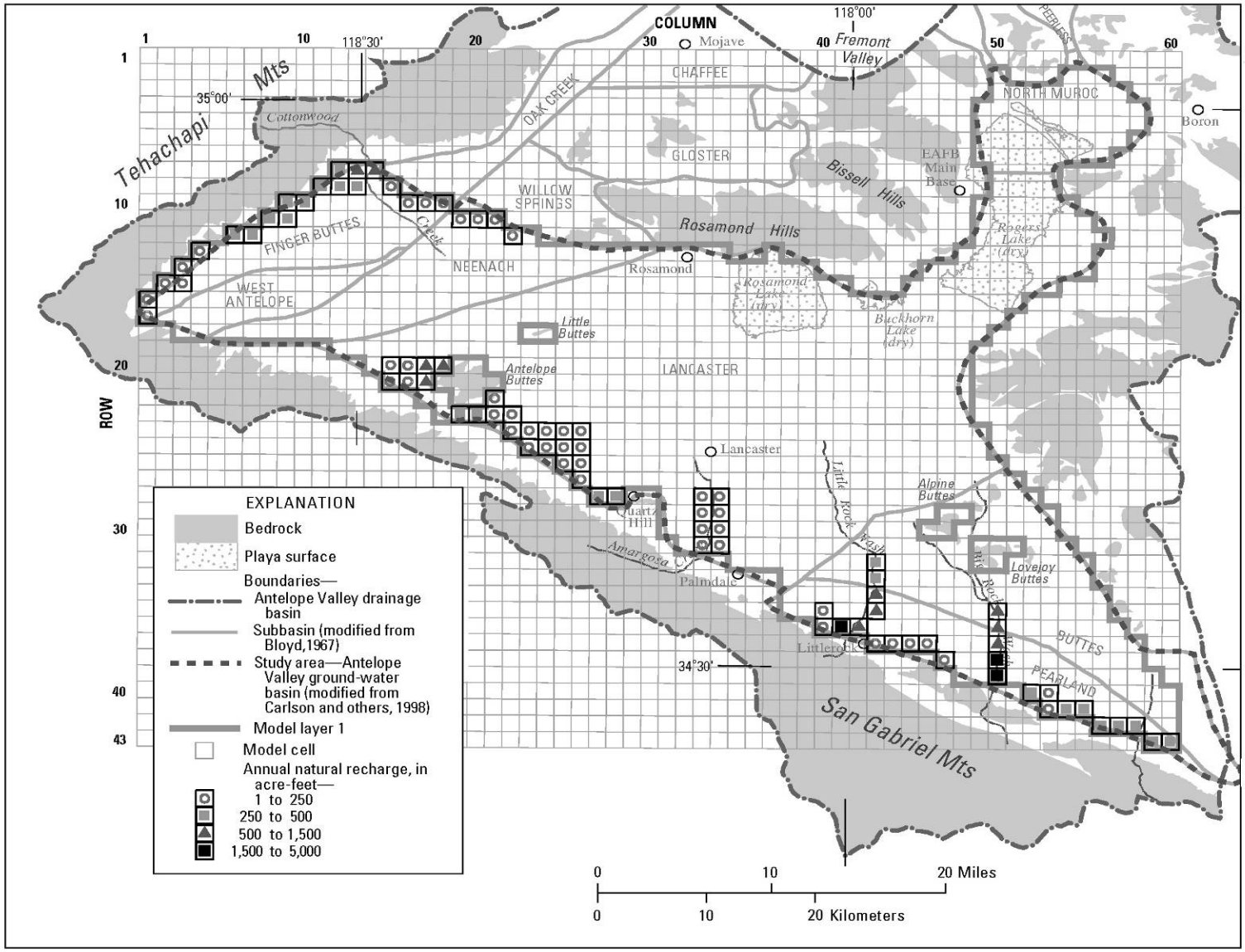

Figure 17. Areal distribution of natural recharge specified in the ground-water flow model of the Antelope Valley ground-water basin, California.

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Contours of measured and simulated layer 1 water levels for 1915 are plotted together for comparison purposes on figure 16. Ground-water flow direction inferred from the contours of simulated water levels is similar to flow direction inferred from the 1915 measured water-level contours. Ground-water flow is from recharge areas along the valley margins to discharge areas around the playas and the north boundary of the model. In the north Lancaster and North Muroc subbasins, the simulated water-level gradient to the north is less than the measured gradient. The largest differences between the measured and simulated water-level contours are in the Finger Buttes and Pearland subbasins: in these subbasins, the simulated water-level gradient is less than the measured gradient. The accuracy of the measured 1915 water-level contours for these two subbasins, however, is uncertain owing to the lack of available water-level data.

Transient-State Simulation

Calibration of the transient-state model involved trial-and-error adjustments of horizontal hydraulic conductivity, transmissivity, vertical leakance, storage coefficient, hydraulic characteristic of barriers, preconsolidation head, and artificial recharge of irrigation-return flows. New values of vertical leakance were calculated during the calibration process to incorporate changes in the hydraulic conductivity and saturated thickness of layer 1 and the transmissivity of layers 2 and 3. Model parameters for the area north of Willow Springs Fault (barrier 7 on figure 11) were modified from values used in the Edwards Air Force Base ground-water flow and land subsidence model (Nishikawa and others, 2001).

The transient-state model was calibrated using available water-level data from 24 wells for the period 1915–95 and subsidence data from 10 bench marks for the period 1926–92 (fig. 15). Data from 19 of the 24 wells were used to compare measured and simulated water levels over time; the wells were selected on the basis of the length of water-level records and the spatial distribution of the wells. Data from two nested piezometer sites (wells 7N/12W-27F5–27F7 near Lancaster and wells 8N/10W-1Q1–1Q3 south of Rogers Lake) were used to compare the simulated and measured vertical hydraulic-head gradient between layers. The selection of the bench marks was based on the length of subsidence record and spatial distribution of the bench marks. The transient-state model was assumed to be calibrated when the simulated water levels matched the general magnitude and trend of the measured water levels, the general flow directions inferred from contours of the simulated water levels matched flow directions inferred from the contours of measured water levels, the onset and magnitude of land subsidence matched measured land subsidence, and the model parameters were within reasonable limits supported by the available geohydrologic data.

The calibrated values of the horizontal hydraulic conductivities used for layer 1 ranged from 2 to 30 ft/d (fig. 18). Modifications were made to the initial values of horizontal hydraulic conductivity primarily for the areas southwest, south, and east of Rosamond Lake and for the Buttes subbasin. For these areas, few, if any, aquifer-test data were available to estimate the transmissive properties of the aquifer. In the area around Rosamond Lake, water levels that were simulated using the initial values of horizontal hydraulic conductivity were too low; therefore, the initial values were decreased to increase the simulated water levels. Lacustrine deposits are present in the upper aquifer in this part of the basin (fig. 3), which may explain the low simulated hydraulic conductivity values. In the southeast part of Buttes subbasin, the horizontal hydraulic conductivity was decreased from an initial value of 10 ft/d to a value of 2 ft/d. In the northwest part of the subbasin, horizontal hydraulic conductivity was increased from an initial value of 25 to 30 ft/d in order to lower simulated water levels in the northwestern parts of the Buttes and Pearland subbasins.

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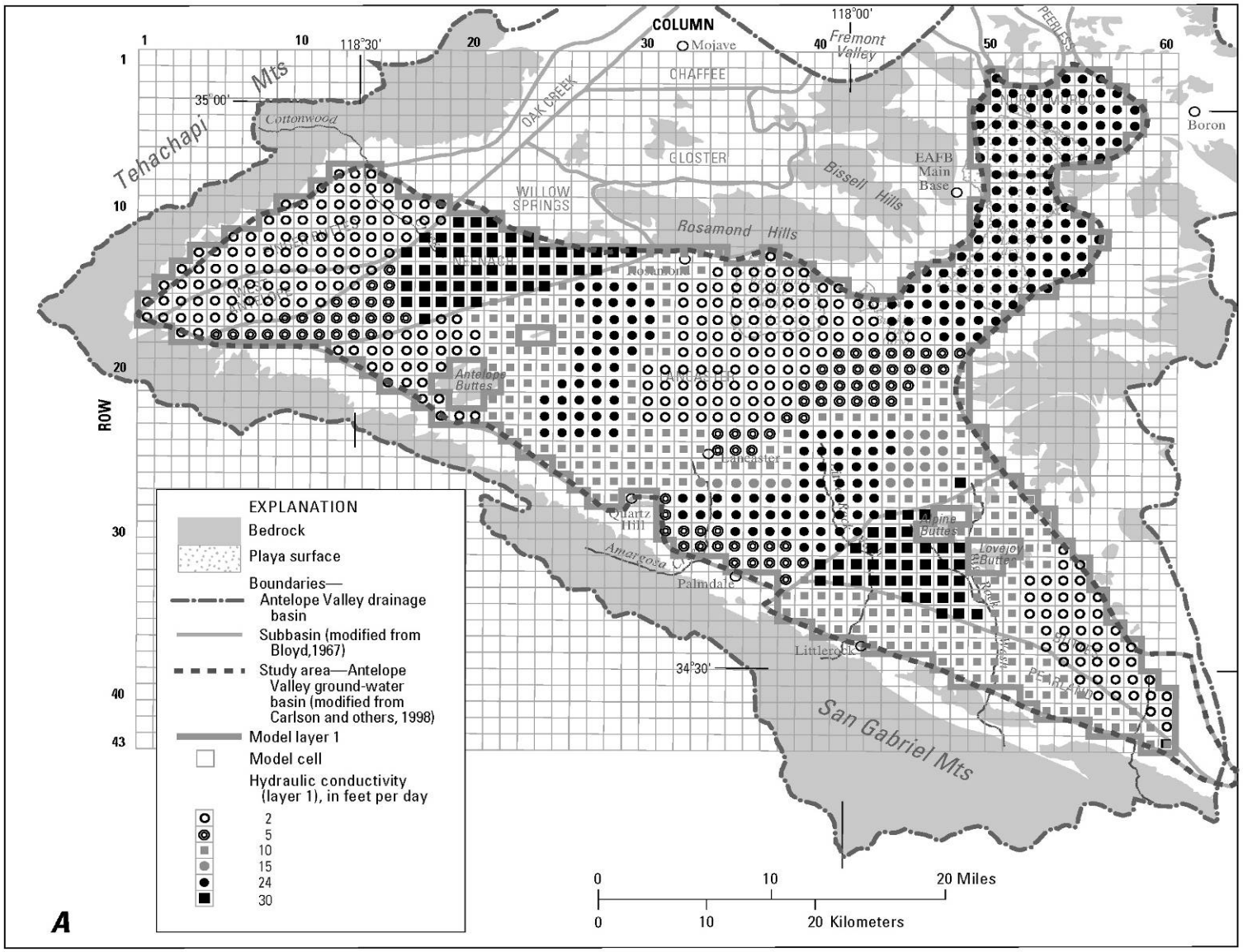

Figure 18. Areal distribution of ***(A)*** hydraulic conductivity for layer 1 and transmissivity for ***(B)*** layer 2 and ***(C)*** layer 3 in the ground-water flow model of the Antelope Valley ground-water basin, California.

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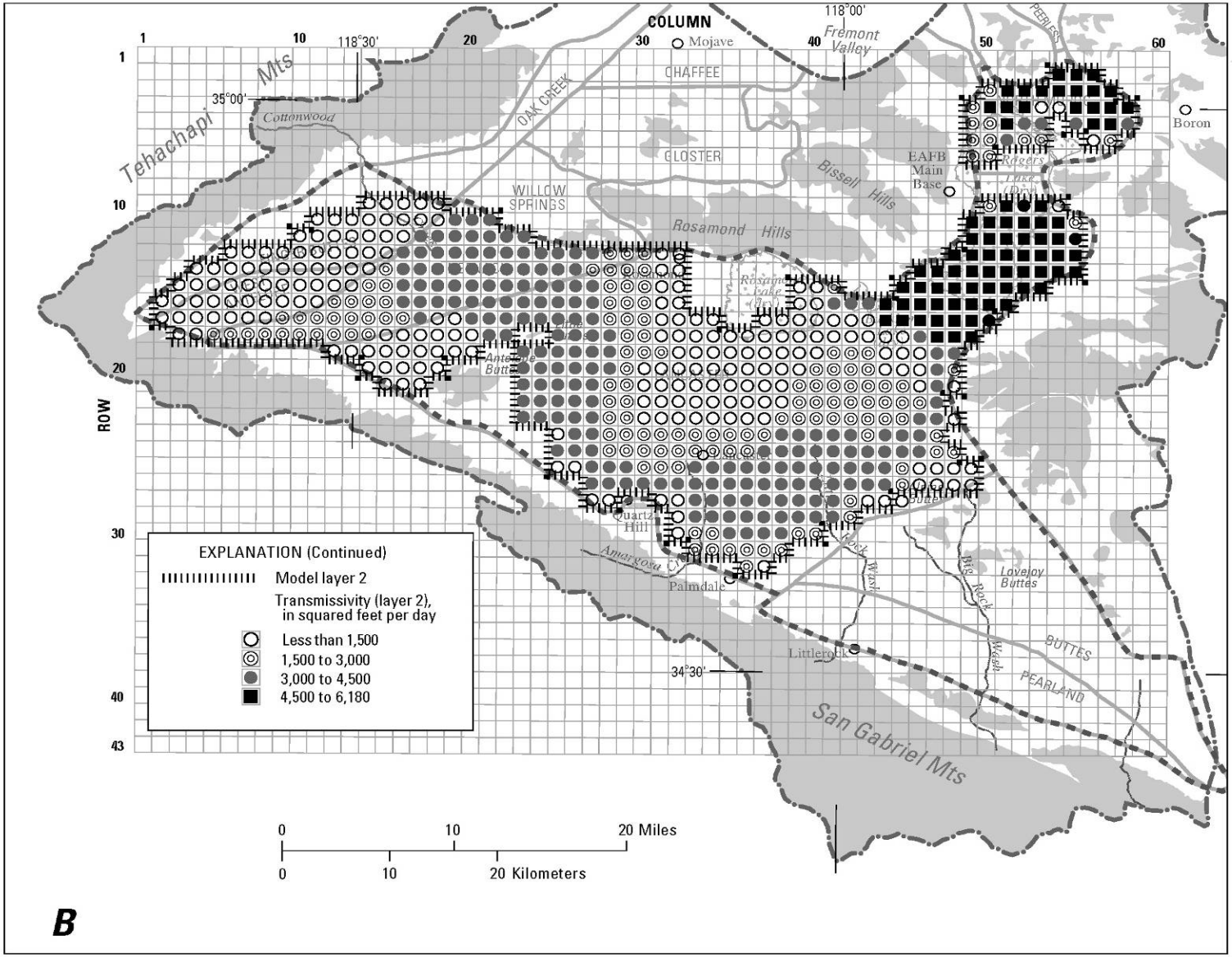

Figure 18.—Continued.

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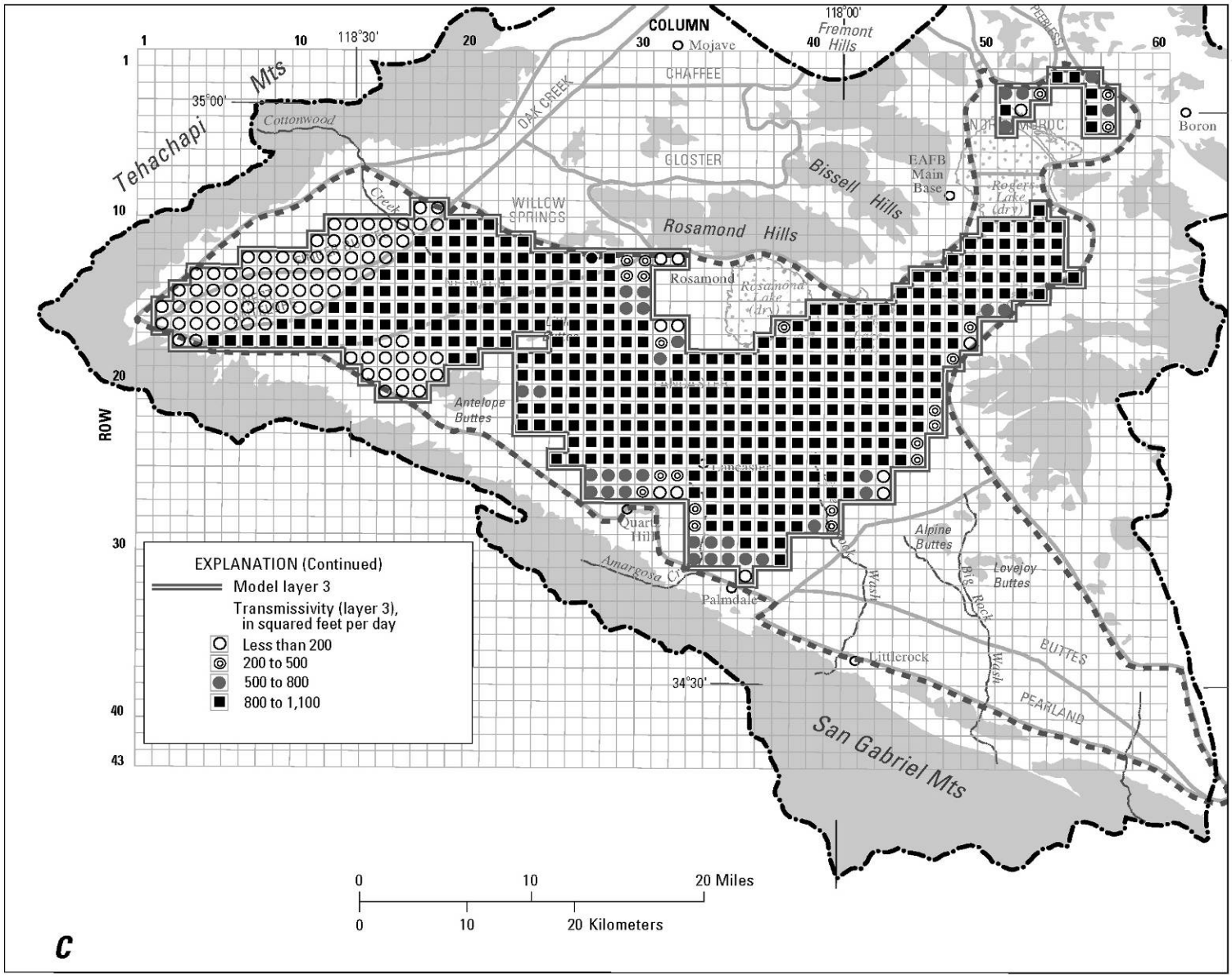

Figure 18.—Continued.

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Transmissivity was specified for layers 2 and 3 in the model. Transmissivity was calculated outside the model using horizontal hydraulic conductivity and layer thickness. The horizontal hydraulic conductivity used to calculate the initial values of transmissivity for layer 2 was 10 ft/d. The thickness of layer 2 is 400 ft, except where the altitude of bedrock is higher than the 1,550 ft above sea level. During the calibration process, the horizontal hydraulic conductivity of layer 2 was adjusted in some areas to represent a distribution of sediments, which, in most cases, are coarse near the mountain fronts and fine near the valley center. For the area surrounding Rosamond Lake and south nearly to the city of Lancaster, the horizontal hydraulic conductivity used to calculate transmissivity for layer 2 was decreased to 2 ft/d. A transition zone having a horizontal hydraulic conductivity of 5 ft/d was specified between this area and the area to the south, which has a hydraulic conductivity of 10 ft/d. As required in layer 1, the horizontal hydraulic conductivity of layer 2 was decreased from 10 ft/d to 2 ft/d for the Finger Buttes and West Antelope subbasins and the western part of the Neenach subbasin. The horizontal hydraulic conductivity around the city of Palmdale was decreased from 10 ft/d to 5 ft/d to simulate the measured water-level declines in this area. Transmissivity for the area around Edwards Air Force Base was calculated using a horizontal hydraulic conductivity of 15 ft/d (Nishikawa and others, 2001). The calibrated transmissivities of layer 2 (fig. 18*B*) ranged from 11 to 6,000 ft^2/d.

The transmissivity of layer 3 was calculated using a hydraulic conductivity of 2 ft/d. The thickness of layer 3 is 550 ft, except where the altitude of bedrock is greater than 1,000 ft above sea level. The transmissivities of layer 3 (fig. 18*C*) ranged from 24 to 1,100 ft^2/d and were not adjusted during the calibration process.

The vertical leakance between layers was calculated outside of the model using equation 2. The vertical hydraulic conductivity of a layer that contains lacustrine deposits was assumed equal to 1.0×10^{-2} ft/d. The vertical hydraulic conductivity of a layer that does not contain lacustrine deposits was assumed equal to one-hundredth of the horizontal hydraulic conductivity of that layer. Vertical-leakance values were recalculated to reflect changes in horizontal hydraulic conductivity, transmissivity, and saturated thickness. The final calibrated values for vertical leakance ranged from 5.1×10^{-8} to 8.1×10^{-4} ft/d between layers 1 and 2 and from 7.1×10^{-6} to 1.04×10^{-4} ft/d between layers 2 and 3 (fig. 19). Calibration of vertical leakance in the model was difficult because the vertical hydraulic-head gradient has been measured at only a few sites.

Barriers to horizontal ground-water flow, such as faults, simulated in the model are shown in figure 11 and the final calibrated hydraulic characteristic values are presented in table 5. The hydraulic characteristic value of most of the faults simulated in this model initially were based on results from previous ground-water flow models [barriers 1–4 (Durbin, 1978) and barriers 5–7 (Nishikawa and others, 2001)]. The initial hydraulic-characteristic values of the barriers were modified during the calibration process to obtain acceptable water-level differences across the barriers. The northwest-southeast trending barrier (8), southeast of Lovejoy Buttes, was added to the model because the simulated water levels for well 6N/9W-11N1 (fig. 15) were consistently too high in the absence of a partial barrier to flow. Additional data are needed to verify the existence, location, and extent of this barrier. Barrier 9 (fig. 11) was added to the model to simulate the change in horizontal-flow characteristics where lacustrine deposits rise towards land surface and transect the upper and middle aquifers south of Rogers Lake (dry) (fig. 3). At this location, the lacustrine deposits may restrict the horizontal flow of ground water to areas of pumping to the south (Rewis, 1995, fig. 4). The delay and attenuated response, to pumpage, of water levels in well 8N/10W-8R3, located north of where the lacustrine deposits transect the upper and middle aquifers, compared to water levels in well 8N/11 W-34D2, located south of the lacustrine deposits, could not be simulated without simulating a partial barrier (barrier 9, fig. 11) to ground-water flow at this location.

Initial values of specific yield in layer 1 were adjusted for several parts of the study area during the calibration process. The specific-yield values specified for the Neenach subbasin (0.12), for some parts of the Lancaster subbasin (0.12), and for areas east and north of Rogers Lake (0.10) were decreased from initial values (0.15 to 0.20). The calibrated specific-yield value for the part of the Lancaster subbasin near Lancaster (0.12) is consistent with values estimated using coupled microgravity and water-level data (0.13) (Jim Howle, U.S. Geological Survey, written commun., 2002). The specific-yield value specified for the area around Rosamond Lake (0.10) was increased from the initial value (0.05). The final distribution of specific yield (layer 1) is shown in figure 20.

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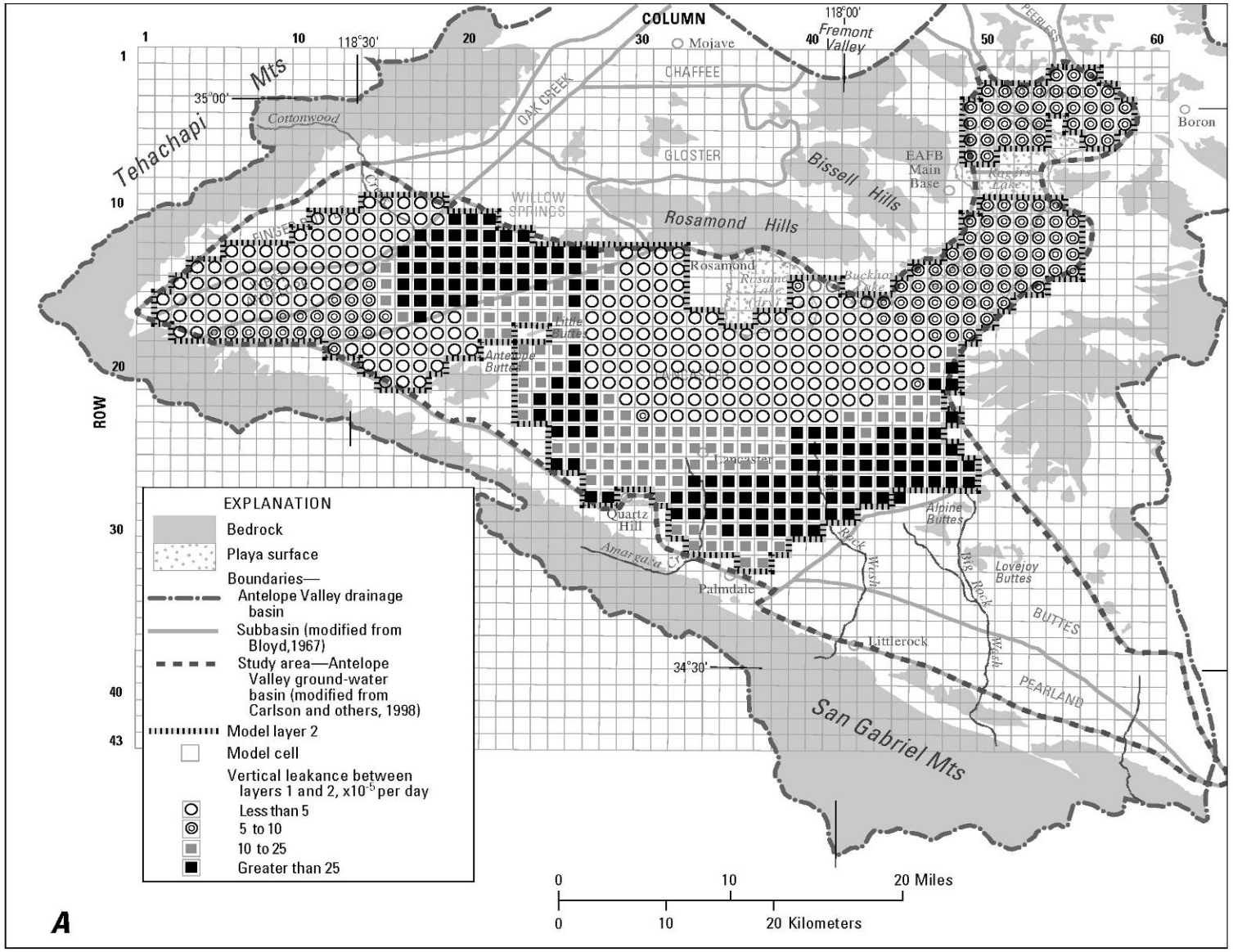

Figure 19. Areal distribution of vertical leakance between ***(A)*** layers 1 and 2 and ***(B)*** layers 2 and 3 in the ground-water flow model of the Antelope Valley ground-water basin, California.

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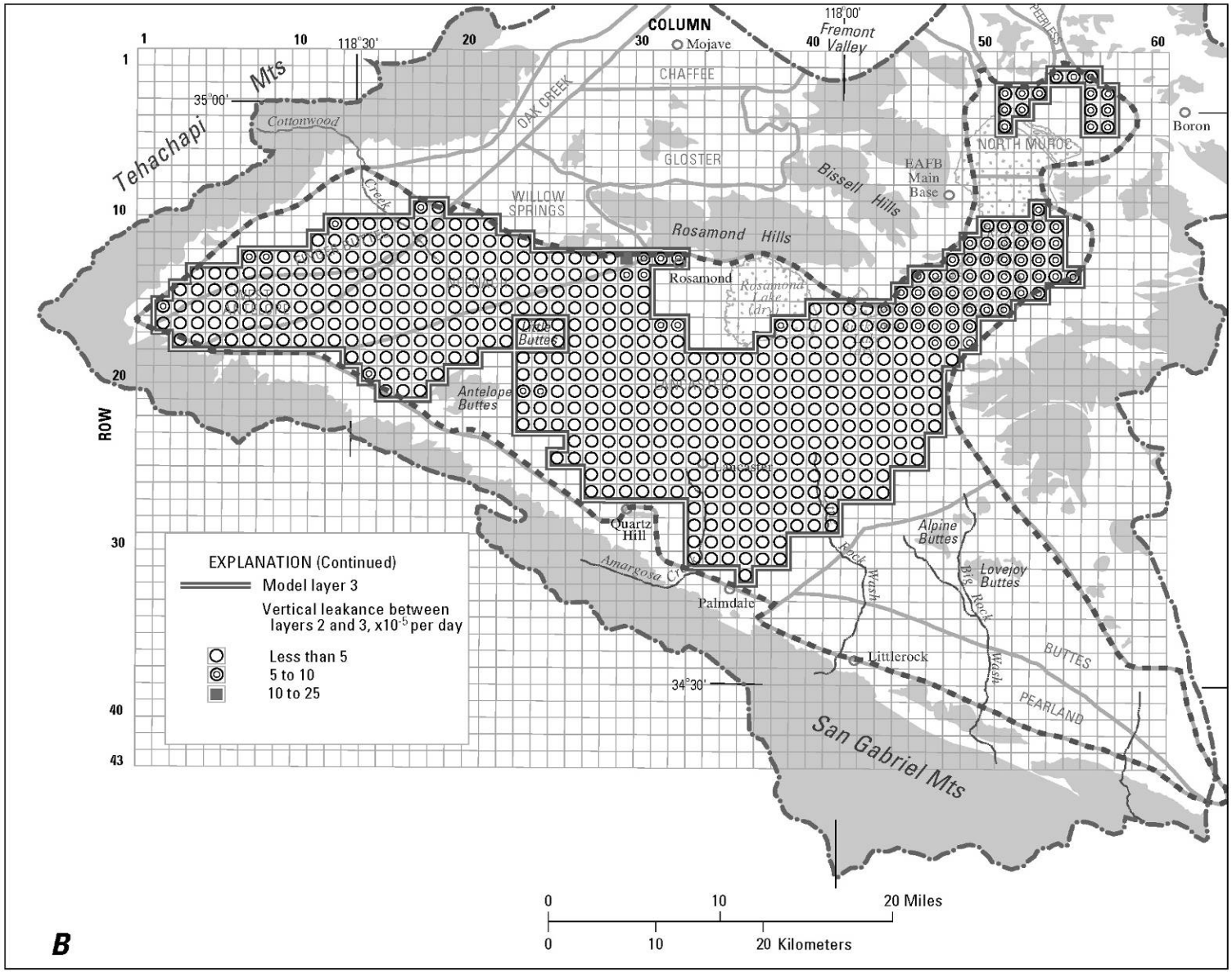

Figure 19.—Continued.

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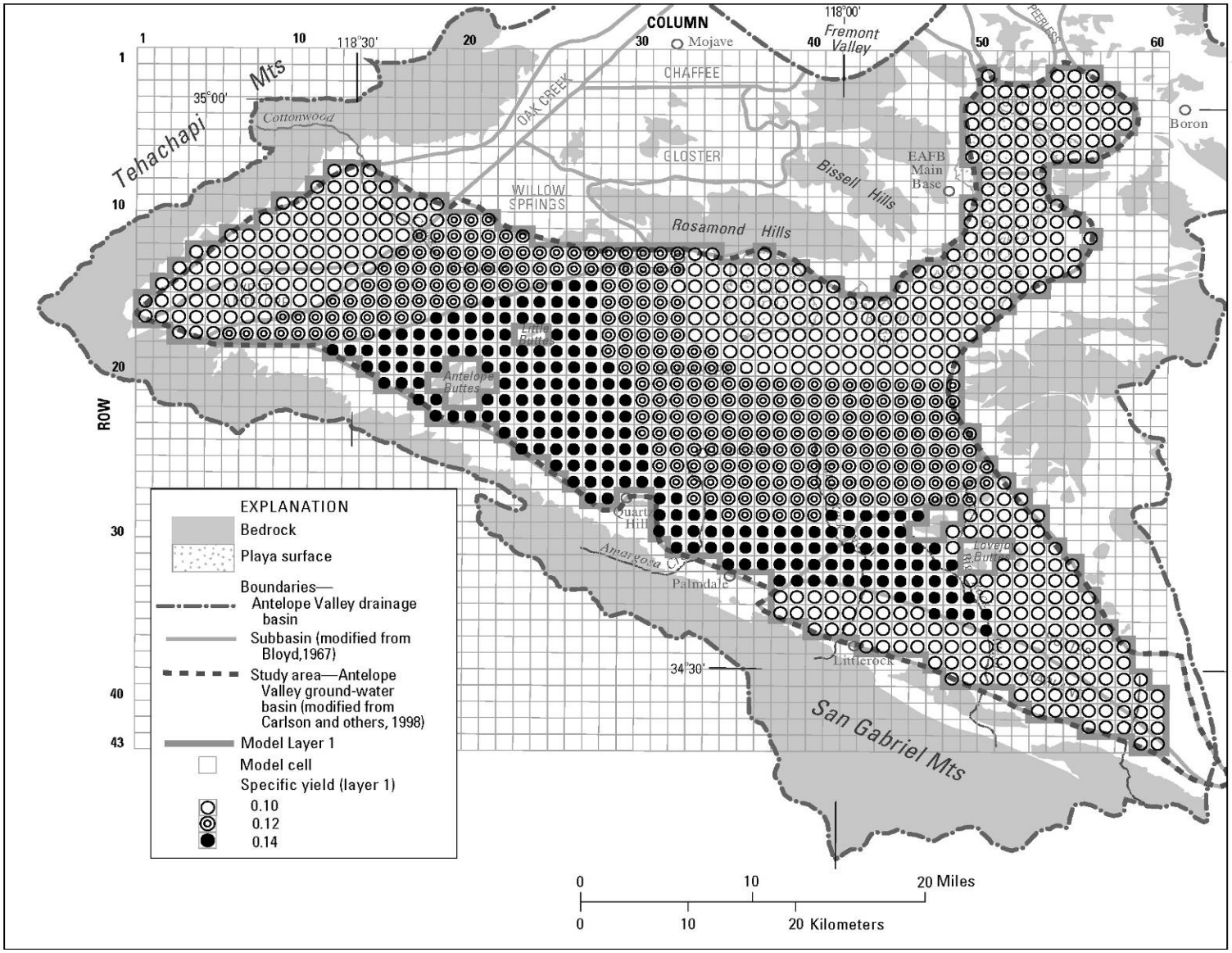

Figure 20. Areal distribution of specific yield in layer 1 of the ground-water flow model in the Antelope Valley ground-water basin, California.

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The initial storage coefficients representing the compressibility of water and elastic skeletal storage were not changed during the calibration process. The storage coefficient representing the compressibility of water ranged from 0.3×10^{-4} to 5.1×10^{-4} in layer 1 (fig. 21*A*) and from 0.1×10^{-4} to 1.7×10^{-4} in layer 2 (fig. 21*B*), depending upon the thickness of saturated sediments in these layers. The elastic skeletal storage coefficient ranged from 1.0×10^{-4} to 2.07×10^{-3} in layer 1 (fig. 22*A*) and from 1.2×10^{-5} to 6.8×10^{-4} in layer 2 (fig. 22*B*). The final inelastic storage coefficient was calculated using an inelastic skeletal specific storage of 1.6×10^{-4} ft^{-1}, which is between the inelastic skeletal specific storage values for thick aquitards (3.5×10^{-4} ft^{-1}) and thin aquitards (4.0×10^{-5} ft^{-1}) reported by Sneed and Galloway (2000). The inelastic skeletal storage coefficient ranged from 2.9×10^{-3} to 3.11×10^{-2} in layer 1 (fig. 23*A*) and from 3.2×10^{-5} to 2.88×10^{-2} in layer 2 (fig. 23*B*). An inelastic skeletal storage coefficient was not specified for areas where subsidence has not been measured historically.

Calibrated preconsolidation head ranged from 0 to 160 ft below steady-state water levels in the area where subsidence was simulated (fig. 24). The preconsolidation head was adjusted until the timing of the onset of simulated subsidence matched measured subsidence. The variability in the calibrated preconsolidation head can be attributed to overconsolidation of the alluvium. Overconsolidlation of an alluvial basin can be caused by removal of overburden by erosion, prehistoric ground-water level declines, desiccation, and diagenesis (Holzer, 1981).

Irrigation-return flows were simulated as 30 percent of the annual quantity of water applied for agricultural irrigation. During the transient-state calibration process it was determined that irrigation-return flows recharged the underlying aquifer 10 years after the water was applied for irrigation. The calibrated delay between the application of irrigation water and the recharge of the irrigation-return flows was supported by the results of a simple unsaturated-zone model completed for this study using representative soil properties and depth to water measurements (Alan Flint, U.S. Geological Survey, written commun., 1999). Irrigation-return flows were applied directly to the model cells where agricultural pumping was simulated. In addition, irrigation-return flows were applied to the model cells where imported water was used for irrigation (fig. 12).

Model Results

Water Levels

Water-level hydrographs for 19 wells were used to compare simulated and measured water levels over time (fig. 25) (well locations shown on figure 15). The measured water levels for two wells (8N/10W-1Q3 and 8N/10W-4E1) were combined into one hydrograph to form a more complete period of record. The simulated water levels generally matched the trends of the measured water levels but did not always match the magnitude.

Twelve of the hydrographs compared simulated and measured water levels in the Lancaster subbasin. In general, the simulated water levels matched the measured water declines of more than 300 ft, which began in the 1920s, soon after pumpage exceeded estimates of natural recharge. In the southern part of the Lancaster subbasin (wells 6N/11W-19E6 and 7N/11W-31M1), the simulated water levels were more than 20 ft higher than the measured water levels after about 1970. In the western part of the Lancaster subbasin, east of Antelope Buttes (wells 7N/14W-13A1, 8N/13W-35M1, and 8N/14W-23G1), the simulated water levels generally were about 30 ft lower than the measured water levels. In the northeastern part of the Lancaster subbasin, the simulated water level in layer 3 at well 8N/10W-8R3 was about 20 ft lower than the measured water level after the late-1950s.

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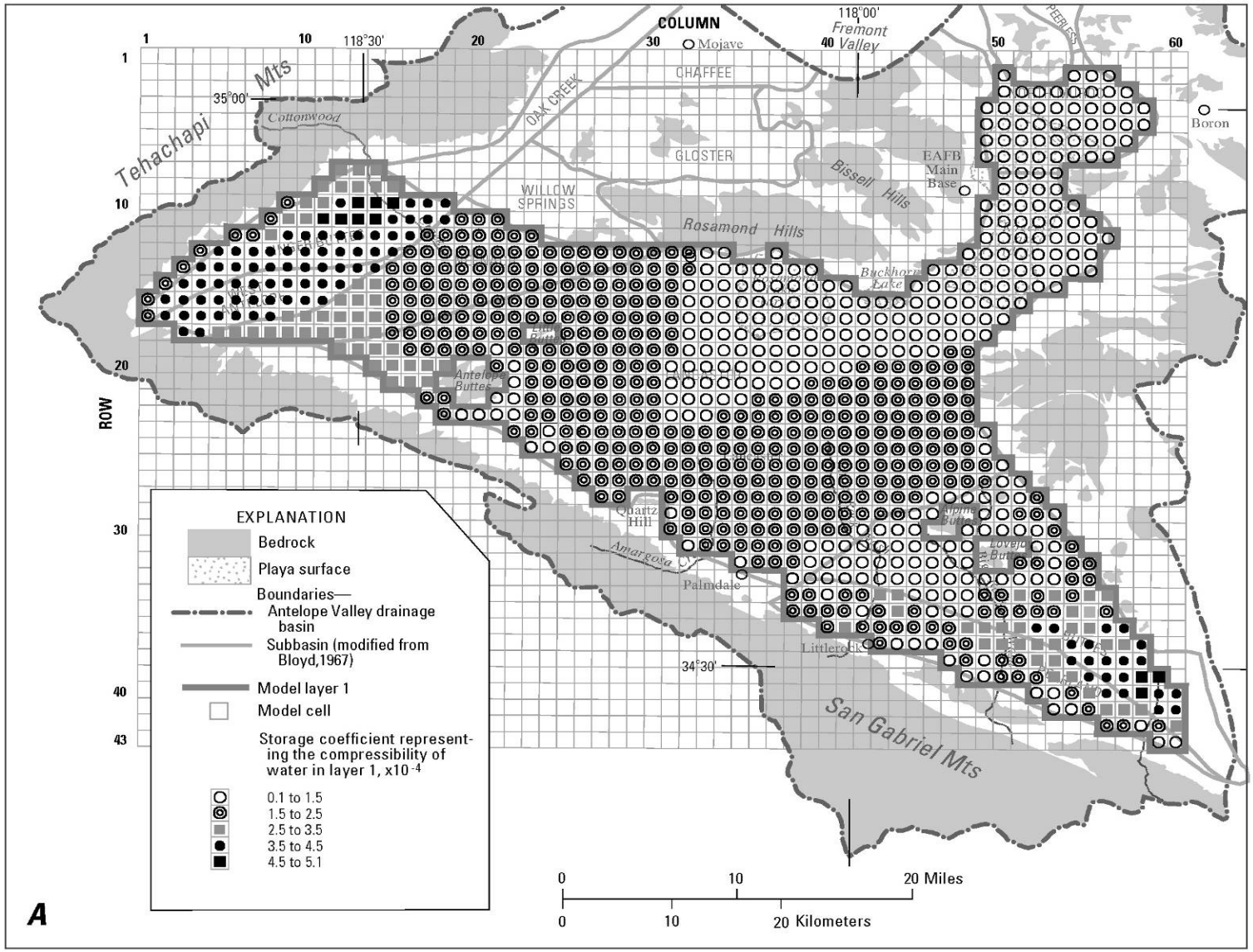

Figure 21. Areal distribution of the storage coefficient representing the compressibility of water for ***(A)*** layer 1 and ***(B)*** layer 2 in the ground-water flow model of the Antelope Valley ground-water basin, California.

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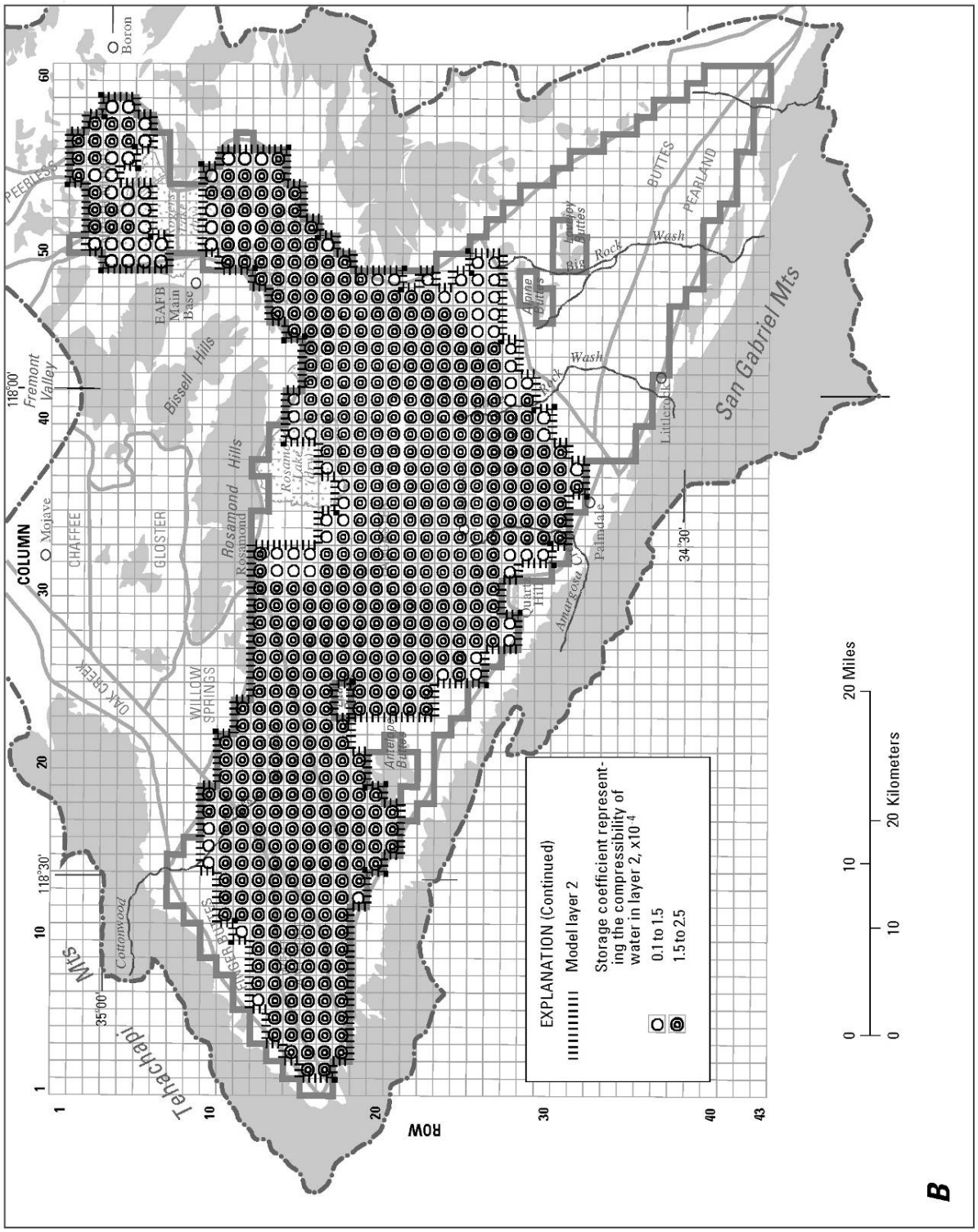

Figure 21.—Continued.

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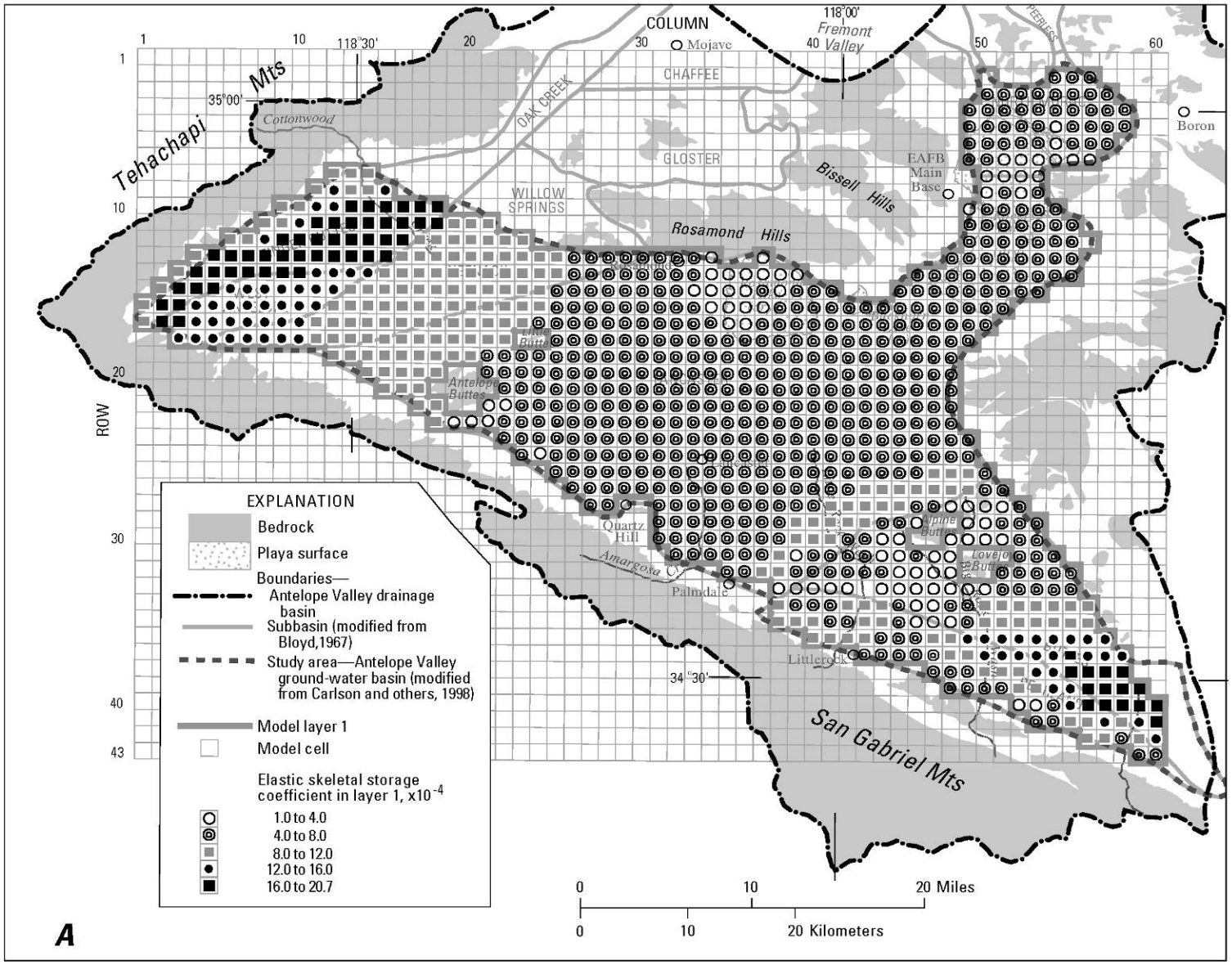

Figure 22. Areal distribution of the elastic skeletal storage coefficient for *(A)* layer 1 and *(B)* layer 2 in the ground-water flow model of the Antelope Valley ground-water basin, California.

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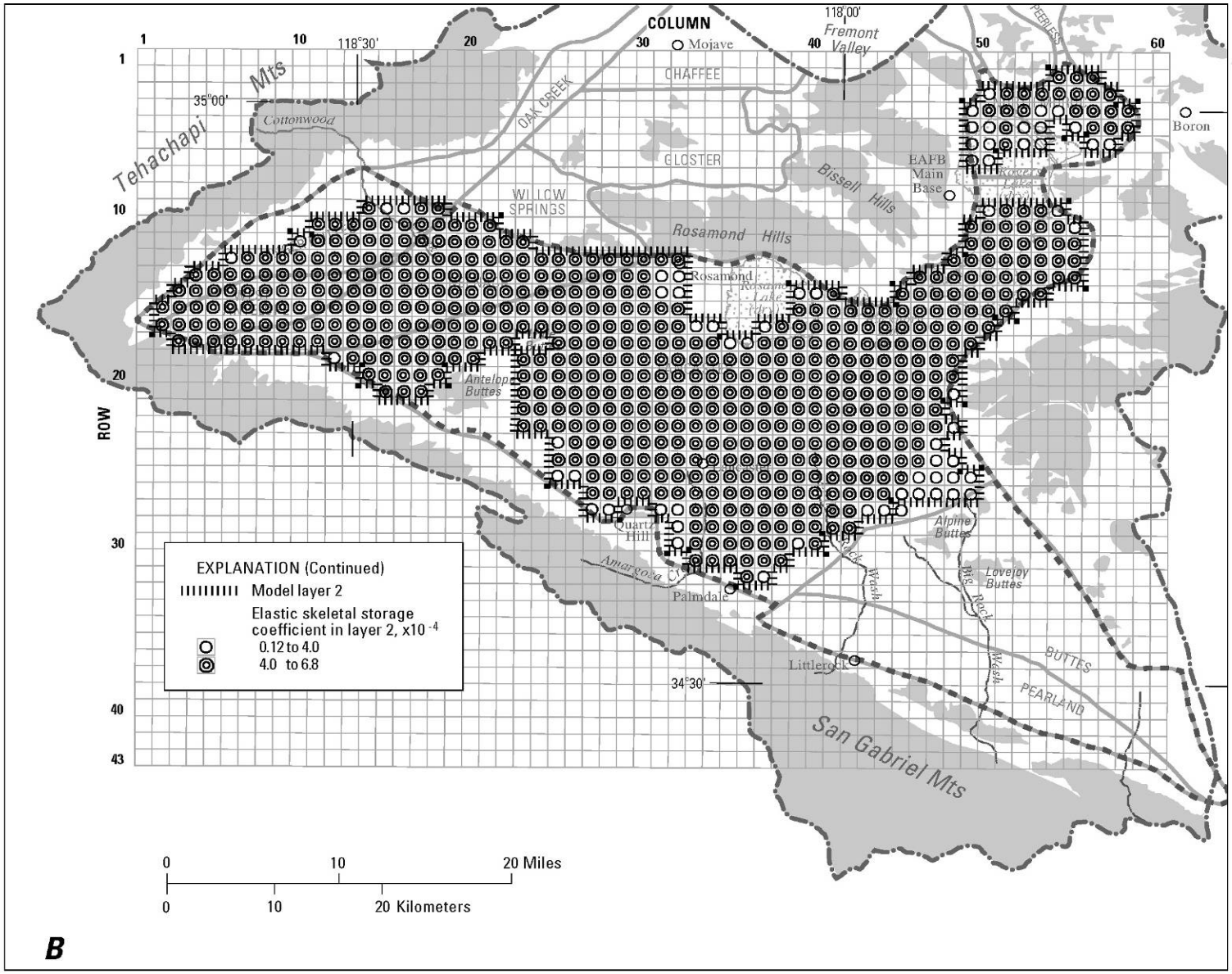

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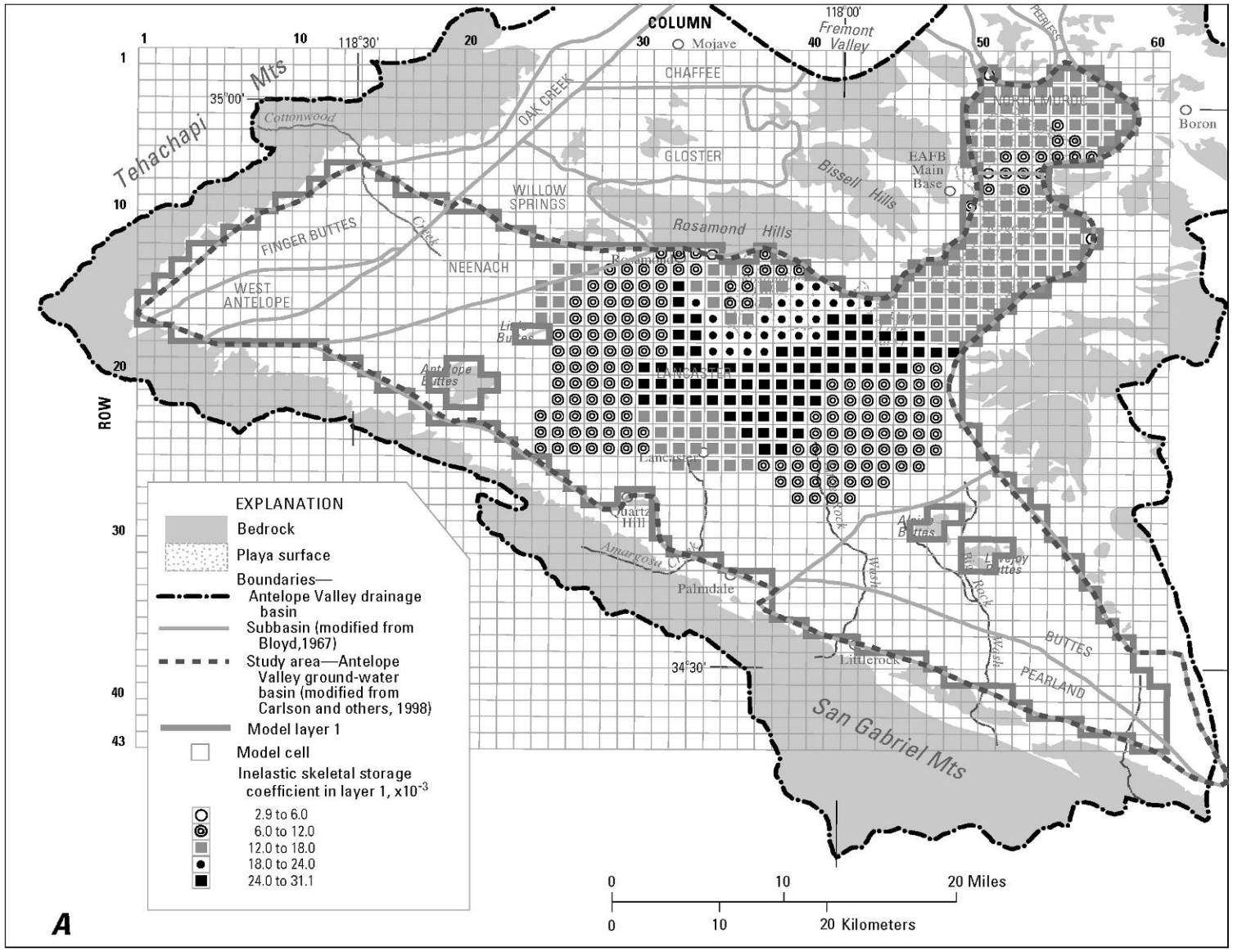

Figure 23. Areal distribution of the inelastic skeletal storage coefficient for *(A)* layer 1 and *(B)* layer 2 in the ground-water flow model of the Antelope Valley ground-water basin, California.

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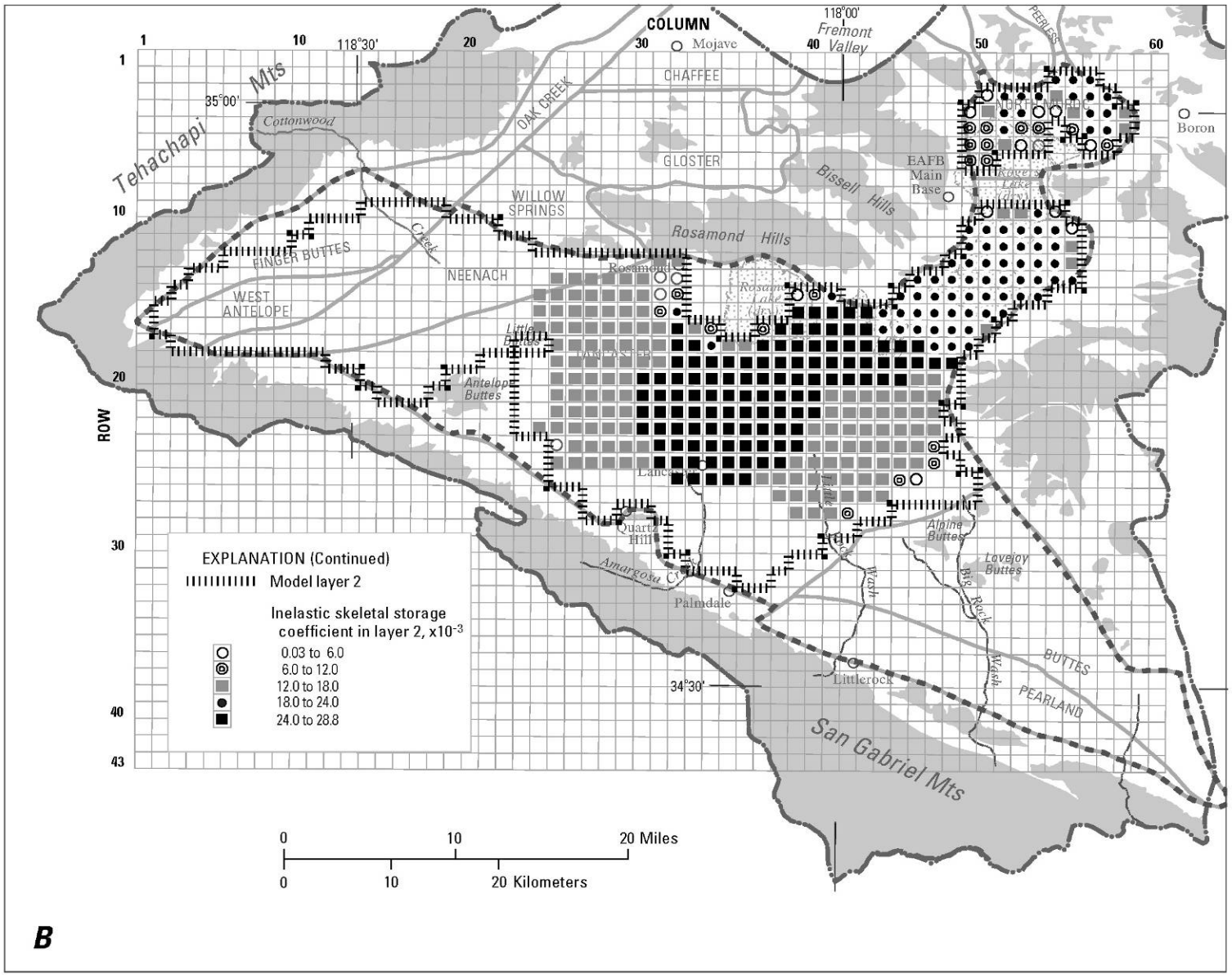

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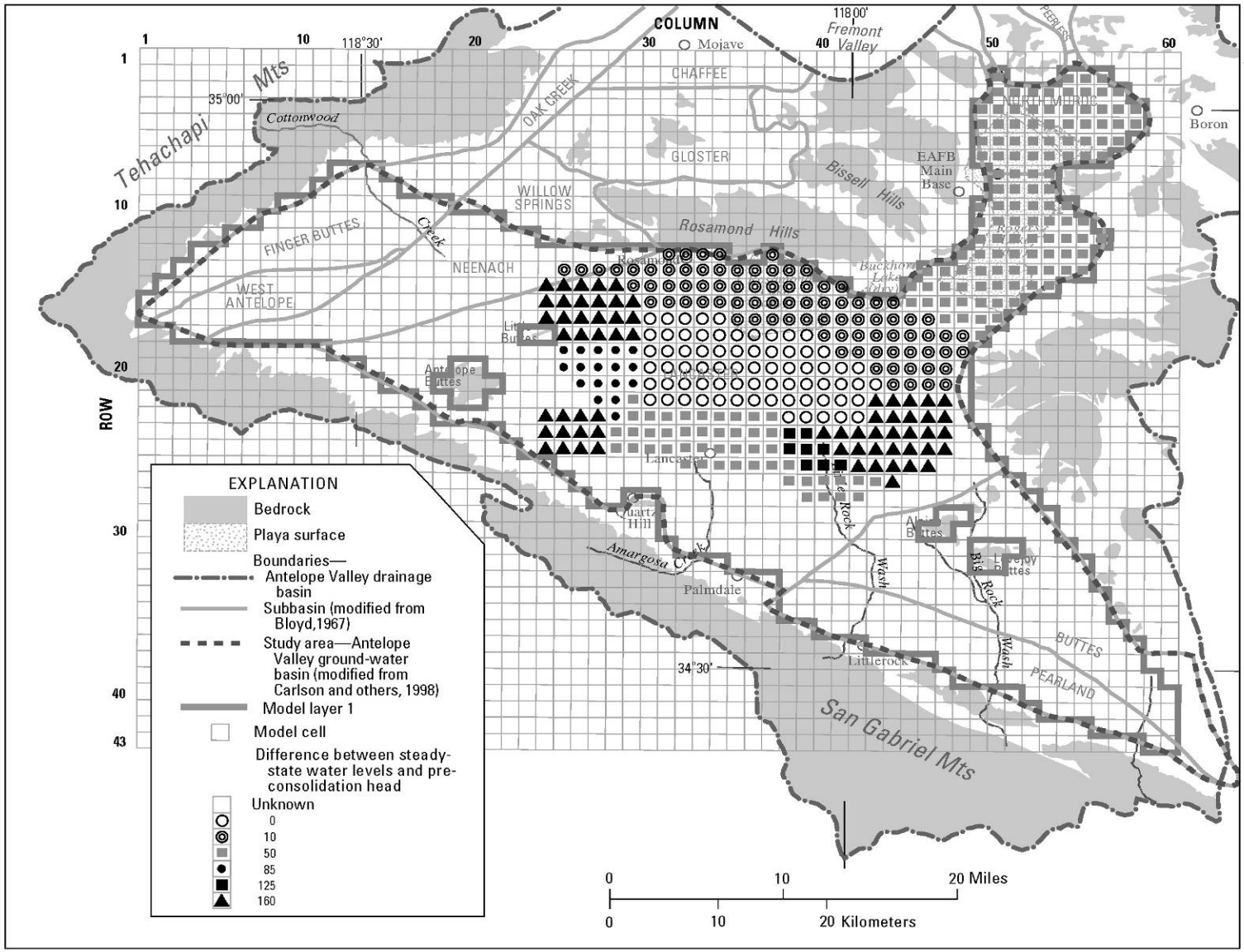

Figure 24. Difference between steady-state water levels and preconsolidation head in the ground-water flow model of the Antelope Valley ground-water basin, California.

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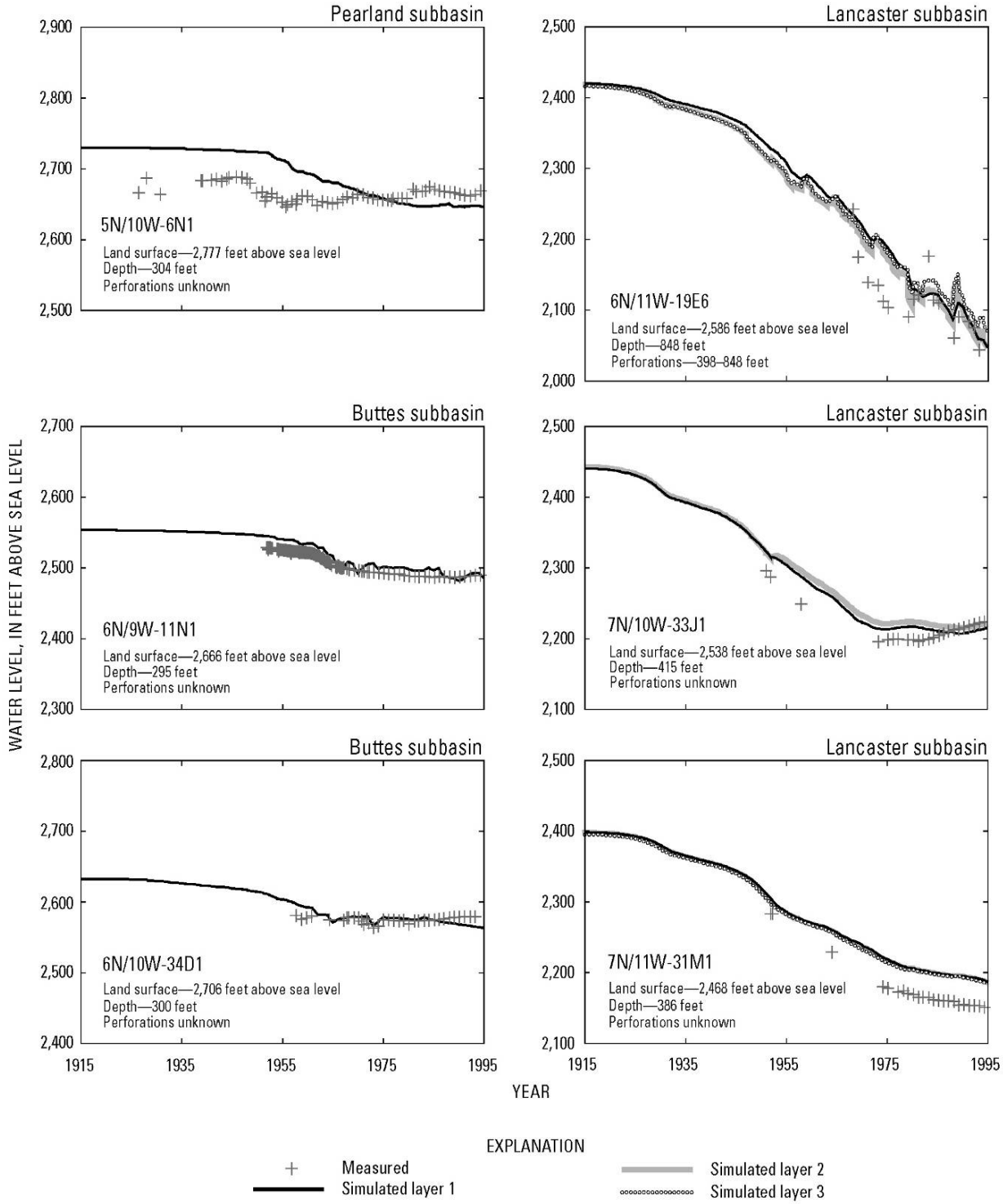

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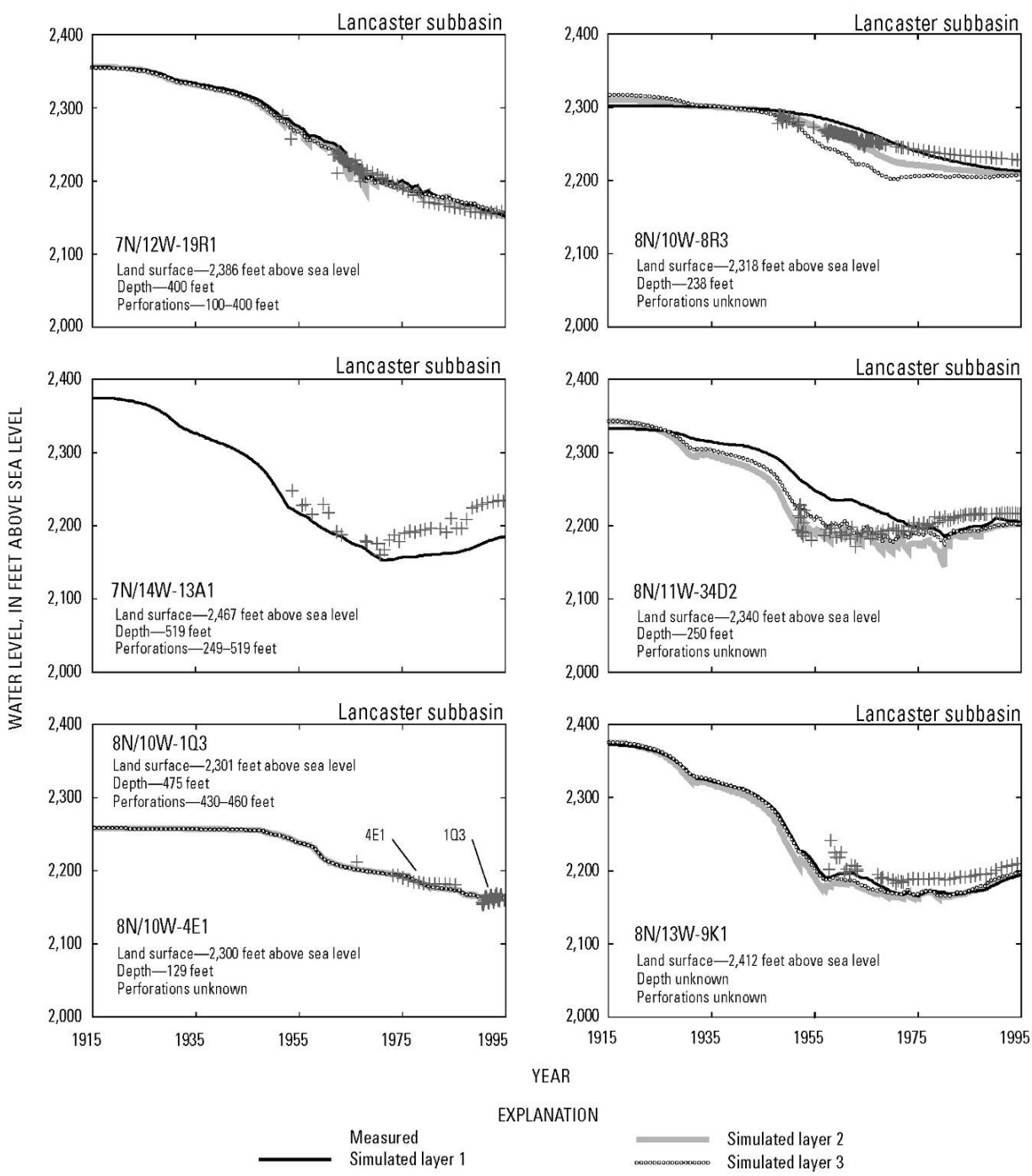
Figure 25. Measured and simulated water levels at selected wells in the Antelope Valley ground-water basin, California, 1915–95. (See figure 15 for location of wells.)



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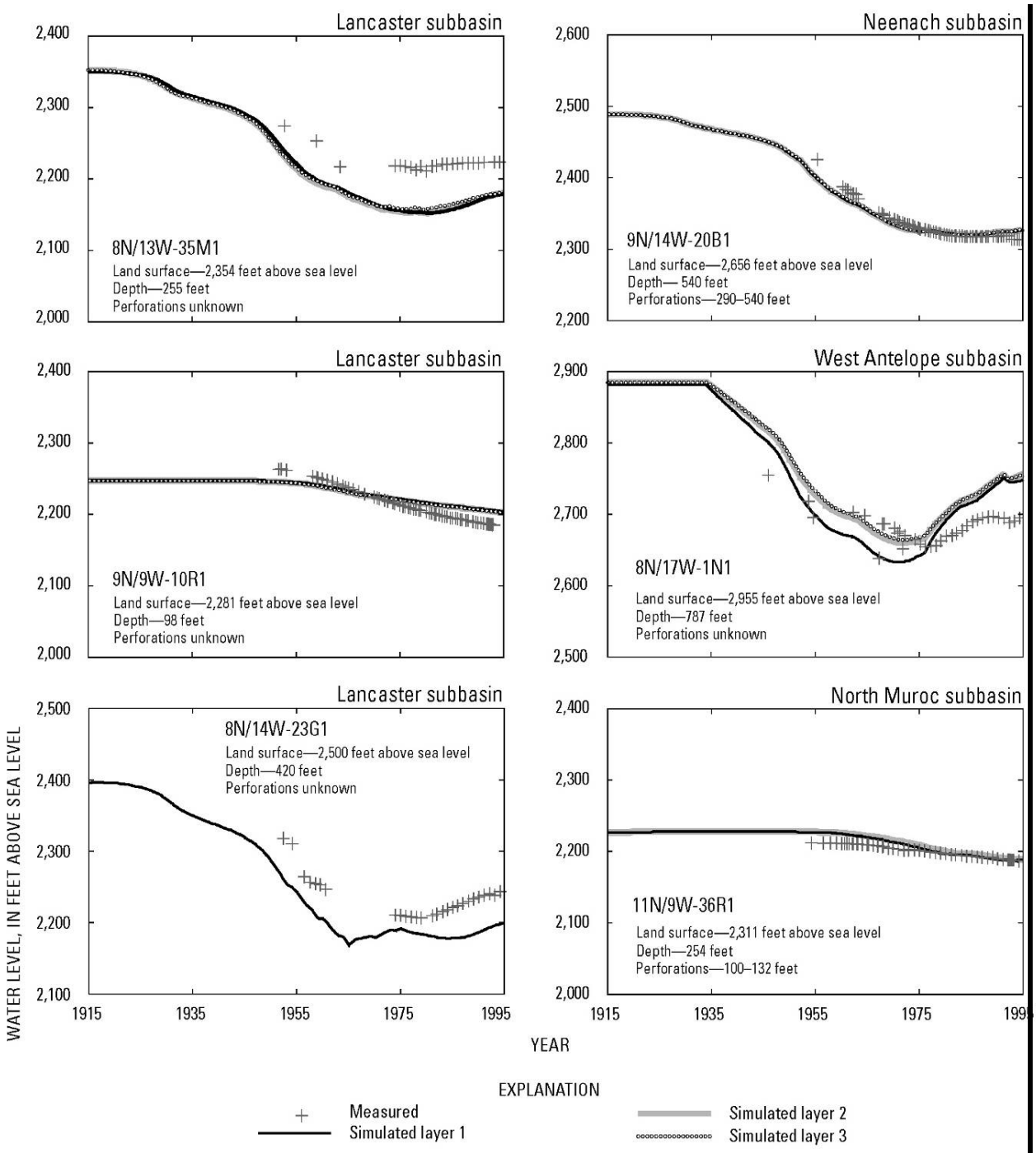

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Figure 25.—Continued.

In the Buttes subbasin (wells 6N/9W-11N1 and 6N/10W-34D1), measured and simulated water levels matched well. In the Pearland subbasin (well 5N/10W-6N1), the simulated water levels were higher than the measured water levels prior to the 1970s and were lower than the measured water levels after the 1970s. The simulated water level was about 24 ft lower than the measured water level by the end of the simulation period. In the West Antelope subbasin (well 8N/17W-1N1), the simulated water levels matched the measured water levels well through the 1970s, but the simulated water level overestimated the measured water-level rise that occurred from the mid 1970s to 1995 by as much as 65 ft. Because there are virtually no data for this subbasin in the pumpage database, the estimated quantity and distribution of annual pumpage were based only on 1961 land-use data. In addition to the lack of pumpage data for the West Antelope subbasin, there are uncertainties in the estimates of the quantity and distribution of recharge from irrigation-return flows of water delivered by the AVEK Water Agency. It was assumed that water delivered by the AVEK Water Agency was applied to fields near the area where the water was discharged from the aqueduct. In the Neenach subbasin (well 9N/14W-20B1) and the North Muroc subbasin (well 11N/19W-36R1), the simulated and measured water levels matched well.

The simulated water-level gradient between model layers at the end of the model simulation (1995) was compared with the measured February 1996 water-level gradient at nested piezometers 7N/12W-27F5 –27F7 in the southern part of the Lancaster subbasin and the measured October 1995 water-level gradient at nested piezometers 8N/10W-1Q1-3 in the northeastern part of the Lancaster subbasin (table 7). In the southern Lancaster subbasin, the measured data indicated that there was an upward water-level gradient, with the largest water-level difference (14 ft) between the middle and lower aquifers (layers 2 and 3). The lacustrine deposits separate the middle and lower aquifers in this part of the subbasin (fig. 3).The model simulated an upward water-level gradient at this site, but the simulated water-level difference between layers 2 and 3 was 11 ft, about 3 ft less than measured water-level difference. In the northeastern Lancaster subbasin, the measured data indicated that there was a small downward water-level gradient; the difference between measured water levels for wells 8N/10W -1Q1–1Q3 was 1–2 ft (table 7). Simulated water levels for the three layers were within 1 ft of each other at this site, indicating little or no vertical ground-water movement at this site. The lacustrine deposits are near land surface in this area (Londquist and others, 1993); these three wells are all perforated below the lacustrine deposits.

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Table 7. Measured and simulated water levels at two sites with nested piezometers completed at multiple depths in the Lancaster subbasin of the Antelope Valley ground-water basin, California.

[State well No.: See well-numbering in text]

Layer	Wells 7N/12W-27F5–7 Land surface altitude: 2,443 feet above sea level				Wells 8N/10W-1Q1–3 Land surface altitude: 2,301 feet above sea level			
	State well No. of nested piezometer	Perforated interval, in feet below land surface	Measured water level, February 1996, in feet above sea level	Simulated water level, 1995, in feet above sea level	State well No. of nested piezometer	Perforated interval, in feet below land surface	Measured water level, October 1995, in feet above sea level	Simulated water level, 1995, in feet above sea level
1	[1]27F7	505–525	2,138	2,156	[2]1Q3	430–460	2,154	2,159
2	[1]27F6	705–725	2,139	2,161	[2]1Q2	605–635	2,153	2,159
3	[2]27F5	905–925	2,153	2,172	[2]1Q1	980–1,010	2,152	2,160

[1] Above the lacustrine clay.
[2] Below the lacustrine clay.

Contours of simulated 1995 and measured 1996 (Carlson and others, 1998) water levels for layer 1 are shown in figure 26. The measured 1996 water-level contours were assumed to be representative of 1995 conditions and were used to qualitatively evaluate the transient-state simulation. The model does a good job of simulating the observed pumping depression near Lancaster and Palmdale, an area of recent extensive pumping for public supply. However, the simulated water levels were lower than measured water levels in the eastern and western parts of the Lancaster subbasin. These areas historically were subject to large amounts of agricultural pumping, which was not metered and therefore difficult to estimate. The simulated flat water-level gradient in the northern part of the Lancaster subbasin and the North Muroc subbasin matched the measured water-level gradient in these areas. The simulated water levels matched the measured water levels throughout most of the Neenach subbasin except in the western part of the subbasin. The simulated and measured water levels matched well in much of the Buttes and Pearland subbasins even though the hydrogeologic and agricultural pumpage data for these subbasins were limited. Because of insufficient water-level data for the Finger Buttes, West Antelope, and parts of the Buttes and Pearland subbasins, comparisons could not be made for these subbasins.

Land Subsidence

Simulated land subsidence was compared with periodic surveyed (measured) data collected at 10 bench marks (locations shown in figure 15) since about 1930 (fig 27). Simulated land subsidence is the sum of aquifer-system compaction in layers 1 and 2. Recall, compaction was assumed to be minimal in layer 3, and was not simulated in the model. Pumping-induced subsidence is controlled by the thickness of compressible sediments, preconsolidation head, and water-level declines. Where simulated water-level declines are greater than actual water-level declines or where the aquifer contains a smaller thickness of compressible sediments than was represented in the model, simulated subsidence will be larger than measured subsidence. Simulated subsidence will be smaller than measured subsidence where simulated water-level declines are less than actual water-level declines or where the aquifer contains a larger thickness of compressible sediments than was represented in the model. The MODFLOW package, IBS1, simulates an instantaneous release of water from the compressible interbeds (aquitards) and thus subsidence—and does not account for hydrodynamic lag or residual compaction. This limitation is further discussed in the "Limitations of the Model" section of this report.

Simulated subsidence closely matched measured subsidence at all of the10 bench marks (fig. 27). Simulated subsidence began at most locations in the 1930s, but as early as 1928 at bench mark BM 479 and as late as 1950 at bench mark BM 474. Simulated subsidence was greatest (6.3 ft) at bench mark BM 474 near Lancaster; the maximum measured subsidence also was at this bench mark (Ikehara and Phillips, 1994). Large water-level declines have occurred near bench mark BM 474, and the aquifer contains a substantial thickness of compressible sediments. Simulated subsidence was lowest at bench marks BM 2317 (2.0 ft) and BM 823 (2.17 ft). These two sites are located in areas that historically have been subjected to large amounts of pumpage, but the aquifers in the area contain fewer compressible sediments than aquifers in areas that had greater subsidence. Simulated subsidence also was small at bench mark BM 483 (2.2 ft) even though the aquifer in this area consists of a thick layer of compressible sediments. However, there has been minimal pumping and associated water-level declines in this area. The abrupt increase in simulated subsidence at bench marks BM 474, BM 2180, and BM 2317 in about 1977 corresponds to the increase in pumpage for public supply in 1977 (fig. A2) from the aquifer near these benchmarks.

Although water levels have declined more than 200 ft throughout much of the study area, subsidence greater than 1 ft has been documented only in the central part of the study area (fig. 8). In the area around Palmdale where water-level declines have been large, no measurable subsidence has occurred (Ikehara and Phillips, 1994). This lack of measurable subsidence suggests that this area may not be susceptible to subsidence even though lacustrine deposits have been mapped in this area (fig 3). However, it is possible that water levels may not yet have declined below the preconsolidation head in areas where subsidence has not occurred. Subsidence can be simulated in the model only where inelastic storage is specified; inelastic storage was specified only for areas where measurements have shown that subsidence has occurred.

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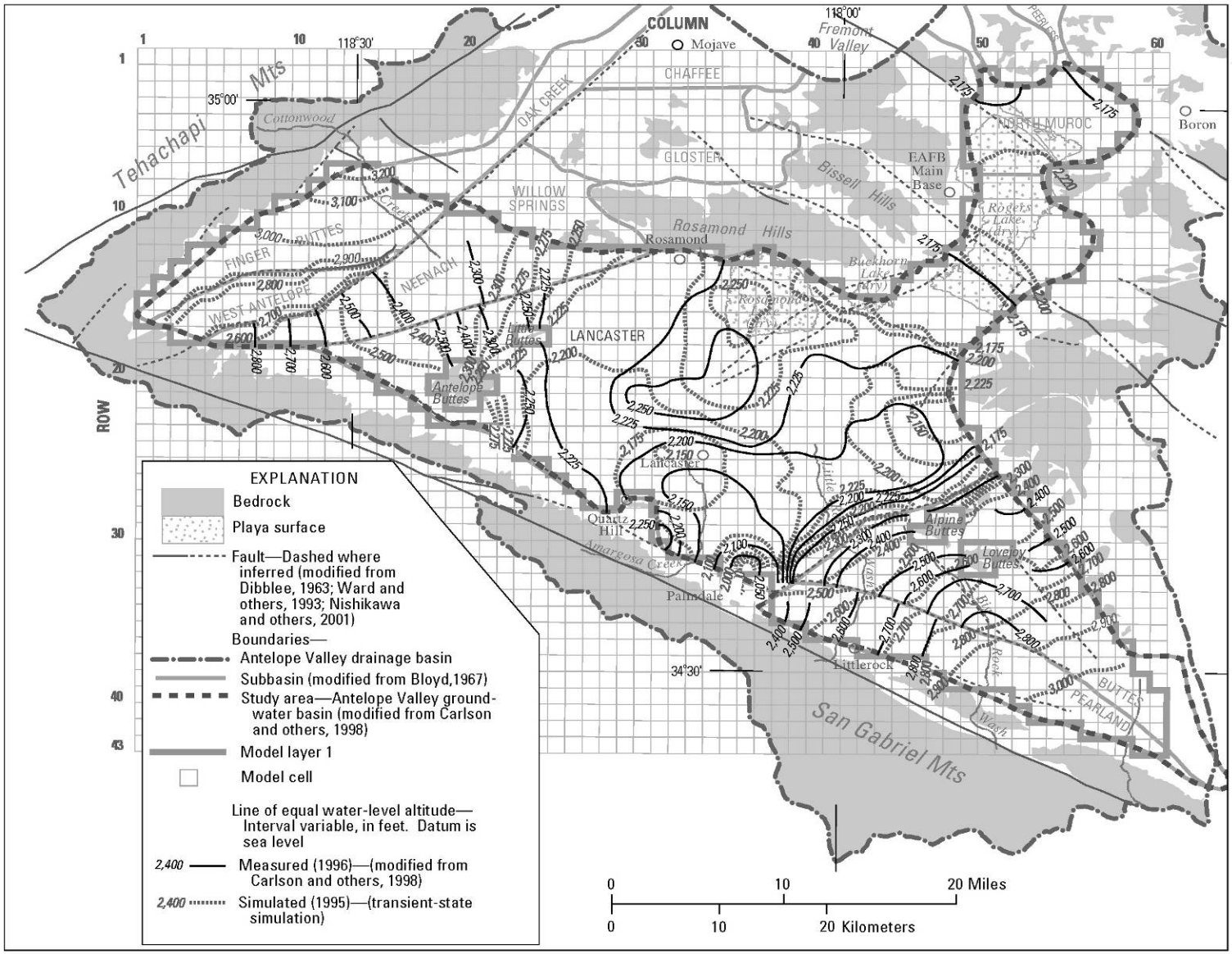

Figure 26. Measured (1996) and simulated (1995) water levels from the ground-water flow model of the Antelope Valley ground-water basin, California.

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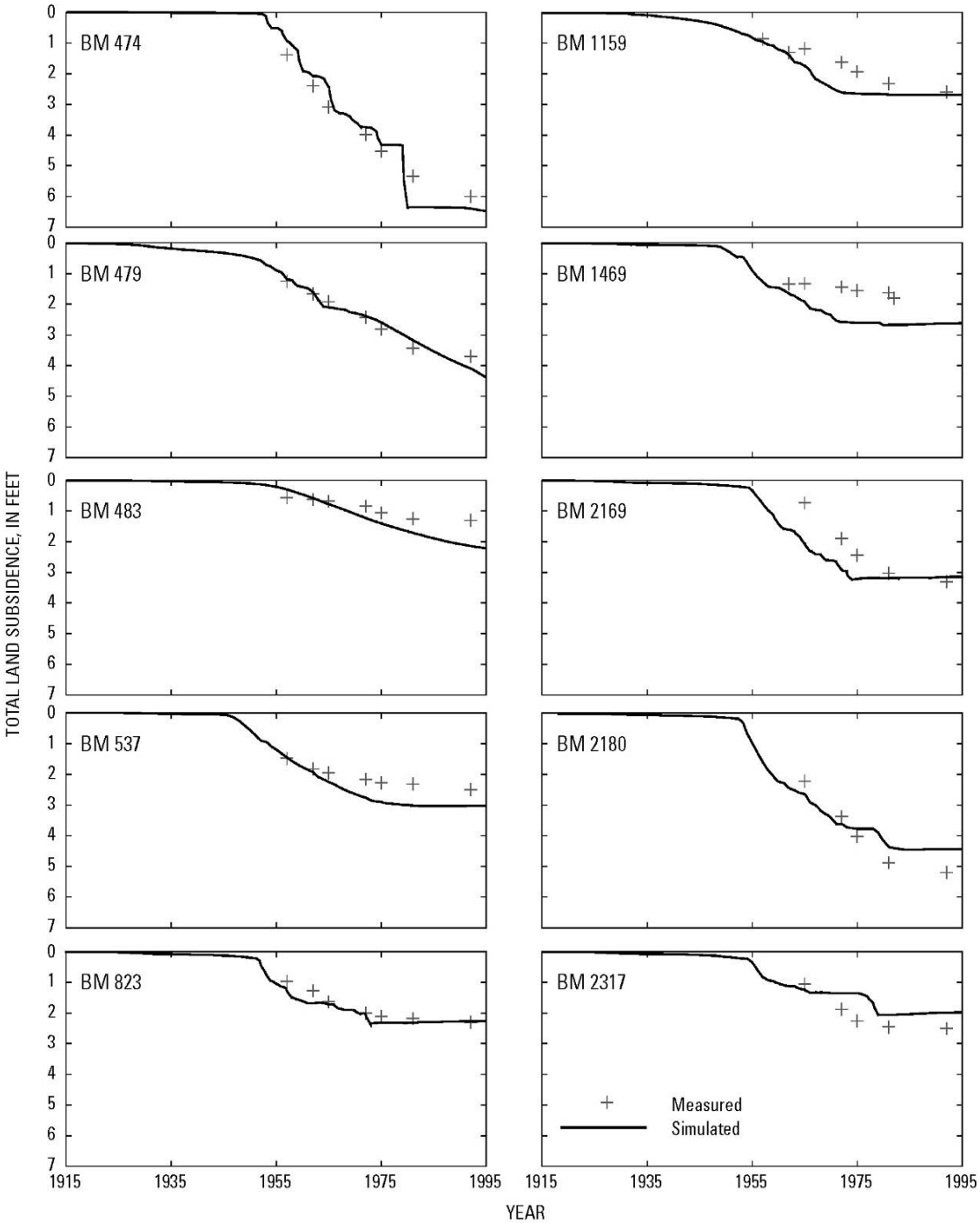

Figure 27. Measured and simulated total land subsidence at selected bench marks in the Antelope Valley ground-water basin, California, 1915–95. (See figure 15 for location of bench marks.)

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Because of the limitations of the IBS1 Package in the simulation of subsidence, a match between simulated and measured subsidence does not necessarily indicate that the parameters controlling subsidence are accurately represented by the model. The IBS1 Package simulates subsidence instantaneously after a decline in hydraulic head below the preconsolidation head; therefore, there is no time delay in the simulated subsidence to account for the delayed equilibration of hydraulic heads in the thick aquitards. Results from the one-dimensional model developed by Sneed and Galloway (2000) and from a comparison of paired water-level and subsidence data (Ikehara and Phillips, 1994) (fig. 9) indicate that the delayed drainage of the thick aquitards is an important process in the occurrence of subsidence in Antelope Valley. Therefore, the model developed for this study may simulate subsidence before it actually occurs, owing to hydrodynamic lag and residual compaction and land subsidence. Additionally, simulated subsidence is dependent on simulated drawdown. If simulated drawdown does not match actual drawdown, then simulated subsidence would not be expected to match measured subsidence.

Water Budget

The simulated annual volumes of recharge, discharge, and change in storage for Antelope Valley ground-water basin are shown in table 8. Graphs of the simulated recharge and discharge components are shown in figure 28 and a graph of simulated cumulative change in storage for the entire simulation period is shown in figure 29. Results of the transient-state simulation indicate that more than 8.5 million acre-ft of ground water was removed from storage during 1915–95, with most of the storage change occurring between about 1945 and 1975. Ground-water storage changed little during the final 10 years of simulation period because discharge by pumpage had declined sufficiently to be balanced by recharge (fig. 28*C*).

Water-budget components for the steady-state simulation and for the 1949–53 and 1991–95 periods of the transient-state simulation are shown in figure 30. The period 1949–53 was selected to represent hydrologic conditions when agricultural production and associated pumping were at a maximum. The period 1991–95 was selected to represent conditions when pumping for public supply was at a maximum and pumping for agricultural production was at a recent minimum. All components of recharge and the pumpage component of discharge were specified as model input parameters. Evapotranspiration, ground-water underflow, flow between model layers, and changes in aquifer and aquitard storage were simulated by the model.

Under steady-state conditions, recharge from natural sources was balanced by discharge as evapotranspiration and ground-water underflow from the North Muroc subbasin into Fremont Valley, and there were no changes in aquifer storage. The simulated ground-water underflow into Fremont Valley (400 acre-ft/yr) was less than half the amount estimated by Durbin (1978) (1,000 acre-ft/yr). Flow northward across the Willow Springs Fault, southeast of Rogers Lake (barrier 7, fig. 11), was equal to the ground-water underflow out of the basin. The model simulated that evapotranspiration averaged 29,900 acre-ft/yr; all of the evapotranspiration simulated by the model occurred in the area of alkali soils (fig. 4) south of barrier 7.

During the 1949–53 period, pumpage reached a maximum of 363,000 acre-ft/yr and recharge averaged 77,800 acre-ft/yr (fig. 30). Model results indicate that 79 percent of the ground-water pumpage was contributed from aquifer storage (71 percent or 265,100 acre-ft/yr) and aquitard storage (8 percent or 21,600 acre-ft/yr); of that, more than 95 percent (263,000 acre-ft/yr) came from storage in layer 1. Leakage from layer 1 into layer 2 accounted for 86 percent of the ground-water pumpage from layer 2. Recharge from irrigation-return flows was 47,500 acre-ft/yr; about 13 percent of the ground-water pumpage (fig. 30). As a result of water-level declines (fig.25), evapotranspiration was only 1,200 acre-ft/yr, about 4 percent compared to steady-state conditions.

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Table 8. Simulated recharge, discharge, and change in storage for the Antelope Valley ground-water basin, California, 1915–95

[AVEK, Antelope Valley–East Kern Water Agency; evapotranspiration and ground-water underflow are model computed values; all other values are model inputs; units in thousand acre-feet; positive numbers represent water added to the system, and negative numbers represent water removed from the system]

	Recharge				Discharge					Total		Change in storage	
	Irrigation-return flows				Pumpage			Natural					
Year	Pumpage	AVEK deliveries	Natural	Waste-water	Public supply	Agriculture	Total	Evapotran-spiration	Ground-water underflow	Recharge	Discharge	Annual	Cumulative
1915	0.0	0.0	30.3	0.0	0.0	0.0	0.0	−30.0	−0.4	30.3	−30.4	−0.1	−0.1
1916	.0	.0	30.3	.0	.0	−1.9	−1.9	−29.8	−.4	30.3	−32.1	−1.8	−1.9
1917	.0	.0	30.3	.0	.0	−5.8	−5.8	−29.5	−.4	30.3	−35.7	−5.4	−7.3
1918	.0	.0	30.3	.0	.0	−10.7	−10.7	−28.9	−.4	30.3	−40.0	−9.7	−17.0
1919	.0	.0	30.3	.0	.0	−15.5	−15.5	−28.1	−.4	30.3	−44.0	−13.7	−30.7
1920	.0	.0	30.3	.0	.0	−22.3	−22.3	−27.1	−.4	30.3	−49.8	−19.5	−50.2
1921	.0	.0	30.3	.0	.0	−29.1	−29.1	−25.8	−.4	30.3	−55.3	−25.0	−75.2
1922	.0	.0	30.3	.0	.0	−35.9	−35.9	−24.4	−.4	30.3	−60.7	−30.4	−105.6
1923	.0	.0	30.3	.0	.0	−40.7	−40.7	−23.0	−.4	30.3	−64.1	−33.8	−139.4
1924	.0	.0	30.3	.0	.0	−50.4	−50.4	−21.4	−.4	30.3	−72.2	−41.9	−181.3
1925	.0	.0	30.3	.0	.0	−64.0	−64.0	−19.7	−.4	30.3	−84.1	−53.8	−235.1
1926	.6	.0	30.3	.0	.0	−81.4	−81.4	−17.8	−.4	30.9	−99.6	−68.7	−303.8
1927	1.7	.0	30.3	.0	.0	−98.9	−98.9	−15.8	−.4	32.0	−115.1	−83.1	−386.9
1928	3.2	.0	30.3	.0	.0	−125.1	−125.1	−13.7	−.4	33.5	−139.2	−105.7	−492.6
1929	4.7	.0	30.3	.0	.0	−157.1	−157.1	−11.6	−.4	35.0	−169.1	−134.1	−626.7
1930	6.7	.0	30.3	.0	.0	−166.8	−166.8	−9.8	−.4	37.0	−177.0	−140.0	−766.7
1931	8.7	.0	30.3	.0	.0	−145.4	−145.4	−8.6	−.4	39.0	−154.4	−115.4	−882.1
1932	10.8	.0	30.3	.0	.0	−108.6	−108.6	−7.8	−.4	41.1	−116.8	−75.7	−957.8
1933	12.2	.0	30.3	.0	.0	−99.9	−99.9	−7.3	−.4	42.5	−107.6	−65.1	−1,022.9
1934	15.1	.0	30.3	.0	.0	−111.8	−111.8	−6.7	−.4	45.4	−118.9	−73.5	−1,096.4
1935	19.2	.0	30.3	.0	.0	−119.1	−119.1	−6.2	−.4	49.5	−125.7	−76.2	−1,172.6
1936	24.4	.0	30.3	.0	.0	−124.3	−124.3	−5.7	−.4	54.7	−130.4	−75.7	−1,248.3
1937	29.7	.0	30.3	.0	.0	−132.5	−132.5	−5.3	−.4	60.0	−138.2	−78.2	−1,326.5
1938	37.5	.0	30.3	.0	.0	−136.7	−136.7	−4.9	−.4	67.8	−142.0	−74.2	−1,400.7
1939	47.1	.0	30.3	.0	.0	−143.9	−143.9	−4.6	−.4	77.4	−148.9	−71.5	−1,472.2
1940	50.0	.0	30.3	.0	.0	−149.1	−149.1	−4.2	−.4	80.3	−153.7	−73.4	−1,545.6
1941	43.6	.0	30.3	.0	.0	−156.4	−156.4	−3.8	−.4	73.9	−160.6	−86.7	−1,632.3
1942	32.6	.0	30.3	.0	.0	−165.7	−165.7	−3.3	−.4	62.9	−169.4	−106.5	−1,738.8

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Table 8. Simulated recharge, discharge, and change in storage for the Antelope Valley ground-water basin, California, 1915–95—Continued

	Recharge				Discharge					Total		Change in storage	
	Irrigation-return flows				Pumpage			Natural					
Year	Pumpage	AVEK deliveries	Natural	Waste-water	Public supply	Agriculture	Total	Evapotran-spiration	Ground-water underflow	Recharge	Discharge	Annual	Cumulative
1943	30.0	.0	30.3	.0	.0	–176.0	–176.0	–2.9	–.4	60.3	–179.3	–119.0	–1,857.8
1944	33.5	.0	30.3	.0	.0	–186.4	–186.4	–2.6	–.4	63.8	–189.4	–125.6	–1,983.4
1945	35.7	.0	30.3	.0	.0	–204.0	–204.0	–2.4	–.4	66.0	–206.8	–140.8	–2,124.2
1946	37.3	0.0	30.3	0.0	0.0	–226.8	–226.8	–2.1	–0.4	67.6	–229.3	–161.7	–2,285.9
1947	39.8	.0	30.3	.0	–.6	–269.6	–270.2	–1.9	–.4	70.1	–272.5	–202.4	–2,488.3
1948	41.0	.0	30.3	.0	–.7	–330.4	–331.1	–1.7	–.4	71.3	–333.2	–261.9	–2,750.2
1949	43.2	.0	30.3	.0	–.6	–357.0	–357.6	–1.6	–.4	73.5	–359.6	–286.1	–3,036.3
1950	44.7	.0	30.3	.0	–.7	–373.0	–373.7	–1.4	–.4	75.0	–375.5	–300.5	–3,336.8
1951	46.9	.0	30.3	.0	–.8	–394.6	–395.4	–1.2	–.5	77.2	–397.1	–319.9	–3,656.7
1952	49.7	.0	30.3	.0	–6.7	–333.0	–339.7	–1.0	–.5	80.0	–341.2	–261.2	–3,917.9
1953	52.8	.0	30.3	.0	–9.2	–339.0	–348.2	–.8	–.5	83.1	–349.5	–266.4	–4,184.3
1954	55.9	.0	30.3	.0	–9.6	–313.0	–322.6	–.6	–.5	86.2	–323.7	–237.5	–4,421.8
1955	61.2	.0	30.3	.0	–7.0	–324.5	–331.5	–.5	–.5	91.5	–332.5	–241.0	–4,662.8
1956	68.0	.0	30.3	.0	–13.5	–332.2	–345.7	–.5	–.5	98.3	–346.7	–248.4	–4,911.2
1957	80.9	.0	30.3	.0	–13.9	–309.4	–323.3	–.4	–.5	111.2	–324.2	–213.0	–5,124.2
1958	99.1	.0	30.3	.0	–12.7	–293.6	–306.3	–.3	–.5	129.4	–307.1	–177.7	–5,301.9
1959	107.1	.0	30.3	.0	–15.6	–301.0	–316.6	–.3	–.5	137.4	–317.4	–180.0	–5,481.9
1960	111.9	.0	30.3	.0	–16.9	–285.5	–302.4	–.3	–.5	142.2	–303.2	–161.0	–5,642.9
1961	118.4	.0	30.3	.0	–23.3	–278.5	–301.8	–.3	–.5	148.7	–302.6	–153.9	–5,796.8
1962	100.0	.0	30.3	.0	–28.5	–284.4	–312.9	–.2	–.5	130.3	–313.6	–183.3	–5,980.1
1963	101.7	.0	30.3	.0	–22.5	–317.5	–340.0	–.2	–.5	132.0	–340.7	–208.7	–6,188.8
1964	93.9	.0	30.3	.0	–24.7	–332.5	–357.2	–.2	–.5	124.2	–357.9	–233.7	–6,422.5
1965	97.4	.0	30.3	.0	–26.5	–331.3	–357.8	–.2	–.4	127.7	–358.4	–230.7	–6,653.2
1966	99.7	.0	30.3	.0	–29.1	–316.3	–345.4	–.1	–.4	130.0	–345.9	–215.9	–6,869.1
1967	92.8	.0	30.3	.0	–26.0	–297.8	–323.8	–.1	–.4	123.1	–324.3	–201.2	–7,070.3
1968	88.1	.0	30.3	.0	–28.6	–279.0	–307.6	–.1	–.4	118.4	–308.1	–189.7	–7,259.9
1969	90.3	.0	30.3	.0	–35.7	–258.3	–294.0	–.1	–.4	120.6	–294.5	–173.9	–7,433.8
1970	85.6	.0	30.3	.0	–30.1	–240.0	–270.1	–.1	–.4	115.9	–270.6	–154.7	–7,588.5
1971	83.5	.0	30.3	.0	–32.3	–217.1	–249.4	–.1	–.3	113.8	–249.8	–136.0	–7,724.6

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Table 8. Simulated recharge, discharge, and change in storage for the Antelope Valley ground-water basin, California, 1915–95—Continued

	Recharge				Discharge					Total		Change in storage	
	Irrigation-return flows				Pumpage			Natural					
Year	Pumpage	AVEK deliveries	Natural	Waste-water	Public supply	Agriculture	Total	Evapotran-spiration	Ground-water underflow	Recharge	Discharge	Annual	Cumulative
1972	85.3	.0	30.3	.0	–32.4	–192.2	–224.6	–.1	–.3	115.6	–225.0	–109.4	–7,834.0
1973	95.3	.0	30.3	.0	–33.8	–178.6	–212.4	.0	–.3	125.6	–212.7	–87.1	–7,921.1
1974	100.8	.0	30.3	.0	–32.2	–164.9	–197.1	.0	–.3	131.1	–197.4	–66.3	–7,987.4
1975	99.4	.0	30.3	.0	–30.3	–161.1	–191.4	.0	–.3	129.7	–191.7	–62.0	–8,049.4
1976	94.9	.0	30.3	.0	–31.7	–138.0	–169.7	.0	–.3	125.2	–170.0	–44.8	–8,094.2
1977	89.3	.0	30.3	.0	–29.0	–166.3	–195.3	.0	–.3	119.6	–195.6	–76.0	–8,170.2
1978	83.7	.0	30.3	.0	–36.4	–155.8	–192.2	.0	–.3	114.0	–192.5	–78.5	–8,248.7
1979	77.5	0.0	30.3	0.0	–26.0	–135.3	–161.3	0.0	–0.3	107.8	–161.6	–53.8	–8,302.4
1980	72.0	.0	30.3	.0	–26.1	–128.4	–154.5	.0	–.3	102.3	–154.8	–52.5	–8,354.9
1981	65.1	.0	30.3	.0	–26.9	–93.9	–120.8	.0	–.3	95.4	–121.1	–25.7	–8,380.6
1982	57.7	.0	30.3	.0	–25.4	–86.1	–111.5	.0	–.3	88.0	–111.8	–23.8	–8,404.4
1983	53.6	.0	30.3	.0	–20.9	–91.7	–112.6	.0	–.3	83.9	–112.9	–29.0	–8,433.4
1984	49.5	.0	30.3	.5	–27.0	–80.9	–107.9	.0	–.2	80.3	–108.1	–27.8	–8,461.1
1985	48.3	.0	30.3	1.4	–26.5	–64.3	–90.8	.0	–.2	80.0	–91.0	–11.0	–8,472.1
1986	41.4	7.9	30.3	2.0	–31.5	–55.1	–86.6	.0	–.2	81.6	–86.8	–5.2	–8,477.3
1987	44.4	9.1	30.3	2.9	–33.0	–60.6	–93.6	.0	–.2	86.7	–93.8	–7.1	–8,484.4
1988	39.8	10.2	30.3	3.2	–23.1	–47.8	–70.9	.0	–.2	83.5	–71.1	12.4	–8,472.0
1989	35.8	13.5	30.3	3.4	–39.1	–33.7	–72.8	.0	–.2	82.9	–73.0	9.9	–8,462.0
1990	34.8	14.8	30.3	4.9	–36.2	–34.5	–70.7	.0	–.2	84.8	–70.9	13.9	–8,448.2
1991	26.0	16.2	30.3	4.5	–56.5	–47.6	–104.1	.0	–.2	77.0	–104.3	–27.3	–8,475.5
1992	24.4	9.8	30.3	5.6	–38.3	–42.7	–81.0	.0	–.2	70.1	–81.2	–11.1	–8,486.6
1993	25.7	5.1	30.3	6.5	–33.4	–39.7	–73.1	.0	–.2	67.6	–73.3	–5.7	–8,492.3
1994	22.7	4.4	30.3	6.9	–40.2	–35.6	–75.8	.0	–.2	64.3	–76.0	–11.7	–8,504.0
1995	18.7	5.0	30.3	7.5	–40.4	–34.1	–74.5	.0	–.2	61.5	–74.7	–13.2	–8,517.1

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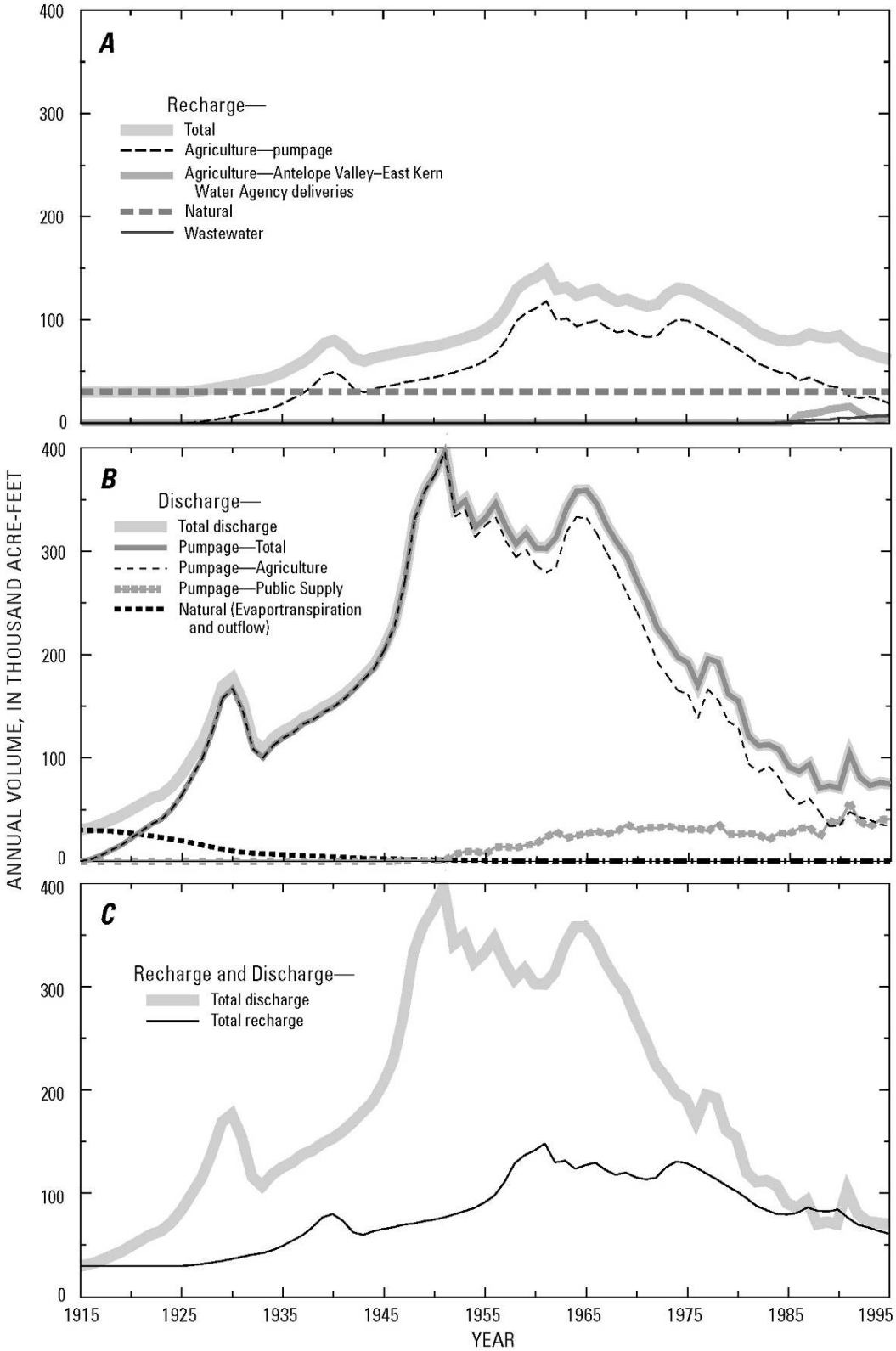

Figure 28. Simulated annual volumes of ***(A)*** recharge, ***(B)*** discharge, and ***(C)*** recharge in relation to discharge in the Antelope Valley ground-water basin, California, 1915–95.

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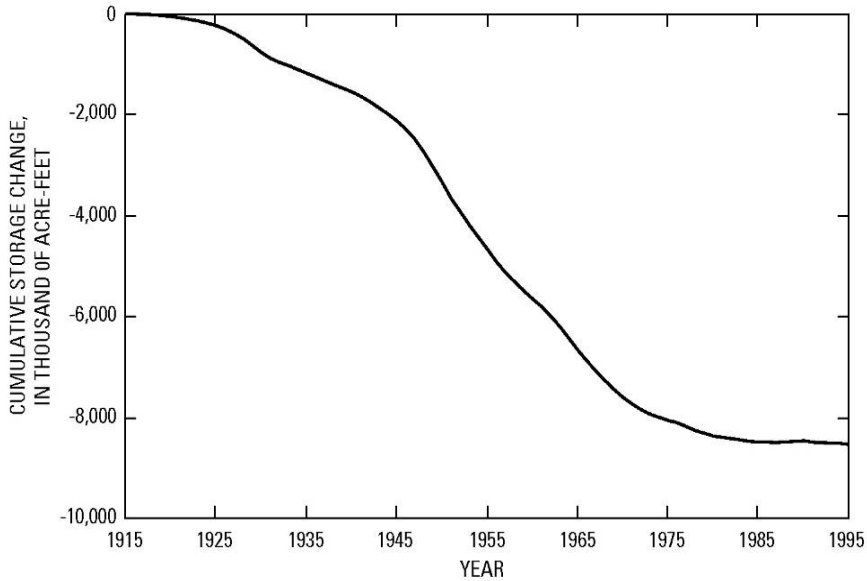

Figure 29. Cumulative change in simulated ground-water storage in the Antelope Valley ground-water basin, California, 1915–95.

During the1991–95 period, pumpage averaged 81,700 acre-ft/yr, which is only 23 percent of the pumpage during the 1949–53 period and total recharge averaged 68,100 acre-ft/yr, which is about 86 percent of the total recharge during the 1949-53 period. Model results indicate that about 13,700 acre-ft/yr of ground water was being removed from aquifer and aquitard storage, which is about 17 percent of the total pumpage. Compaction of the aquitards accounted for 3,800 acre-ft/yr of water being removed from storage, which is 28 percent of the change in storage. Similar to the1949–53 period, the source of nearly all the ground-water pumpage from layer 2 was leakage from layer 1. Continued water-level declines (fig. 25), resulted in the cessation of simulated evapotranspiration and a 50-percent reduction of ground-water underflow from the North Muroc subbasin compared to steady-state conditions.

Model Sensitivity Analysis

A sensitivity analysis was done to determine the sensitivity of the model to changes in model input parameters. Sensitivity analysis can help determine which model parameters have the greatest effect on a model; results of the analysis can guide future data collection efforts that will reduce model errors. The sensitivity simulations were done by changing one input parameter at a time, while holding all others constant. A limitation of this approach is that the effects of simultaneous changes of multiple input parameters are not evaluated. The sensitivity of the model was evaluated by comparing water levels and subsidence from the sensitivity simulations with those from the calibrated transient-state model at the end of the transient period (1995). Sensitivity simulations also were done for the steady-state model; results generally were similar to the results of the transient-state model and therefore are not discussed here.

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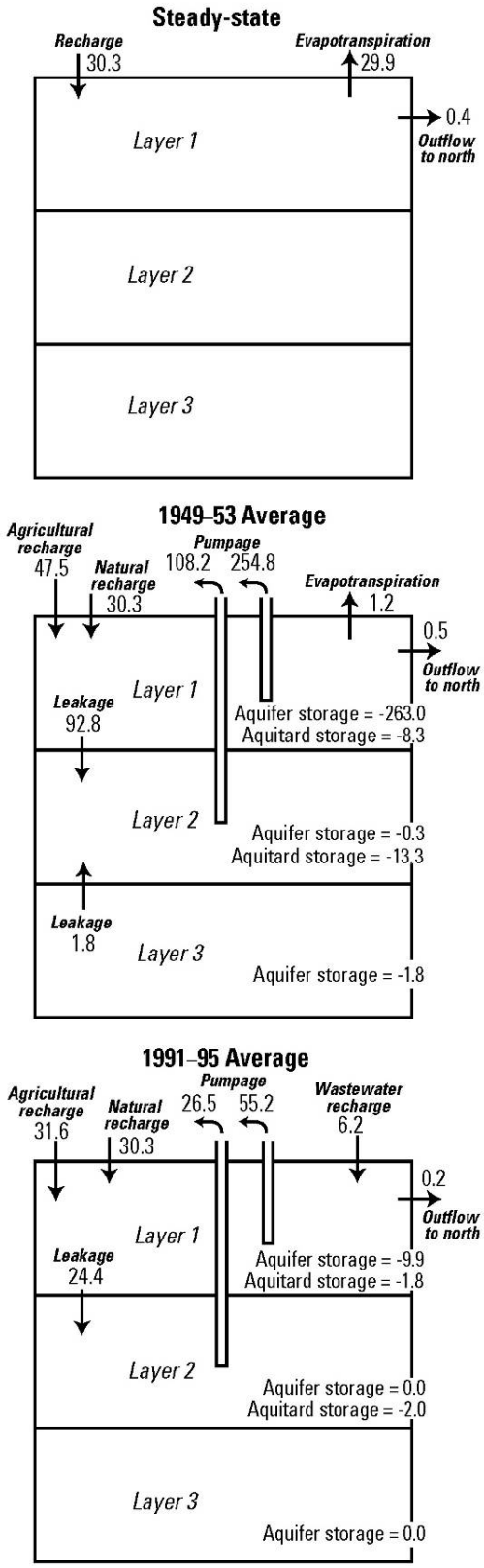

Figure 30. Components of the simulated water budget for selected periods from the ground-water flow model of the Antelope Valley ground-water basin, California. (Units are in thousand acre-feet.)

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Model sensitivity was determined for variations in hydraulic conductivity (layer 1), transmissivity (layers 2 and 3), confined and unconfined storage coefficients, vertical leakance, pumpage, recharge, and the hydraulic-characteristic values of the flow barriers. The magnitude of these variations was somewhat subjective, but based loosely on the range of reasonable values for each parameter and on the sensitivity observed during the calibration process. Hydraulic conductivity, transmissivity, and specific yield were varied from 0.5 to 2 times calibrated values. Vertical leakance and confined storage coefficients were varied from 0.1 to 10 times calibrated values. Total pumpage, agricultural pumpage, and recharge were increased and decreased by 10 percent. The sensitivity of the model to the effects of the flow barriers was analyzed by removing the barriers (no restriction to flow) and reducing the hydraulic-characteristic values of the barriers to one-half the calibrated values (increased restriction to flow). Sensitivity-analysis results were aggregated into four subareas because the simulated water levels within each subarea showed a similar response to changes in the input parameters. These subareas are (1) the western subarea (the Finger Buttes, Neenach, and West Antelope subbasins); (2) the southeastern subarea (the Buttes and Pearland subbasins); (3) the northern subarea [the North Muroc subbasin and the part of the Lancaster subbasin north of barrier 7 (figure 11)]; and (4) the central subarea (the remainder of the Lancaster subbasin south of barrier 7).

Water-level changes resulting from the sensitivity analysis are shown in table 9. Simulated water levels were most sensitive to changes in the hydraulic characteristic of the flow barrier. The largest water-level changes resulting from changes in the hydraulic characteristic of the flow barriers occurred in the western and southeastern subareas. Water levels in the northern and central subareas were relatively insensitive to changes in the hydraulic characteristics of the flow barriers compared with water levels in the western and southeastern subareas. The western and southern subareas also were sensitive to changes in hydraulic conductivity, transmissivity of layer 2, specific yield, and natural recharge.

Water levels in the northern and central subareas were most sensitive to changes in hydraulic conductivity, specific yield, inelastic skeletal storage coefficient, and vertical leakance between layers 1 and 2. These subareas also were sensitive to the changes in total pumpage and agricultural pumpage. The insensitivity of the model to changes in transmissivity of layer 3 indicates that defining the base of the model at an altitude of 1,000 ft above sea level was reasonable.

The sensitivity of simulated land subsidence at the end of the transient period (1995) to selected model input parameters is shown in table 10. All the bench marks used for the subsidence analysis are located in the Lancaster subbasin (fig. 15), and, therefore, the results of the subsidence sensitivity analysis are for this subbasin only. Pumping-induced subsidence is controlled by the inelastic skeletal storage coefficient and the water-level drawdown below the preconsolidation head. Simulated subsidence, therefore, was most sensitive to the changes in inelastic skeletal storage and specific yield.

In summary, the results of the sensitivity analysis indicate that the model is sensitive to different parameters in different areas. In the northern and central subareas, the model is most sensitive to changes in hydraulic conductivity of layer 1, specific yield, inelastic skeletal storage coefficient, vertical leakance between layers 1 and 2, and pumpage. In the western and southeastern subbasins, the model is most sensitive to changes in hydraulic conductivity of layer 1, transmissivity of layer 2, specific yield, natural recharge, and the hydraulic-characteristic values. Because changes in one model parameter may be offset by changes in another, improving the understanding of one parameter may aid in decreasing the uncertainty of other parameters.

Limitations of the Model

A ground-water flow model is a valuable tool for testing the conceptualization of the ground-water flow system and for predicting the response of the system to changes in aquifer stresses. However, a model is only an approximation of the actual aquifer system and, therefore, will not exactly simulate the system being modeled. The model relies on estimates of aquifer properties and stresses, which have some degree of uncertainty, and it lacks the small-scale spatial and temporal variability present in the actual system.

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Table 9. Change in simulated water levels at the end of the transient period (1995) resulting from the sensitivity analysis of the ground-water flow model of the Antelope Valley ground-water basin, California

[Subarea: Western (Finger Buttes, Neenach, and West Antelope subbasins); Southeastern (Buttes and Pearland subbasins); Northern (North Muroc and the part of the Lancaster subbasin north of barrier 7); Central (the part of the Lancaster subbasin south of barrier 7). Order of presentation: from most sensitive (highest median water-level change) to least sensitive (lowest median water-level change)]

Change in parameter or stress	Layer	Water-level change, in feet											
		Western subarea			Southeastern subarea			Northern subarea			Central subarea		
		Range	Mean	Median	Range	Mean	Median	Range	Mean	Median	Range	Mean	Median
Flow barriers not simulated	1	−611/12	−192	−198	−125/73	−44	−48	−25/15	6	11	−52/29	−2	0
	2	−626/16	−172	−52				−26/18	7	12	−36/27	−2	0
	3	−628/14	−160	−34				−24/20	7	12	−36/25	−2	−1
Hydraulic characteristics of flow barriers × 0.5	1	2/278	118	128	−62/172	50	38	−12/4	−6	1	−6/52	1	0
	2	4/273	98	14				−12/2	−6	−7	−5/17	1	0
	3	4/273	94	11				−12/2	−7	−11	−5/14	1	0
Hydraulic conductivity of layer 1 × 0.5	1	12/245	104	105	27/340	162	130	−11/12	5	6	−29/126	14	6
	2	14/142	91	102				−3/9	4	6	−15/113	11	5
	3	14/138	89	101				−3/9	3	2	−11/112	11	5
Specific yield of layer 1 × 0.5	1	−26/−116	−76	−68	−119/89	−19	−19	−81/0	−25	−26	−184/131	−108	−110
	2	−36/−113	−82	−84				−86/−22	−25	−26	−177/0	−115	−110
	3	−36/−111	−83	−98				−88/−22	−26	−26	−164/−62	−115	−111
Hydraulic conductivity of layer 1 × 2	1	−177/−9	−82	−87	−186/−8	−105	−94	−12/11	−6	−8	−106/14	−19	−14
	2	−108/−11	−74	−72				−10/0	−6	−8	−101/3	−18	−13
	3	−106/−11	−72	−84				−9/0	−5	−4	−100/2	−17	−12
Specific yield of layer 1 × 2	1	5/75	46	40	2/102	25	22	0/52	17	18	6/166	72	74
	2	10/75	51	51				12/54	17	18	0/145	75	74
	3	12/75	53	62				14/56	17	16	29/138	74	73
Natural recharge × 0.9	1	−56/−8	−34	−40	−36/0	−22	−23	−2/1	0	0	−24/0	−8	−7
	2	−51/−9	−31	−34				−3/1	0	0	−23/0	−8	−7
	3	−50/−9	−31	−29				−3/1	0	0	−23/−2	−8	−7

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Table 9. Changes in simulated water levels at the end of the transient period (1995) resulting from the sensitivity analysis of the ground-water flow model of the Antelope Valley ground-water basin, California—Continued

Change in parameter or stress	Layer	Water-level change, in feet											
		Western subarea			Southeastern subarea			Northern subarea			Central subarea		
		Range	Mean	Median	Range	Mean	Median	Range	Mean	Median	Range	Mean	Median
Natural recharge × 1.1	1	9/54	34	40	0/35	21	21	0/2	0	0	−26/23	6	6
	2	9/49	31	34				0/2	0	0	−19/23	6	6
	3	9/48	30	29				0/2	0	0	−1/22	7	6
Inelastic skeletal storage coefficient of layer 2 × 10	1	0/27	4	1	0/32	2	0	0/59	12	7	0/63	36	28
	2	0/26	5	1				0/65	16	8	0/89	41	42
	3	0/26	6	2				0/62	20	25	0/69	42	44
Inelastic skeletal storage coefficient of layer 1 × 10	1	0/27	4	1	−1/23	1	0	0/56	12	6	0/56	31	32
	2	0/26	5	1				0/50	13	7	0/51	32	33
	3	0/26	5	1				0/49	17	21	2/49	33	34
Transmissivity of layer 2 × 2	1	−59/−1	−29	−30	−24/0	−3	−2	−14/3	0	0	−55/17	−8	−6
	2	−64/3	−30	−30				−14/7	0	0	−61/33	−9	−8
	3	−63/2	−29	−29				−5/4	1	1	−59/24	−8	−7
Transmissivity of layer 2 × 0.5	1	0/39	21	21	0/15	3	2	−3/14	1	0	−26/37	5	3
	2	−1/41	21	21				−9/16	0	0	−42/43	5	4
	3	−1/41	21	21				−5/6	0	0	−33/41	5	3
Vertical leakance between layers 1 and 2 × 0.1	1	3/27	13	15	0/11	2	2	−2/15	2	2	−5/40	9	7
	2	−36/26	4	7				−20/−1	−10	−7	−64/13	−10	−7
	3	−34/25	4	7				−19/−4	−11	−14	−60/8	−10	−7
Transmissivity of layer 3 × 2	1	−28/0	−12	−11	−3/0	−1	−1	−4/1	0	0	−22/4	−2	−2
	2	−30/1	−12	−11				−6/1	0	0	−23/4	−3	−2
	3	−36/3	−12	−11				−6/2	0	0	−28/17	−3	−2

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Table 9. Changes in simulated water levels at the end of the transient period (1995) resulting from the sensitivity analysis of the ground-water flow model of the Antelope Valley ground-water basin, California—Continued

Change in parameter or stress	Layer	Water-level change, in feet											
		Western subarea			Southeastern subarea			Northern subarea			Central subarea		
		Range	Mean	Median	Range	Mean	Median	Range	Mean	Median	Range	Mean	Median
Inelastic skeletal storage coefficient of layer 2 × 0.1	1	–5/0	–1	0	–7/0	0	0	–16/0	–5	–3	–15/0	–8	–8
	2	–4/0	–1	0				–16/0	–6	–3	–15/0	–9	–9
	3	–4/0	–1	0				–15/0	–7	–10	–15/0	–9	–9
Pumpage increased by 10 percent	1	–7/0	–4	–4	–9/0	–2	–1	–8/0	–4	–3	–48/0	–8	–8
	2	–7/0	–4	–5				–7/–2	–4	–4	–39/0	–9	–8
	3	–8/0	–4	–5				–8/–2	–5	–5	–35/0	–9	–9
Agricultural pumpage decreased by 10 percent	1	0/7	3	4	0/3	1	1	0/3	0	0	–10/11	5	6
	2	0/7	4	4				0/3	0	0	–7/10	5	6
	3	0/7	4	5				0/3	0	0	–2/9	6	6
Pumpage decreased by 10 percent	1	0/7	4	4	0/5	2	1	0/8	4	3	–8/40	7	7
	2	0/7	4	5				2/8	4	4	–6/36	7	7
	3	0/8	4	5				2/7	5	5	–1/32	8	8
Transmissivity of layer 3 × 0.5	1	0/16	7	7	0/2	1	1	0/5	0	0	–3/13	2	1
	2	0/17	7	7				–1/6	0	0	–5/14	2	1
	3	–3/20	7	7				–2/7	0	0	–11/16	2	1
Agricultural pumpage increased by 10 percent	1	–7/0	–4	–4	–7/0	–1	–1	–3/0	0	0	–12/0	–6	–7
	2	–7/0	–4	–5				–5/0	0	0	–11/0	–7	–7
	3	–7/0	–4	–5				–4/0	0	0	–9/–3	–7	–7
Storage coefficient of layer 3 × 10	1	0/9	6	6	–2/2	0	0	0/6	2	2	–13/13	5	7
	2	1/9	6	7				1/5	3	3	–10/13	6	7
	3	0/10	6	7				2/6	3	4	–6/17	6	6
Inelastic skeletal storage coefficient of layer 1 × 0.1	1	–4/0	–1	0	–4/1	0	0	–23/1	–4	–2	–18/0	–6	–6
	2	–4/0	–1	0				–18/1	–4	2	–12/0	–6	–6
	3	–4/0	–1	0				–13/1	–5	–7	–11/0	–6	–6

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Table 9. Changes in simulated water levels at the end of the transient period (1995) resulting from the sensitivity analysis of the ground-water flow model of the Antelope Valley ground-water basin, California—Continued

Change in parameter or stress	Layer	Water-level change, in feet											
		Western subarea			Southeastern subarea			Northern subarea			Central subarea		
		Range	Mean	Median	Range	Mean	Median	Range	Mean	Median	Range	Mean	Median
Vertical leakance between layers 1 and 2 × 10	1	−12/−1	−6	−4	−7/0	−1	0	−3/3	0	0	−21/4	−3	−2
	2	−18/11	−4	−3				−1/6	2	1	−18/15	−1	0
	3	−17/5	−4	−3				−1/5	2	2	−13/13	−1	0
Vertical leakance between layers 2 and 3 × 0.1	1	−1/7	2	2	0/1	1	1	−2/13	−1	−1	−12/19	1	0
	2	−1/7	2	2				−2/15	0	−1	−12/21	1	0
	3	−37/9	−1	1				−6/6	0	−1	−35/74	3	4
Elastic storage coefficient of layer 1 × 10	1	−4/5	2	2	−2/2	1	1	0/3	1	2	−17/4	0	1
	2	−4/5	2	2				0/3	1	2	−15/4	0	1
	3	−4/5	2	2				0/2	1	2	−8/3	1	1
Elastic storage coefficient of layer 2 × 10	1	−2/2	1	1	−3/1	0	0	0/3	2	2	−18/2	0	1
	2	−3/2	1	1				−1/3	2	2	−16/2	−1	0
	3	−3/2	1	1				−1/3	2	2	−10/2	0	0
Vertical leakance between layers 2 and 3 × 10	1	−2/1	−1	−1	−1/0	0	0	−7/1	0	0	−13/5	0	0
	2	−3/1	−1	−1				−9/1	0	0	−13/10	−1	0
	3	−6/5	0	0				−7/1	0	0	−19/9	−1	0
Storage coefficient representing the compressibility of water for layer 2 × 10	1	0/2	1	1	−4/1	0	0	0/2	0	0	−18/3	1	1
	2	0/2	1	1				0/2	1	1	−15/3	1	1
	3	0/2	1	1				0/2	1	1	−9/2	1	1
Storage coefficient of layer 3 × 0.1	1	−1/0	−1	−1	−1/1	0	0	−1/0	−1	0	−1/0	−1	−1
	2	−1/0	−1	−1				−1/0	−1	0	−1/0	−1	−1
	3	−1/0	−1	−1				−2/0	−1	0	−2/0	−1	−1

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Table 9. Changes in simulated water levels at the end of the transient period (1995) resulting from the sensitivity analysis of the ground-water flow model of the Antelope Valley ground-water basin, California—Continued

Change in parameter or stress	Layer	Water-level change, in feet											
		Western subarea			Southeastern subarea			Northern subarea			Central subarea		
		Range	Mean	Median	Range	Mean	Median	Range	Mean	Median	Range	Mean	Median
Wastewater recharge × 0.5	1	0	0	0	−3/0	0	0	0/1	0	0	−28/1	−1	0
	2	0	0	0				0/1	0	0	−23/0	−1	0
	3	0	0	0				0/1	0	0	−7/0	−1	0
Wastewater recharge × 2	1	0	0	0	0/6	0	0	0/1	0	0	0/51	1	0
	2	0	0	0				0/1	0	0	0/43	1	0
	3	0	0	0				0/1	0	0	0/14	1	0
Storage coefficient representing the compressibility of water for layer 1 × 0.1	1	0	0	0	0	0	0	−1/0	0	0	0	0	0
	2	0	0	0				−1/0	0	0	−1/0	0	0
	3	0	0	0				−1/0	0	0	0	0	0
Storage coefficient representing the compressibility of water for layer 1 × 10	1	0	0	0	0	0	0	0/1	0	0	0/1	0	0
	2	0	0	0				0/1	0	0	0/1	0	0
	3	0/1	0	0				0/1	0	0	0/1	0	0
Storage coefficient representing the compressibility of water for layer 2 × 0.1	1	−1/0	0	0	−1/0	0	0	−1/0	0	0	−1/0	0	0
	2	−1/0	0	0				−1/0	0	0	−1/0	0	0
	3	−1/0	0	0				−1/0	0	0	−1/0	0	0
Elastic skeletal storage coefficient of layer 1 × 0.1	1	−1/1	0	0	−1/0	0	0	−1/0	0	0	−1/0	0	0
	2	−1/1	0	0				−1/0	0	0	−1/0	0	0
	3	−1/1	0	0				−1/0	0	0	−1/0	0	0
Elastic skeletal storage coefficient of layer 2 × 0.1	1	−1/1	0	0	−1/0	0	0	−1/0	0	0	−1/1	0	0
	2	−1/0	0	0				−1/0	0	0	−1/1	0	0
	3	−1/1	0	0				−1/0	0	0	−1/0	0	0

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Table 10. Change in simulated land subsidence at the end of the transient period (1995) resulting from changes in selected model input parameters and stresses during the sensitivity analysis of the ground-water flow model of the Antelope Valley ground-water basin, California

[Order of presentation: from most sensitive (highest median subsidence change) to least sensitive (lowest median subsidence change)]

Change in parameter or stress	Change in simulated subsidence, in feet		
	Range	Mean	Median
Layer 2 inelastic skeletal storage coefficient × 10	1.65/14.20	6.08	5.94
Layer 1 inelastic skeletal storage coefficient × 10	2.81/8.47	5.25	5.24
Layer 1 specific yield × 0.5	1.90/7.98	4.08	3.40
Layer 1 specific yield × 2	−3.99/−1.37	−2.29	−1.93
Layer 2 inelastic skeletal storage coefficient × 0.1	−4.03/−.61	−1.54	−1.39
Layer 1 inelastic skeletal storage coefficient × 0.1	.21/1.53	1.53	.42
Pumpage increased by 10 percent	−.01/.95	.38	.29
Agricultural pumpage increased by 10 percent	−.01/.73	.31	.28
Layer 1 elastic skeletal storage coefficient × 10	−.09/.73	.31	.23
Layer 2 elastic skeletal storage coefficient × 10	−.06/.65	.28	.23
Layer 3 storage coefficient × 10	−.41/−.15	−.25	−.20
Pumpage decreased by 10 percent	−.49/−.09	−.21	−.20
Natural recharge × 1.1	−.41/−.05	−.18	−.17
Natural recharge × 0.9	.04/.46	.18	.16
Agricultural pumpage decreased by 10 percent	−.24/−.04	−.14	−.15
Hydraulic conductivity of layer 1 × 2	−.32/1.05	.33	.14
Vertical leakance between layers 1 and 2 × 0.1	−.26/.42	.08	.06
Hydraulic conductivity of layer 1 × 0.5	−.56/.38	−.08	−.06
Vertical leakance between layers 1 and 2 × 10	−.72/.12	−.12	−.05
Transmissivity of layer 3 × 2	−.07/.29	.06	.04
Layer 2 storage coefficient representing the compressibility of water ×10	−.09/−.03	.05	.04
Vertical leakance between layers 2 and 3 × 0.1	−.54/.12	−.07	.03
Layer 1 elastic skeletal storage coefficient × 0.1	−.07/.0	−.03	−.02
Transmissivity of layer 2 × 2	−.33/.62	.05	−.02
Layer 2 elastic skeletal storage coefficient × 0.1	−.06/.0	−.03	−.02
Layer 3 storage coefficient × 0.1	.01/.05	.03	.02
Vertical leakance between layers 2 and 3 × 10	−.29/.19	−.01	−.02
Transmissivity of layer 2 × 0.5	−.57/.54	−.01	.02
Layer 2 storage coefficient representing the compressibility of water × 0.1	−.01/.0	−.01	−.01
Hydraulic characteristics of low barriers × 0.5	−.04/.09	.00	.01
Wastewater recharge × 0.5	.0/.01	.00	.00
Wastewater recharge × 2	−.01/.0	.00	.00
Flow barriers not simulated	−.34/.53	.04	.00
Transmissivity of layer 3 × 0.5	−.30/.04	−.05	.00
Layer 1 storage coefficient representing the compressibility of water × 0.1	−.03/.08	.00	.00
Layer 1 storage coefficient representing the compressibility of water × 10	.0/.01	.00	.00

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Water levels and land subsidence calculated by the model are average values for the area represented by each model cell. Simulated water levels can vary considerably from measured water levels because of well location, depth, and construction. For example, wells may be screened over a depth represented by more than one model layer, whereas, measured water levels may be a composite of the actual water levels in each layer. The size of the model cell and the length of the stress period of the model are appropriate for the resolution of available data and for simulations on a regional scale. Because model uncertainty increases significantly with the decreasing size of the area of interest, the model generally should not be used to address local-scale problems.

Little is known about the geohydrology of the Finger Buttes, West Antelope, Neenach, Pearland, and Buttes subbasins. Consequently, hydraulic properties specified in the model for these subbasins were based on limited data. Available data indicate that hydraulic conductivity of the aquifer material is lower in the upslope areas adjacent to the mountain fronts than in the downslope areas, which is contrary to what would be expected for areas with typical alluvial fan development, where coarse-grained material is deposited at the fan heads (higher hydraulic conductivity) and fine-grained material is deposited at the fan margins (lower conductivity). In these five subbasins, which have depths to water greater than the other subbasins, the water table may be below the more transmissive coarse-grained material. Tectonic processes, such as uplift and erosion, also may affect the hydrologic properties of the aquifers. The water-level data for these subbasins used to calibrate the model also were limited; consequently, the differences between the simulated and the measured water levels were greatest in these subbasins. Although the simulated water levels for Finger Buttes, West Antelope, Neenach, Pearland, and Buttes subbasins provide reasonable boundary conditions for simulating the water levels in the Lancaster subbasin for the calibration period, the high degree of uncertainty in the model input for these subbasins greatly reduces the potential for accurate predictions of ground-water conditions in these subbasins. Additional geohydrologic data would improve the accuracy of the model for these subbasins.

The model is sensitive to the location and simulated barrier effect of faults. It is likely that there are additional concealed faults crossing the study area that have not yet been identified in areas that are not currently being stressed. The barrier effect of these faults may become apparent in the future, if pumping or recharge occurs near unknown faults. If these faults significantly affect ground-water flow, the faults should be added to the model.

The quantity and distribution of agricultural pumpage is uncertain. As shown in the sensitivity analysis, the variability in estimates of pumpage can significantly affect model results. More accurate estimates of agricultural pumpage would improve the model results. Results from simulations of future conditions that include pumpage for areas where pumping had not previously occurred should be interpreted carefully because the stresses from pumping were not simulated during the calibration process of the model.

Natural and agricultural recharge are difficult to measure and, therefore, the recharge rates and temporal distribution of recharge were based on the model calibration results. The calibration process resulted in a lower rate of natural recharge than had been estimated for previous studies. Additional geohydrologic data are needed to confirm that the natural recharge rates used in the model are accurate; however, collection of additional data was beyond the scope of this study. The travel time for irrigation-return flows to reach the water table was simulated as a constant (10 years) for the entire model area. Model results probably could be improved by more accurately specifying the travel time for each area on the basis of the depth-to-water and aquifer material.

The approach taken in this study to simulate aquifer-system compaction in unconfined portions of the model layer 1 using the IBS1 package will tend to overestimate compaction in that layer, where the water table declines, and underlying mode layers. IBS1 does not account for changes in the total stress that occur when the water table rises and lowers, as it may in model layer 1. Changes in the position of the water table cause changes in the total stress exerted on the underlying sediment owing to the overlying weight of water that changes when the water table fluctuates. These effects are relatively small and the overestimated subsidence in the model simulation is expected to be in the range of 1.18 to 1.33 percent, and is primarily dependent upon the porosity of the sediments in model layer 1 in the zone of water-table fluctuation.

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Although the model does a relatively good job of simulating the measured quantity of land subsidence, the IBS1 Package used to simulate aquifer compaction does not accurately simulate the delayed drainage in the thick aquitards or the timing of subsidence in areas where thick aquitards are a major contributor to subsidence. ISB1 simulates the instantaneous release of water from storage from fine-grained, compressible interbeds for a head decline in the surrounding aquifer. As such, the heads in the interbeds are assumed to equilibrate instantaneously with head changes in the aquifers. This treatment ignores the delayed equilibration of head associated with the low permeability interbeds and aquitards which is further exacerbated by their thickness—the time constants governing head equilibration in these units is proportional to their squared thickness. Additionally, the model does not simulate subsidence throughout the modeled area because values of inelastic storage only were specified in areas where subsidence previously had been measured. In areas where inelastic skeletal storage was not specified, future water-level declines below preconsolidation heads could cause subsidence where compressible sediments exist in these areas. Subsidence cannot be simulated for these areas unless inelastic skeletal storage coefficients and preconsolidation heads are specified for these areas.

Owing to uncertainty in some parameters used in the model, especially in the agricultural component of pumpage, model results from the predictive simulation should be used with caution. The model, like most models, is not ideally suited for predicting absolute changes in water levels or subsidence. The most appropriate application of the model is comparing the relative effects of different water-management scenarios on the aquifer system.

Simulation of Aquifer-System Response to Pumping Scenarios

A calibrated flow model can be used as a tool to evaluate and compare the responses of an aquifer system to potential future stresses. Management actions involving changes in the quantity and distribution of pumpage or recharge can be simulated and the aquifer-system responses compared to evaluate the effectiveness of these actions satisfying management goals. Although water levels and subsidence simulated for a given scenario may not accurately represent the values in the real system, the relative differences in water levels and subsidence over time can be compared to provide managers with useful information for planning and decision making.

For this study, the model was used to simulate the aquifer-system response to two potential pumping scenarios for 1995–2025. For both scenarios, all model parameters were unchanged from those specified in the transient-state simulation. Natural recharge and artificial recharge from irrigation-return flows and from reclaimed wastewater were specified equal to the quantities specified for those sources for 1995. For both scenarios, recharge from irrigation-return flows was calculated as 30 percent of the water used for irrigation and was assumed to recharge the water table 10 years after the irrigation water was applied. For scenario 1, total annual pumpage for 1995–2025 was specified equal to total annual pumpage in 1995. For scenario 2, public-supply pumpage was increased 3.3 percent annually and agricultural pumpage was assumed to be 75 percent greater than agricultural pumpage in 1995 for the simulated period 1995–2025. Recharge from irrigation-return flows was correspondingly increased by 75 percent. The annual increase in public-supply pumpage was based on population growth projections for Palmdale and Lancaster from the Southern California Association of Governments (2001). The increase in agricultural pumpage was based on crop-acreage data from the Los Angeles County Agricultural Commissioner which indicated that agricultural production in the study area increased as much as 75 percent during 1995–98. The spatial distribution of pumpage for both scenarios was the same as was specified for 1995.

The simulated water-level (layer 1) and land-subsidence values for both scenarios are shown in figures 31 and 32, respectively. Recall that the simulated water-level and land-subsidence values are averages for the entire model cell and, therefore, may be different from the measurements for specific wells and bench marks.

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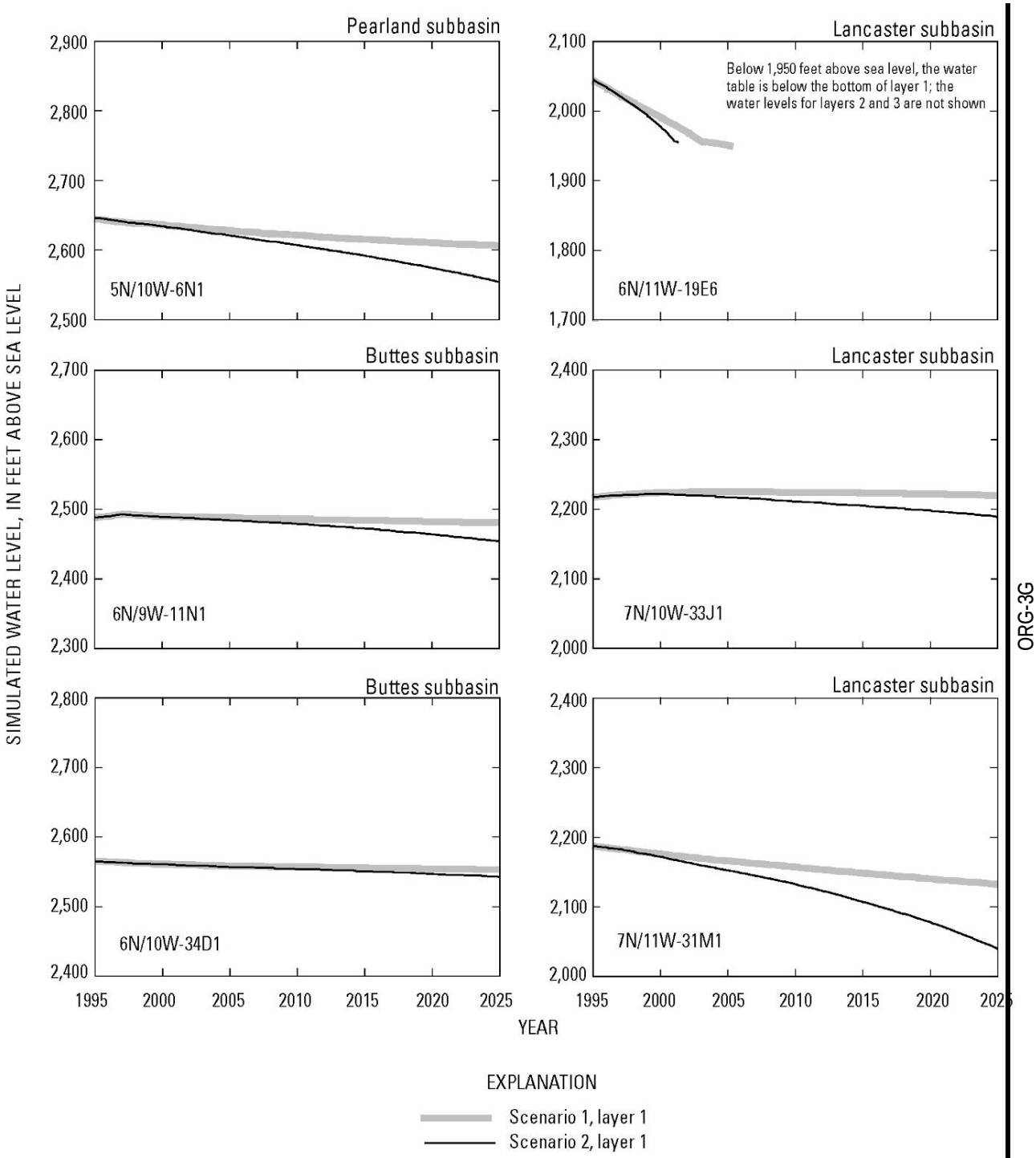

Figure 31. Simulated water levels for two pumping scenarios for the Antelope Valley ground-water basin, California, 1995–2025.

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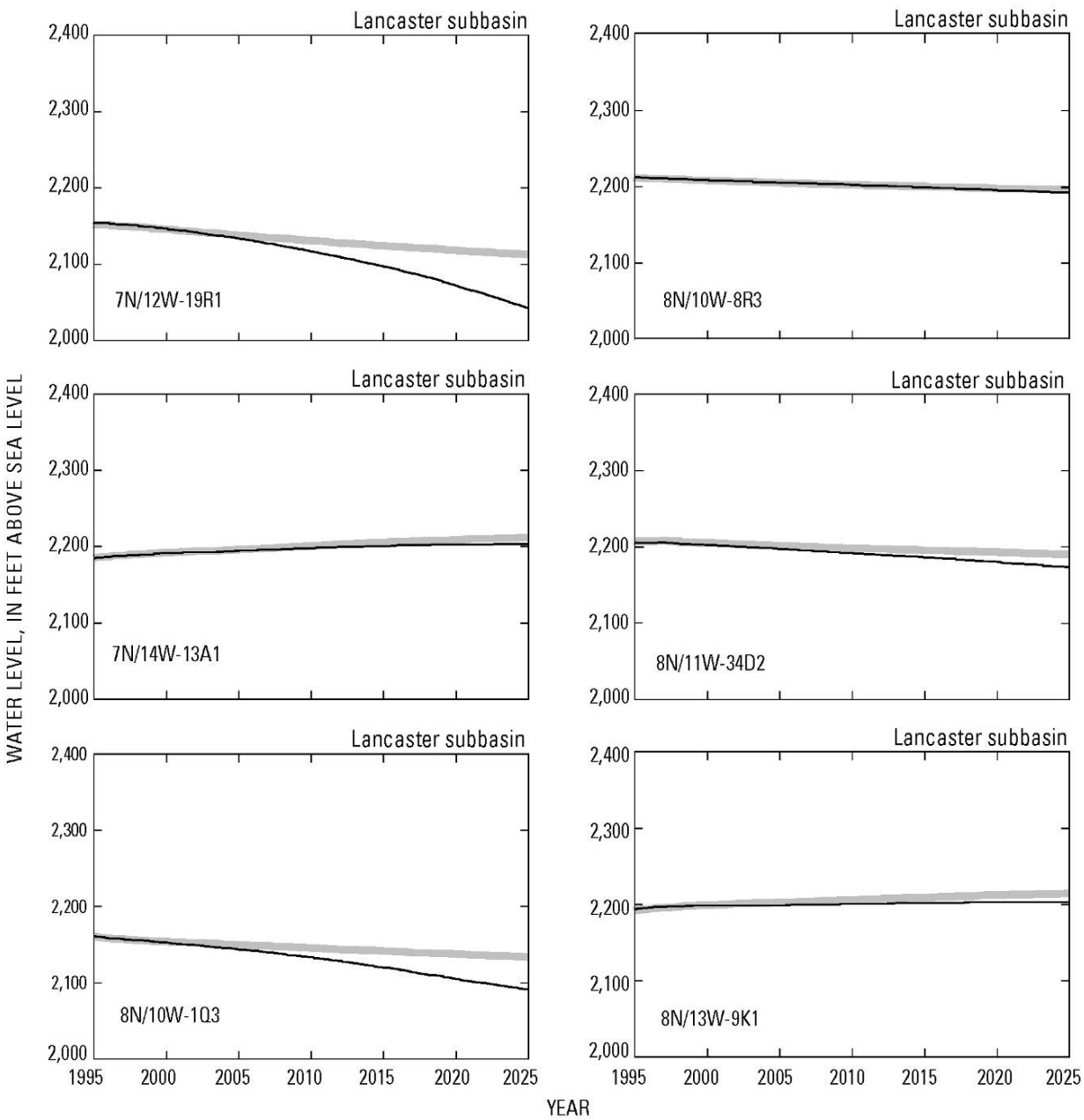

Figure 31.—Continued.

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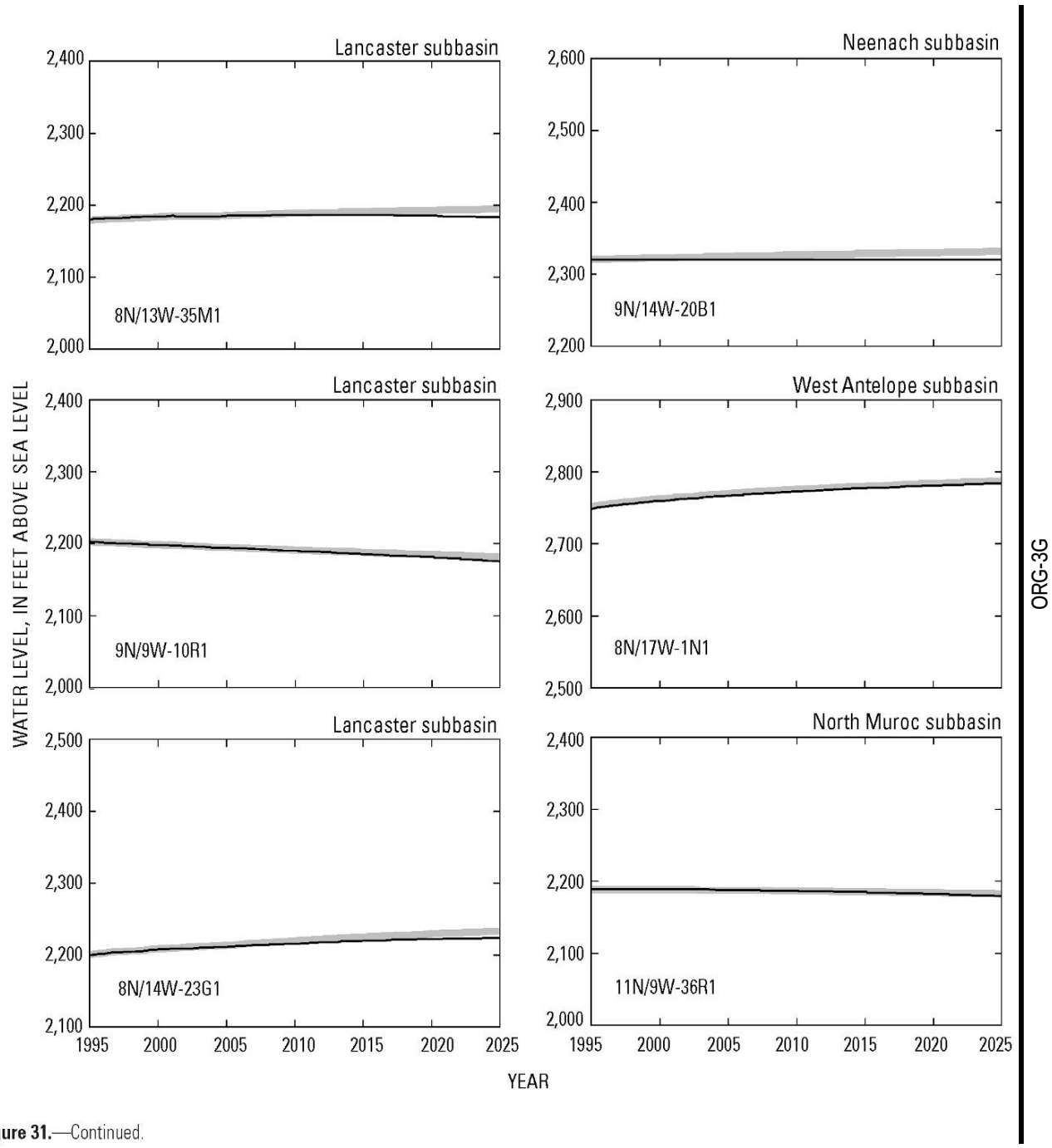

Figure 31.—Continued.

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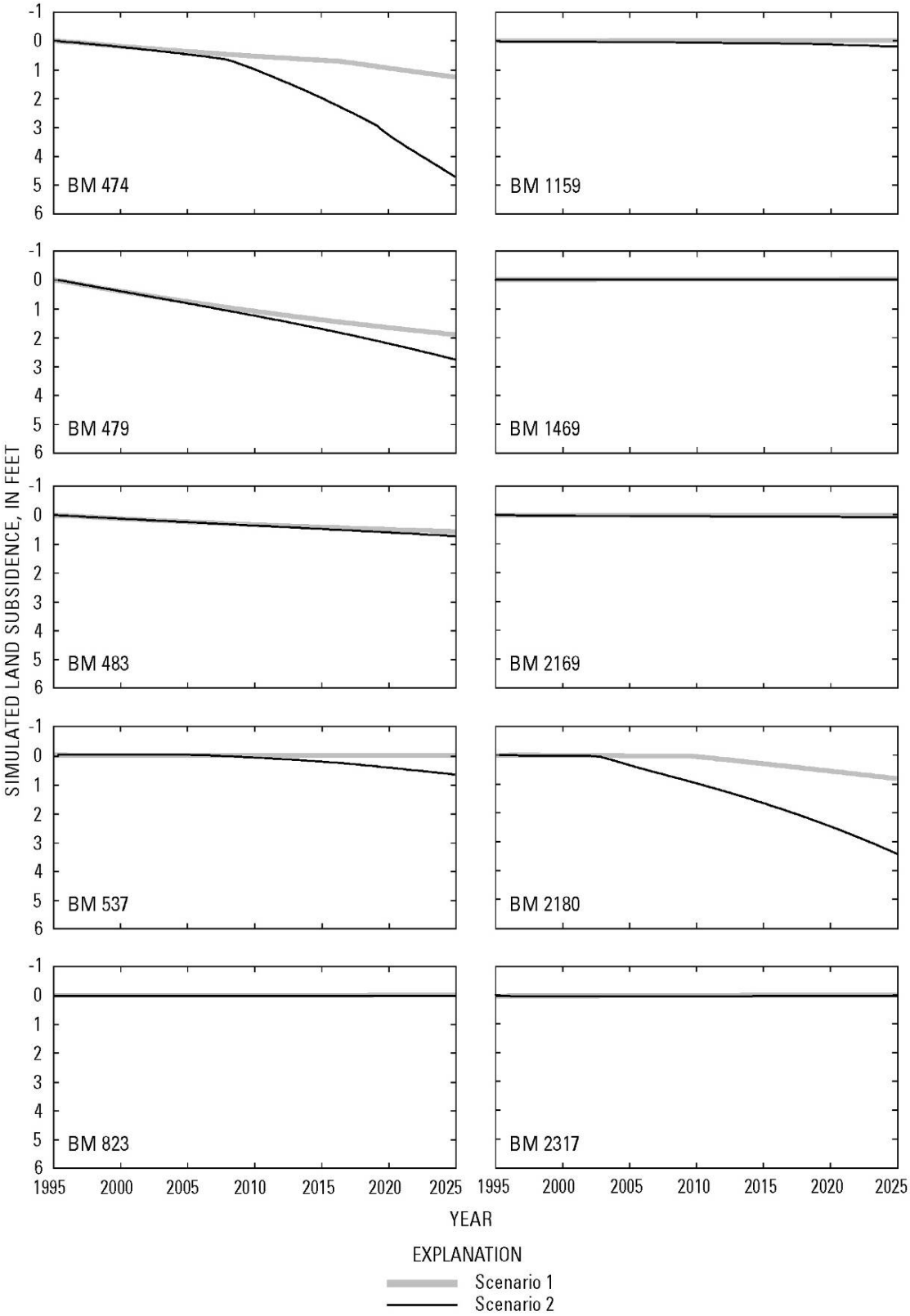

Figure 32. Simulated land subsidence near indicated bench marks for two pumping scenarios for the Antelope Valley ground-water basin California, 1995–2025.

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For scenario 1, water levels rose in the western Lancaster subbasin and in the Neenach and West Antelope subbasins, continuing the long-term recovery from drawdown caused by the much greater historical agricultural pumpage (Carlson and others, 1998; Carlson and Phillips, 1998). Water levels rose as much as 11 ft at well 9N/14W-20B1 in the Neenach subbasin and as much as 36 ft at well 8N/17W-1N1 in the West Antelope subbasin; however, the rate of the water-level rise declined over time (fig. 31). The decline in the rate of water-level rise was caused, in part, by the 10-year delay in recharge from irrigation-return flows. Even though the simulated annual pumpage was constant from 1995 to 2025, recharge from irrigation-return flows was based on agricultural pumpage prior to 1995, which was higher than in 1995. From 1996 to 2004, the annual quantity of recharge from irrigation-return flows gradually declined; in 2005, recharge from irrigation-return flows remained constant for the remainder of the simulation period. In the southern, eastern, and northern part of the Lancaster subbasin and in the Buttes, Pearland, and North Muroc subbasins, water levels generally declined as a result of the scenario 1 pumpage, except at well 7N/10W-33J1 in the eastern part of the Lancaster subbasin where water levels did not decline. The largest decline in the simulated water levels (more than 100 ft) was at well 6N/11W-19E6, where the water level declined below the bottom of model layer 1 into layer 2 in 2006. The water level in layer 2 continued to decline after 2006 (water levels for layer 2 are not shown in fig. 31). Simulated water-level declines were greatest at this well because most of the pumping for public supply occurs in this area. Further land subsidence was simulated in the central part of the Lancaster subbasin north and east of the city of Lancaster. The maximum simulated subsidence for scenario 1 occurred at bench mark BM 479 (1.9 ft). These model results indicate that pumpage for public supply at 1995 rates in the Lancaster and Palmdale areas will result in significant water-level declines and land subsidence, indicating that future pumpage may have to be redistributed or augmented by artificial recharge.

For scenario 2, public supply pumpage was increased 3.3 percent annually and annual agricultural pumpage and irrigation-return flows were 75 percent greater than the values simulated for scenario 1. Similar to scenario 1, water levels rose in the western Lancaster subbasin; however, the water-level rise was not as great. In the Neenach subbasin, the water levels for well 9N/14W-20B1 remained unchanged from 1995 to 2025. In the southern, eastern, and northern part of the Lancaster subbasin and in the Buttes and Pearland subbasins, water levels declined more than the water levels for scenario 1. Pumpage increases for scenario 2 resulted in significant water-level declines in the southern and northeastern part of the Lancaster subbasin (wells 6N/11W-19E6, 7N/12W-19R1, and 8N/10W-1Q3) because most pumping for public supply occurs in these areas. Water-level declines were as great as 150 ft in the south-central part of the Lancaster subbasin. Simulated subsidence at bench marks BM 474, BM 479, BM 537, and BM 2180 was greater for scenario 2 than for scenario 1, and the maximum simulated subsidence for 1995–2025 was about 5 ft at bench mark BM 474. The simulated subsidence was the greatest in the central Lancaster subbasin north and east of the city of Lancaster, near bench marks BM 474, BM 479, and BM 2180, where combined public supply and agricultural pumping are greatest. Because inelastic storage coefficients were specified only for areas where subsidence has previously been measured, neither scenario 1 nor 2 is able to predict subsidence from future water-level declines outside this area.

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SUMMARY

Ground-water pumpage has provided from 50 percent to more than 90 percent of the water supply in Antelope Valley since the early 1900s. This long-term ground-water pumpage has caused water-level declines and associated increased pumping lifts; it also has reduced well efficiencies and caused land subsidence. Urban growth and limited available surface-water supply are likely to continue to increase reliance on ground water. A numerical ground-water flow and land-subsidence model of the Antelope Valley ground-water basin was developed to improve the understanding of the ground-water flow system. The model can be used as a tool in making informed water-management decisions.

The Antelope Valley ground-water basin consists of unconsolidated alluvial and lacustrine deposits, more than 5,000 ft thick in places. The alluvium consists of poorly sorted gravels, sands, silts, and clays. Older, deep alluvial deposits are more compacted and indurated than the younger, shallow deposits. The lacustrine deposits are as much as 300 ft thick and are composed mostly of clay and silty clay with some layers of sand and silt. The lacustrine deposits are as much as 800 ft below land surface near Palmdale, become progressively shallower northward, and are exposed at the surface near the southern edge of Rogers Lake.

The study area was conceptually divided into seven ground-water subbasins on the basis of faults, bedrock outcrops, ground-water divides, and arbitrary boundaries. Some faults seem to act as barriers to ground-water flow. Geophysical logs from previous studies show that induration of the alluvial material increases with depth, which suggests a decrease in the ability to transmit and store water with depth. Data from test wells drilled in the Lancaster area and at Edwards Air Force Base indicate that there is a change in the properties of the aquifer materials at altitudes of about 1,950 ft and 1,550 ft above sea level. Unconsolidated material at altitudes of 1,950 ft above sea level and greater was designated as the upper aquifer, unconsolidated material between 1,950 and 1,550 ft above sea level was designated as the middle aquifer, and unconsolidated material below 1,550 ft above sea level was designated as the lower aquifer. The lacustrine deposits are contained within the upper aquifer in the northern part of the Lancaster subbasin and primarily within the middle aquifer in the southern part of the Lancaster subbasin. The upper aquifer is unconfined to confined and the middle and lower aquifers are confined.

Prior to ground-water development in Antelope Valley, recharge to the ground-water system was primarily from the infiltration of precipitation runoff near the valley margins. Precipitation over the valley floor generally is less than 10 in./yr and probably contributes little, if any, recharging to the aquifer system owing to the high evapotranspiration rates in the study area. In the lowland parts of the valley, discharge from the aquifer system was primarily from evapotranspiration. A small amount of ground water is discharged from the valley north into the Fremont Valley Basin.

Development of the ground-water system began around 1915 and increased rapidly into the 1950s. Ground-water pumping has caused large water-level declines in the ground-water basin; as a result, evapotranspiration has decreased to an insignificant amount. The water-level declines from pumping also have caused land subsidence owing to the compaction of compressible sediments. The major source of discharge in the valley has changed from evapotranspiration to ground-water pumping; ground water now flows from areas of recharge toward the major pumping centers rather than to natural discharge areas where evapotranspiration had occurred. Recharge from the infiltration of irrigation-return flows is a major contributor of recharge to the aquifer system.

A numerical ground-water flow model was developed and calibrated for steady-state pre-development (1915) and transient-state (1915–95) conditions. The model aggregates old and new geohydrologic information to aid in better understanding the ground-water flow system and to aid in making informed water-management decisions. The model was vertically discretized into three layers. Layer 1 (upper aquifer) extends from the water table to an altitude of 1,950 ft above sea level or to bedrock, whichever is higher; layer 2 (middle aquifer) extends from 1,950 to 1,550 ft above sea level or to bedrock, whichever is higher; layer 3 (lower aquifer) extends from 1,550 to 1,000 ft above sea level or to bedrock, whichever is higher. The bottom of layer 3 was set to an altitude of 1,000 ft because it was assumed that the alluvial material below this depth was not a significant part of the flow system owing to compaction and induration of this older material.

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The model was calibrated by adjusting hydraulic conductivity, transmissivity, specific yield, natural recharge, aquitard thickness, hydraulic characteristic of flow barriers, and preconsolidation head within reasonable limits to obtain reasonable agreement between simulated and measured water levels and subsidence. The model did well in simulating water levels in the Lancaster, Neenach, Pearland, and Buttes subbasins where the geohydrology is well known. In the North Muroc Subbasin, measured and simulated horizontal and vertical water-level gradients match well; however, the simulated water levels were higher than the measured water levels. In the Finger Buttes and West Antelope subbasins, where few geohydrologic data are available, the match between the simulated and the measured water levels was not as good. Measured and simulated land subsidence data also were compared and matched well at all the bench marks used for calibration.

During model calibration, natural recharge was reduced from an initial estimate of 40,700 acre-ft/yr to 30,300 acre-ft/yr. Results of the transient-state simulation indicate that more than 8.5 million acre-ft of ground water was removed from storage during 1915–95, with most of the storage change occurring between about 1945 and 1975. Ground-water storage changed little during the final 10 years of simulation period because discharge by pumpage had declined sufficiently to be balanced by recharge. Model results show that during the period of peak pumping (1949–53) 79 percent of the ground water withdrawn from the aquifer came from storage. Water released from compaction of the aquitards accounted for about 21,600 acre-ft/yr of the ground water removed from storage. Pumpage from layer 2 induced leakage of ground water from layer 1, which accounted for about 86 percent of the total pumpage in layer 2. During the last 5 years of the simulation (1991–95), only 17 percent of pumpage came from storage.

Results of the sensitivity analysis showed that the model was most sensitive to changes in the hydraulic characteristic of flow barriers, specific yield, hydraulic conductivity of layer 1, natural recharge, inelastic skeletal storage coefficient, transmissivity of layer 2, and pumpage. The sensitivity of the model varied spatially. The model was not sensitive to the transmissivity of layer 3, which indicates that specifying the bottom of the model at 1,000 ft above sea level was a reasonable assumption.

The calibrated model was used to test the aquifer response to two future pumping scenarios for 1995 to 2025. For scenario 1, annual pumpage remained the same as pumpage specified for 1995. Water levels rose in the western Lancaster subbasin and in the Neenach and West Antelope subbasins, continuing the long-term recovery from drawdown caused by the much greater historical agricultural pumpage. In areas where pumping for public supply is concentrated, water levels continued to decline and subsidence continued in the central part of the Lancaster subbasin. Water-level declines were greatest (more than 100 ft) in the south-central part of the basin because most of the public supply pumpage occurs in this area; as much as 1.9 ft of additional subsidence was simulated in the central part of the ground-water basin for 1995 through 2025. For scenario 2, public supply pumpage was increased 3.3 percent annually compared with that specified for 1995 and agricultural pumpage was increased 75 percent. This scenario resulted in significant water-level declines in the southern and eastern part of the Lancaster subbasin because most of the public supply and agricultural pumping occurs in these areas. Results of this simulation showed that water levels declined more than 150 feet in the south-central part of the ground-water basin and that an additional 5 feet of subsidence was simulated in the central part of the basin.

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APPENDIX: WATER USE 1992–95

Water managers and planners require comprehensive and accurate water-use data to make informed water-management decisions. Templin and others (1995) compiled available water-use data for Antelope Valley for 1919–92 (1992 data were incomplete). For the purpose of this study, annual water-use data for 1992–95 were compiled to extend the period of record reported by Templin and others (1995) for use in the ground-water flow and subsidence model developed for this study.

The methodology, sources, and areal extent [Antelope Valley drainage basin (fig. 1)] used to obtain the water-use data for 1992–95 were consistent with those used by Templin and others (1995) so that data for all years could be compared and analyzed. As a part of their work, Templin and others (1995) developed a database of ground-water pumpage for 1947–92; during this current study, pumpage data for 1992–95 were collected and added to the 1947–92 database. Some additional data for 1947–91 also were obtained and added to the database. The tables in this appendix include data only for 1992–95, but the graphs show data for the entire period of the pumpage database (1947–95) and, therefore, can show trends in water use over time.

Water supply for Antelope Valley was obtained from four sources; (1) ground-water pumping, (2) local surface-water diversions, (3) imported water, and (4) reclaimed wastewater. Each of these components and total annual water supply for 1947–95 are shown in figure A1. Total water supply increased during 1992–95 because of increases in imported surface water in 1992 and 1993, increases in ground-water pumping in 1994 and 1995, and increased use of reclaimed wastewater. Historically, ground-water pumping has been the primary source of water supply in the valley, and remained the primary source during 1992–95. Supply from local surface-water sources was small and generally remained steady during 1992–95.

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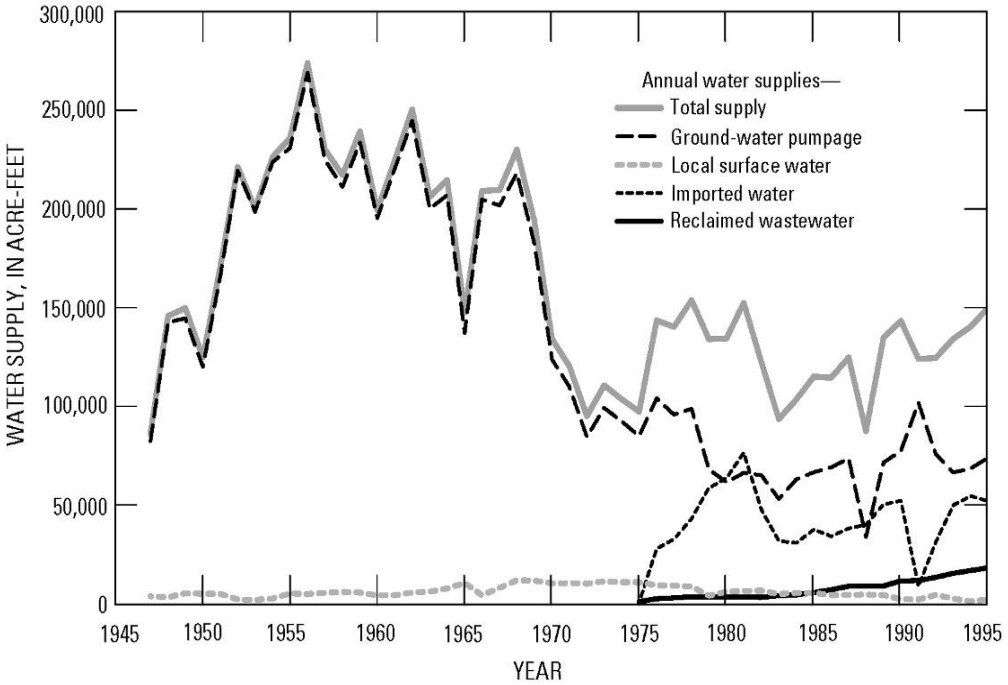

Figure A1. Sources of water supply in the Antelope Valley ground-water basin, California, 1947–95.

Ground Water

Templin and others (1995) divided ground-water use into two categories, public supply and self supply. Ground-water pumpage for public supply represents ground water that is withdrawn by public or private entities for sale and delivery to customers, usually for domestic, commercial, and industrial uses. Ground-water pumpage for self supply represents ground water that is withdrawn by private entities for use by that entity. In Antelope Valley, most ground-water pumpage for self supply is used for agriculture and in this report is referred to as agricultural pumpage. Most of the ground-water-use data for public supply was obtained by contacting the suppliers directly; however, some of the data were obtained from pumpage records maintained by the California State Water Resources Control Board (SWRCB). Agricultural-pumpage data were obtained primarily from the records of the SWRCB, but these records are limited to wells in the Los Angeles County and San Bernardino County parts of Antelope Valley. Because the SWRCB does not require that agricultural pumpage in Kern County be reported, data for that part of Antelope Valley are nonexistent.

Ground-water pumpage by user is shown in tables A1 (public supply) and A2 (agricultural supply). Figure A2 shows annual ground-water pumpage for the entire period of record (1947–95) in the pumpage database. Note that the agricultural pumping presented in the data base (figure A2) is less than the agricultural pumpage estimated for this study (table 8). Templin and others (1995) noted that ground-water pumpage reported to the SWRCB may not accurately reflect actual pumpage in the valley because of evidence of underreporting and overreporting of annual pumpage, reporting of identical amounts of pumpage year after year, and inaccurate methods of estimating pumpage. Also, although agricultural-pumpage data for the Kern County part of the study areas does not exist, the data reported in table A2 are the best available data at the time of this current study. Additional work is needed to improve estimates of the quantity and spatial distribution of agricultural pumpage.

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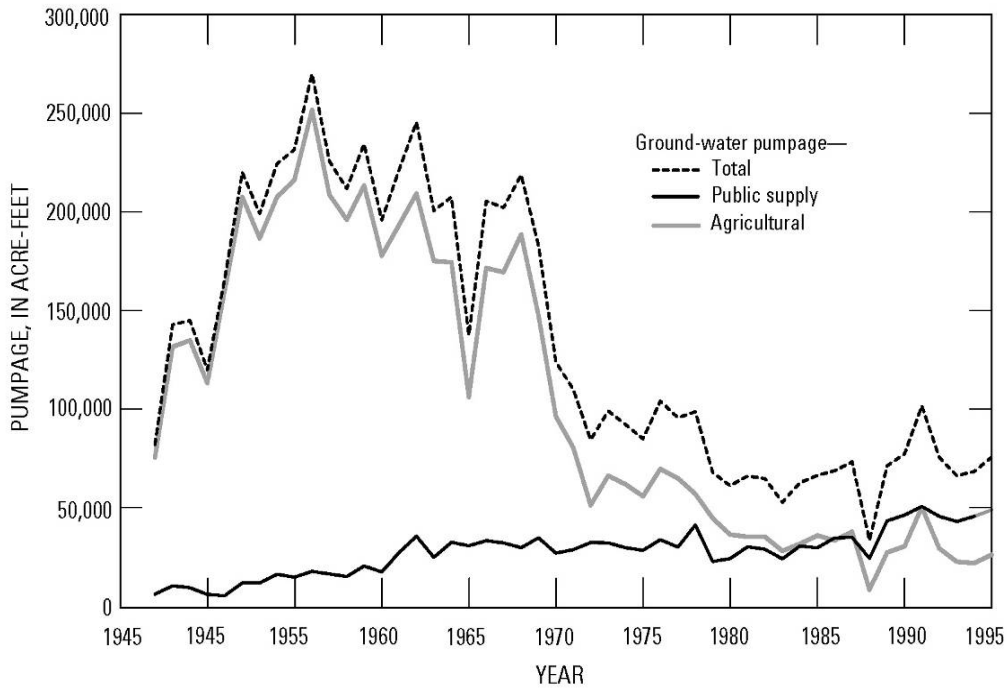

Figure A2. Ground-water pumpage recorded in the pumpage database for Antelope Valley, California, 1947–95.

Surface Water

Water supply from surface water comes from local surface-water diversions and from imported water by way of the California Aqueduct. Imported water provides a much larger proportion of surface-water supply than local surface-water diversions. The availability of imported water is controlled primarily by rainfall conditions in northern California. Minimal local rainfall and limited storage facilities prevent local surface water from becoming a significant component of water supply in Antelope Valley.

Local Surface Water

Local surface-water diversions are used for public supply and agriculture. Data on local surface-water diversions for public supply were obtained directly from the public supply entities (table A1). Palmdale Water District was the only user of local surface water for public supply for which data were available during 1992–95 (table A1).

Data on local surface-water diversions for agricultural supply (table A2) were obtained from the SWRCB, Division of Water Rights. These data and the self-supplied surface-water data reported by Templin and others (1995) indicate that, for many users, the quantity of reported local surface-water use often is constant over a period of several years. These constant values probably are due to users reporting their water-rights entitlement rather than their actual usage.

Imported Water

Data on the annual quantity of imported water was obtained directly from the public entities that distribute the water (table A3). The annual quantity of water imported by the Antelope Valley–East Kern Water Agency (AVEK) represents only those deliveries made within the study area defined in this report. Imported water averaged about 48,900 acre-ft/yr for 1992–95 (table A3), which is less than one-third of the annual entitlement of 158,000 acre-ft reported by Templin and others (1995). Imported water is used for both public supply and agriculture.

Reclaimed Wastewater

Data on water supply from reclaimed wastewater from the Lancaster and Palmdale Water Reclamation Plants (David Lambert, County Sanitations Districts of Los Angeles County, written commun., 1996) are shown in table A4. These two facilities are the largest treatment plants in the study area; there are about 10 additional treatment plants that treat much smaller quantities of wastewater. Templin and others (1995) reported that the Lancaster and Palmdale facilities accounted for 84 percent of the treated wastewater in Antelope Valley in 1990 (a year when data were available for all treatment plants). Discharge of treated wastewater from the Lancaster Water Reclamation Plant used for wetlands (table A4) is slightly higher than the wastewater discharge shown in table 1 because a small amount of the treated wastewater discharge from the Lancaster Water Reclamation Plant is diverted to a wildlife pond.

The quantity of reclaimed wastewater available for water supply has increased almost every year since 1975 (fig. A3) due to increases in population and in treatment capacities. In 1995, reclaimed wastewater represented about 12 percent of the total available supply in Antelope Valley. Treated wastewater disposed to land surfaces is subject to evapotranspiration and infiltration to the ground-water system. There is potential for identifying more beneficial uses for this component of reclaimed wastewater.

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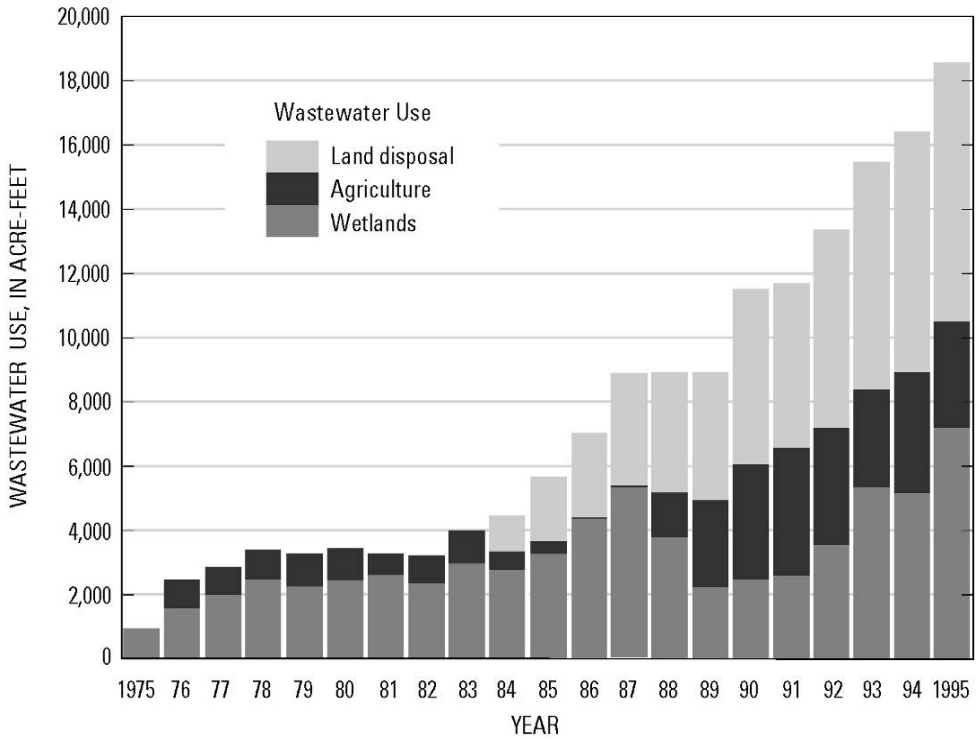

Figure A3. Wastewater use in Antelope Valley ground-water basin, California, 1975–95.

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Owing to the depth to the water table and the existence of thin aquitards, a time delay is likely between the onset of irrigation and the recharge of this water to the regional water table. Snyder (1955) stated that agricultural recharge probably had reached the water table by the early 1950s, but Durbin (1978) assumed that no irrigation water had reached the water table by 1961. Durbin (1978) based this assumption on water-chemistry data collected from wells in agricultural areas that showed little change in dissolved solids over time. However, it is likely that water had reached the water table much sooner than estimated by Snyder (1955) or Durbin (1978). Results from a simple model of the unsaturated zone indicate that, in a silt loam, recharge will infiltrate to a depth of about 120 ft approximately 10 years after the water is applied at land surface (Alan Flint, U.S. Geological Survey, written commun., 1999).

The largest producers of reclaimed wastewater in the study area are the Palmdale Water Reclamation Plant and the Lancaster Water Reclamation Plant (Templin and others, 1995). Beginning in 1975, reclaimed wastewater has been disposed of in ponds or on spreading grounds where the water is spread over land surface to evaporate or infiltrate below land surface. A small amount of reclaimed wastewater is reused primarily for agriculture (Templin and others, 1995). The quantity of disposed wastewater to reach the regional water table as recharge was estimated by subtracting the estimated evaporation from the quantity of reclaimed water that is disposed of in the ponds or on spreading grounds. At the Palmdale Water Reclamation Plant, reclaimed wastewater is spread on approximately 60 acres of land. On the basis of a pan evaporation rate of 114 in./yr for Antelope Valley (Bloyd, 1967), it was estimated for this study that about 570 acre-ft/yr is lost to evaporation. At the Lancaster Water Reclamation Plant, wastewater is disposed of in ponds with an area of approximately 430 acres and evaporation was estimated to be about 4,080 acre-ft/yr. The estimated evaporation was subtracted from the quantity of reclaimed wastewater (David Lambert, County Sanitation Districts of Los Angeles County, written commun., 1996) to estimate the recharge to the water table at these sites (table 1) (fig. 12).

Table A1. Water-use information for public water suppliers in Antelope Valley, California, by water-supply sources, 1992–955

[Units are in acre-feet. USAF, United States Air Force. —, no data]

Year	Antelope Park Mutual Water Company	Antelope Valley Indian Museum	Antelope Valley Union High School District	Antelope Valley Water Company			Aqua J Mutual Water Company Inc.	Averydale Mutual Water Company
	Ground water	Ground water	Ground water	Ground water	Purchased water	Total	Ground water	Ground water
1992	161.1	0.5	—	569.7	207.0	776.7	53.6	287.8
1993	149.5	.5	236.0	616.3	176.0	792.3	58.2	296.1
1994	162.5	.5	238.0	—	171.0	171.0	59.0	317.6
1995	162.0	.5	—	—	171.0	171.0	64.2	312.2

Year	Bleich Flat Mutual Water Company	Boeing (Rockwell) USAF Plant 42	Boron Community Service District			California Poppy Reserve		
	Ground water	Ground water	Ground water	Purchased water	Total	Ground water	Purchased water	Total
1992	17.2	149.6	253.0	253.0	506.0	0.5	16.0	16.5
1993	16.3	80.9	305.0	305.0	610.0	.5	.0	.5
1994	16.9	129.3	—	548.0	548.0	.8	.0	.8
1995	21.0	120.5	—	569.0	569.0	.7	.0	.7

Year	Desert Lake Community Services District			Edgemont Acres Mutual Water Company	Edwards Air Force Base (Main Base)			Edwards Air Force Base (Rocket Site)
	Ground water	Purchased water	Total	Purchased water	Ground water	Purchased water	Total	Ground water
1992	348.0	24.0	372.0	70.0	4,794.2	0.0	4,794.2	431.8
1993	353.0	43.0	396.0	53.0	3,498.8	1,345.0	4,843.8	415.0
1994	—	174.0	174.0	27.0	3,162.3	2,103.0	5,265.3	419.4
1995	—	314.0	314.0	45.0	3,803.8	1,171.0	4,974.8	435.1

Year	El Dorado Mutual Water Company			Evergreen Mutual Water Company	Landale Mutual Water Company			Land Projects Mutual Water Company	Little Baldy Water Company
	Ground water	Purchased water	Total	Ground water	Ground water	Purchased water	Total	Ground water	Surface water
1992	117.4	186.6	304.0	80.0	0.0	1.0	1.0	795.5	21.7
1993	195.3	114.8	210.1	81.0	220.7	15.0	235.7	782.6	21.7
1994	39.6	302.0	341.6	82.0	—	.0	.0	915.4	21.7
1995	47.5	297.7	345.2	81.0	—	.0	.0	869.7	—

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Table A1. Water-use information for public water suppliers in Antelope Valley, California, by water-supply sources, 1992–95—Continued

Year	Littlerock Creek Irrigation District				Lockhead Martin USAF Plant 42			Los Angeles County	Los Angeles County Sheriff Mira Loma Facility
	Ground water	Surface water	Purchased water	Total	Ground water	Purchased water	Total	Surface water	Ground water
1992	1,212.0	1,420	251.0	2,882	—	12.0	12.0	8.7	188.7
1993	1,270.0	1,105	735.0	3,110	74.4	14.3	88.7	8.7	.0
1994	1,615.0	1,100	1,100.0	3,815	9.3	1.2	10.5	8.7	81.2
1995	1,630.0	6	480.0	2,116	7.1	.6	7.7	8.7	235.0

Year	Los Angeles County Waterworks District No. 4			Los Angeles County Waterworks District No. 24			Los Angeles County Waterworks District No. 27
	Ground water	Purchased water	Total	Ground water	Purchased water	Total	Ground water
1992	13,771.8	12,691.0	26,462.8	117.3	219.0	336.3	366.8
1993	13,368.8	16,765.0	30,133.8	66.3	513.0	579.3	196.1
1994	14,942.9	16,757.0	31,699.9	4.5	579.0	583.5	426.9
1995	17,782.6	13,850.0	31,632.6	42.8	495.0	537.8	835.6

Year	Los Angeles County Waterworks District No. 33			Los Angeles County Waterworks District No. 34			Los Angeles County Waterworks District No. 35		
	Ground water	Purchased water	Total	Ground water	Purchased water	Total	Ground water	Purchased water	Total
1992	0.0	823.0	823.0	258.5	2,738.0	2,996.5	86.8	161.7	248.5
1993	.0	991.0	991.0	199.3	3,649.0	3,848.3	26.0	240.7	266.7
1994	.0	1,049.0	1,049.0	224.0	4,035.0	4,259.0	79.0	217.1	296.1
1995	.0	776.0	776.0	438.3	4,023.0	4,461.3	82.2	219.4	301.6

Year	Los Angeles County Waterworks District No. 38			Los Angeles County Waterworks District No. 39			Mojave Public Utility District		
	Ground water	Purchased water	Total	Ground water	Purchased water	Total	Ground water	Purchased water	Total
1992	200.5	2,068.7	2,269.2	239.0	0.0	239.0	0.0	433.0	433.0
1993	264.2	2,248.2	2,512.4	267.1	.0	267.1	—	78.0	78.0
1994	1,059.5	1,689.0	2,748.5	228.2	20.5	248.7	—	380.0	380.0
1995	478.8	2,327.8	2,806.6	208.4	.0	208.4	—	118.0	118.0

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Table A1. Water-use information for public water suppliers in Antelope Valley, California, by water-supply sources, 1992–95—Continued

Year	North Edwards Water District	Northrop Corporation B-2 Division	Oak Springs Valley Water Company	Palmdale Water District			
	Ground water	Ground water	Ground water	Ground water	Surface water	Purchased water	Total
1992	0.0	138.6	0.0	10,295.0	3,449.0	3,845.0	17,589.0
1993	—	136.9	—	8,209.0	2,538.0	10,136.0	20,883.0
1994	—	128.2	—	11,458.0	1,123.0	8,037.0	20,618.0
1995	—	117.8	—	11,277.0	3,771.0	6,613.0	21,661.0

Year	Palm Ranch Irrigation District			Quartz Hill Water District			Rosamond Community Service District		
	Ground water	Purchased water	Total	Ground water	Purchased water	Total	Ground water	Purchased water	Total
1992	682.0	679.0	1,361.0	1,028.0	1,646.0	2,674.0	1,090.0	877.7	1,967.7
1993	1,151.0	175.0	1,326.0	811.8	1,833.0	2,644.8	1,025.0	1,295.1	2,320.1
1994	962.0	515.0	1,477.0	1,044.6	2,485.0	3,529.6	1,025.0	1,457.7	2,482.7
1995	758.0	736.0	1,494.0	—	2,098.0	2,098.0	826.0	1,632.6	2,458.6

Year	Saddleback Butte State Park	Saint Andrews Priory	San Bernardino County Service Area No. 70L			Shadow Acres Mutual Water Company		
	Purchased water	Ground water	Ground water	Surface water	Total	Ground water	Purchased water	Total
1992	0.9	—	874.3	0.0	874.3	3.7	133.0	136.7
1993	.9	—	934.9	.0	934.9	4.0	160.0	164.0
1994	.9	—	678.2	.0	678.2	4.3	154.0	158.3
1995	.9	321.0	906.8	.0	906.8	4.6	163.0	167.6

Year	Sunnyside Farms Mutual Water Company			Tierra Bonita Mutual Water Company	U.S. Borax and Chemical Corporation		
	Ground water	Purchased water	Total	Ground water	Ground water	Purchased water	Total
1992	4.6	226.0	230.6	16.9	1,436.3	595.4	2,031.7
1993	4.6	219.0	223.6	16.9	1,289.0	705.9	1,994.9
1994	4.6	236.0	240.6	16.9	386.7	1,556.0	1,942.7
1995	4.6	242.0	246.6	16.9	21.5	2,538.1	2,559.6

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Table A1. Water-use information for public water suppliers in Antelope Valley, California, by water-supply sources, 1992–95—Continued

Year	West Side Park Mutual Water Company			West Valley County Water District	White Fence Farms Mutual Water Company 2			White Fence Farms Mutual Water Company 3
	Ground water	Purchased water	Total	Ground water	Ground water	Purchased water	Total	Purchased water
1992	230.0	0.0	230.0	141.2	590.4	21.8	612.2	391.0
1993	176.0	47.0	223.0	141.2	257.5	398.2	655.7	382.0
1994	96.7	131.2	227.9	165.7	304.9	319.6	624.5	425.0
1995	238.0	24.0	262.0	153.4	583.5	119.7	703.2	414.0

Year	Total			Grand total
	Ground water	Purchased water	Surface water	
1992	46,129.8	3,575.0	28,319.8	78,024.6
1993	43,571.7	2,664.0	41,903.1	88,138.8
1994	46,212.6	1,249.0	43,370.1	90,831.6
1995	49,333.1	3,897.0	38,958.8	92,188.8

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Table A2. Water-use information for self-supplied water users in Antelope Valley, California, by water-supply sources, 1992–95

[Units are in acre-feet. —, no data

Year	No owner recorded	Alesso Farms	Almondale Farms	Antelope Valley Country Club			Association of Irrigation Water Users	Baicy, John (Rumar)		
	Ground water	Ground water	Purchased water	Ground water	Purchased water	Total	Purchased water	Ground water	Purchased water	Total
1992	84.0	0.0	725.0	208.0	277.0	485.0	27.0	488.0	-488.0	0.0
1993	160.0	—	1,102.0	14.6	402.0	416.6	31.0	.0	.0	.0
1994	62.6	—	1,156.0	.0	473.0	473.0	27.0	.0	.0	.0
1995	.0	—	925.0	.0	417.0	417.0	31.0	.0	333.0	333.0

Year	Ball, William and Mildred	Beery Ranch			Bell, Louis and Sandra	Bio Gro Systems, Inc.	Biscaichipy Ranch	Blalock-Eddy Ranch Co.	Blua, Andrew
	Surface water	Ground water	Purchased water	Total	Surface water	Purchased water	Purchased water	Surface water	Ground water
1992	22.4	—	0.0	0.0	63.9	0.0	253.0	312	0.0
1993	22.4	—	845.0	845.0	63.9	.0	431.0	368	—
1994	22.4	—	509.0	509.0	63.9	1,112.0	930.0	578	—
1995	22.4	—	509.0	509.0	63.9	854.0	947.0	916	—

Year	Bonnie AC Ranch			Bozigian Ranch			Bryden, Lloyd W.	Bushnell, David P.	Buchanan, Virginia	Calandri Ranch		
	Ground water	Surface water	Total	Ground water	Purchased water	Total	Ground water	Ground water	Surface water	Ground water	Purchased water	Total
1992	0.0	—	0.0	90.0	-90.0	0.0	0.0	0.0	14.5	—	0.0	0.0
1993	—	—	—	—	.0	.0	—	—	—	—	.0	.0
1994	—	—	—	—	.0	.0	—	—	—	—	.0	.0
1995	—	—	—	—	972.0	972.0	—	—	—	—	.0	.0

Year	California Portland Cement Company			California Resources Enterprises, Inc.	Calmat Co.	Cameo Ranching Co.	Carter, Maurice R.	Castronova, Daniel	Caton, Robert and Richard
	Ground water	Surface water	Total	Ground water	Ground water	Ground water	Ground water	Purchased water	Ground water
1992	0.0	—	0.0	0.0	389.5	870.3	0.0	7.0	0.0
1993	—	166.4	166.4	—	258.9	1,233.9	—	9.0	—
1994	—	155.6	155.6	—	.0	877.5	—	6.0	—
1995	—	159.0	159.0	—	310.3	1,175.9	—	7.0	—

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Table A2. Water-use information for self-supplied water users in Antelope Valley, California, by water-supply sources, 1992–95—Continued

Year	Christoff, Chris A.	Church of Latter Day Saints	Circle JM Ranch	City Ranch	Clark, Dick	Clayton, Richard, M.	Cole, J.G., and Sons	Coor-Pender, R.L. and Ruth B.	Compton, Alan and Carol (previously Jerome Thompson)
	Ground water	Ground water	Ground water	Purchased water	Purchased water	Ground water	Ground water	Ground water	Surface water
1992	128.0	0.0	0.0	0.0	6.0	0.0	0.0	0.0	3.1
1993	110.0	—	—	.0	6.0	—	—	—	3.1
1994	129.0	—	—	.0	6.0	—	—	—	3.1
1995	129.0	—	—	.0	6.0	—	—	—	3.1

Year	Corpus Cenon, and Regina	Davis, Shelton	Delia, Joseph, E.	Derosier, Lionel P. and Particia	Derrick, Olin E.	Dustin, Doug	DVM	EPIC/Smith Development Company	Fabe
	Ground water	Ground water	Ground water	Ground water	Ground water	Ground water	Ground water	Ground water	Purchased water
1992	0.0	0.0	34.3	0.0	0.0	0.0	0.0	0.0	0.0
1993	—	—	45.5	—	—	—	—	—	.0
1994	—	—	65.0	—	—	—	—	—	.0
1995	—	—	45.5	—	—	—	—	—	.0

Year	Freund, Jerry	Frisella, Josef	Fuson	Gagik Galstian, Trustee	Gallin, Leo and Ruth Morton	Gonzales, Avelino and Hazel	Graham, John and others	Grainger, Donald L.	Greco, Connie Marie
	Purchased water	Ground water	Purchased water	Ground water	Ground water	Surface water	Surface water	Ground water	Surface water
1992	1.0	0.0	−230.0	0.0	0.0	0.3	1.1	0.0	0.8
1993	.0	—	.0	—	—	.3	1.1	—	.8
1994	5.0	—	.0	—	—	.3	1.1	—	.8
1995	6.0	—	.0	—	—	.4	1.1	—	.8

Year	Griffen, Laura	Groven, Dennis L.	Harter, Leo A.	Hathaway Ranch	Healy Enterprises Inc.	Hecht, Nathaniel	Hee, Thornton, and Patti	Heiner, David R.
	Ground water	Ground water	Ground water	Ground water	Ground water	Surface water	Ground water	Ground water
1992	0.0	600.0	0.0	0.0	0.0	—	0.0	0.0
1993	—	600.0	—	—	—	—	—	—
1994	—	600.0	—	—	—	—	—	—
1995	—	360.0	—	—	—	0.8	—	—

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Table A2. Water-use information for self-supplied water users in Antelope Valley, California, by water-supply sources, 1992–95—Continued

Year	Hicks, Lucius B.	Hines, Robert G.	Hughes	Hughes Development Corporation	Hughes, Rodger	Iarussi, Armando	Johnson, Malachi S.	Johnston, Arch D.	Kadivar, Steve
	Ground water	Ground water	Purchased water	Purchased water	Purchased water	Purchased water	Ground water	Ground water	Ground water
1992	0.0	0.0	-99.0	0.0	7.0	2.0	0.0	84.9	0.0
1993	.0	—	.0	.0	21.0	7.0	—	84.9	—
1994	.0	—	.0	.0	23.0	9.0	—	84.9	—
1995	20.0	—	.0	.0	17.0	57.0	—	94.9	—

Year	Kaufman and Broad Land Company			Kellerman, Pat	Kelly Ranch	Kindig, George B.	Kindig, Paul S.	Kirby, James and Robert	Kleksted Tree Farm
	Ground water	Purchased water	Total	Purchased water	Purchased water	Ground water	Ground water	Surface water	Purchased water
1992	0.0	0.0	0.0	6.0	0.0	0.0	0.0	2.9	0.0
1993	—	.0	.0	6.0	.0	.0	.0	2.9	.0
1994	—	.0	.0	6.0	.0	.0	.0	1.0	.0
1995	—	16.0	16.0	7.0	525.0	.0	.0	1.0	.0

Year	Kuete, Les	Kungl, Karl	Kyle, J.W. and G.W.	Lade R.M./Hartford Management Co.	Lake, Twyla and Larry	Lane, Frank A.			Larsen Brothers		
	Purchased water	Ground water	Ground water	Ground water	Ground water	Ground water	Purchased water	Total	Ground water	Purchased water	Total
1992	6.0	15.0	6,639.0	0.0	12.0	397.0	31.0	428.0	0.0	0.0	0.0
1993	6.0	15.0	6,359.8	—	686.0	397.0	43.0	440.0	—	.0	.0
1994	6.0	.0	5,343.0	—	15.0	300.0	58.0	358.0	—	.0	.0
1995	6.0	.1	7,108.0	—	2,744.0	300.0	39.0	339.0	—	.0	.0

Year	Leona Valley Estates Ltd.	Leviste Management Systems	Littlerock Aggregate Company	Llarena, Albert	Los Angeles Department of Airports	Los Angeles Firemen's Relief Assoc.	Lowe, John and Becky	Margaretten, Joel	Montemayer, Abel and others
	Purchased water	Ground water	Ground water	Ground water	Ground water	Ground water	Surface water	Surface water	Surface water
1992	4.0	0.0	305.0	0.0	5,097.5	0.0	2.2	19.7	5.1
1993	.0	.0	305.0	.0	6,376.0	—	2.2	19.7	5.1
1994	.0	.0	270.0	.0	5,723.0	3,295.0	2.2	19.7	5.1
1995	.0	.0	270.0	.0	6,445.0	—	2.2	19.7	5.1

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Table A2. Water-use information for self-supplied water users in Antelope Valley, California, by water-supply sources, 1992–95—Continued

Year	McCormick, Raymond W.	Mescal Creek Water, Inc.	Miccolis, F.P. Adele Bruno	Milford, Terry	Miller, Keith	Mitchel and Gunning	Monsello, Andrew	Morgan, Carlos, Estate of	Morris, Wayne F. and Annette L.
	Ground water	Surface water	Ground water	Purchased water	Purchased water	Purchased water	Ground water	Ground water	Surface water
1992	0.0	915.8	0.0	6.0	11.0	46.0	0.0	5.0	1.6
1993	—	915.8	—	6.0	10.0	482.0	—	2.0	—
1994	—	1,220.7	—	6.0	11.0	826.0	—	.0	—
1995	—	1,220.7	—	6.0	9.0	851.0	—	.0	—

Year	Mountain Glen Ranch	Mountain High—Holiday Hill Company	Nakasone Development Company	Nebeker Ranch			Nishimoto, Jimmie M.	Nishimoto, Roy	Oakwood Enterprises	Ordway, Ben
	Ground water	Ground water	Ground water	Ground water	Reclaimed water	Total	Ground water	Ground water	Surface water	Surface water
1992	0.0	0.0	0.0	323.0	3,640.0	3,963.0	0.0	0.0	6.1	29.0
1993	—	0.0	—	259.0	2,997.0	3,256.0	—	—	6.1	29.0
1994	—	0.0	—	286.0	3,711.0	3,997.0	—	—	6.1	29.0
1995	—	0.0	—	240.0	3,226.0	3,466.0	—	—	6.1	29.0

Year	Pablo, Mr. and Mrs. Pastor	Peachland Farms	Piani, Gino	Poncedeleon, Modesto	Portanova	Pratt, Dr. W.H.	Proctor, Carl	Pulsipher Enterprises
	Ground water	Purchased water	Ground water	Purchased water	Purchased water	Ground water	Ground water	Purchased water
1992	0.0	288.0	0.0	6.0	0.0	0.0	0.0	8.0
1993	—	264.0	—	6.0	.0	—	.0	9.0
1994	—	436.0	—	7.0	.0	—	.0	12.0
1995	—	339.0	—	9.0	.0	—	.0	11.0

Year	Punchbowl Canyon Water Association	R and M Ranch, Inc.	RR Ranch	Rabinov, David MD	Rancho Corona Del Valle Corporation	Rancho Vista Development	Reca, Dominique	Retlaw Enterprises Incorporated
	Surface water	Ground water	Purchased water	Ground water	Surface water	Purchased water	Ground water	Ground water
1992	27.5	3,950.0	479.0	0.0	31.5	0.0	0.0	6,914.0
1993	27.5	3,567.0	1,194.0	—	31.5	.0	—	1,500.0
1994	27.5	2,837.0	1,357.0	—	31.5	.0	—	2,250.0
1995	27.5	3,674.0	919.0	—	31.5	.0	—	1,800.0

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Table A2. Water-use information for self-supplied water users in Antelope Valley, California, by water-supply sources, 1992–95—Continued

Year	Ritter and Godde			Robbins, David	Robinson, F. Willard and others	Rosen, Sandee	S&D	Sasland Farms Spivak-Brown
	Ground water	Purchased water	Total	Purchased water	Surface water	Purchased water	Purchased water	Ground water
1992	2,275.1	1,124.0	3,399.1	8.0	—	6.0	0.0	0.0
1993	1,139.3	2,316.0	3,455.3	7.0	—	6.0	.0	—
1994	415.6	2,841.0	3,256.6	6.0	—	1.0	.0	—
1995	1,993.0	2,611.0	4,604.0	8.0	—	4.0	.0	—

Year	Schnaidt, Harold			Searcy, Travis	Seiki Investment Corporation	Silva, Don	Simi, Roy	Southern California Edison Company
	Ground water	Purchased water	Total	Purchased water	Ground water	Purchased water	Purchased water	Gro water
1992	—	65.0	65.0	6.0	0.0	10.0	0.0	10.1
1993	—	56.0	56.0	7.0	—	11.0	.0	11.2
1994	—	81.0	81.0	13.0	—	11.0	.0	12.7
1995	—	68.0	68.0	8.0	—	10.0	.0	.0

Year	Stevens, William E.	Stoner	Sundown Ranch Company	Tapia Brothers	Taunton, Windsor P.	Tejon Ranch			Traweek, S.V.
	Ground water	Purchased water	Ground water	Purchased water	Ground water	Ground water	Purchased water	Total	Ground water
1992	0.0	0.0	0.0	402.0	0.0	1,006.0	–230.0	776.0	0.0
1993	—	.0	—	238.0	—	—	.0	.0	—
1994	—	.0	—	205.0	—	—	.0	.0	—
1995	—	.0	—	795.0	—	—	.0	.0	—

Year	U.S. Forest Service, Angeles National Forest			Union Wilshire Incorporated	Unnamed spring group	Vandereyk	Vaught, Amelia	Wade, Thomas H.	Ward, J.W./Lyman Champlain
	Ground water	Surface water	Total	Ground water	Surface water	Purchased water	Purchased water	Ground water	Ground water
1992	0.0	24	24	0.0	18.1	0.0	6.0	0.0	0.0
1993	—	24	24	—	18.1	.0	6.0	.0	—
1994	—	24	24	—	18.1	.0	7.0	.0	—
1995	—	2.5	2.5	—	18.1	.0	6.0	3.3	—

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Table A2. Water-use information for self-supplied water users in Antelope Valley, California, by water-supply sources, 1992–95—Continued

Year	Weaver	White, J.F. Jr., H.B., and D.B.	White, James B. or Dee Ann	White, Michael G.	White, Richard A.	Williams, Claude	Wilmar Farms	Zamrzla, Johnny
	Purchased water	Surface water	Ground water	Ground water	Ground water	Ground water	Purchased water	Ground water
1992	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0
1993	.0	—	.0	—	.0	—	1,157.6	—
1994	.0	—	.0	—	.0	—	2,139.0	—
1995	.0	—	24.0	—	5.7	—	2,119.0	—

Year	Total			Grand total
	Ground water	Surface water	Purchased water	
1992	29,925.7	888.5	2,692.0	33,506.2
1993	23,015.1	.0	8,690.6	31,705.7
1994	22,437.3	.0	12,833.0	35,270.3
1995	26,613.7	.0	13,447.0	40,060.7

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Table A3. Deliveries of imported water to Antelope Valley from the California Aqueduct, 1992–95

[Units are in acre-feet per year]

Year	Antelope Valley–East Kern Water Agency[1]	Littlerock Creek Irrigation District[2]	Palmdale Water District[3]	Total
1992	27,663	251	3,845	31,759
1993	40,928	735	10,136	51,799
1994	49,536	1,100	8,037	58,673
1995	46,091	480	6,613	53,184

[1]Russell Fuller, Antelope Valley–East Kern Water Agency, written commun., 1998.
[2]Brad Jones, Littlerock Creek Irrigation District, written commun., 1996.
[3]Matt Knudson, Palmdale Water District, written commun., 1996.

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Table A4. Use of reclaimed wastewater in Antelope Valley, California, 1992–95

[Units are in acre-feet. Data from David Lambert (County Sanitation Districts of Los Angeles County, written commun., 1996)]

Year	Lancaster Water Reclamation Plant			Palmdale Water Reclamation Plant		
	Wetlands	Irrigation	Total	Land disposal	Irrigation	Total
1992	3,520	3,640	7,160	6,150	21	6,170
1993	5,280	3,000	8,280	7,080	42	7,120
1994	5,110	3,700	8,810	7,480	51	7,530
1995	7,140	3,225	10,360	8,070	67	8,140

Attachment H

ORG-3H

From: "Imsand, Shirley" <SImsand@planning.lacounty.gov>
To: SPHARRIS@dfg.ca.gov
CC: Ronald_Cummings@URSCorp.com; Crissy_Slaughter@URSCorp.com; MVBReddy@plan...
Date: 1/13/2009 9:21 AM
Subject: RE: Stream and Drainage Protection Measures in LA County General Plan

Scott:

We have this request from URS for streambed setbacks and buffer requirements. The County General Plan and ordinances do not address this, but rely on CA Fish and Game to set requirements. I think you are familiar with this project for URS.

I would like to mention, that Center for Biological Diversity, states that a minimum width allowance for wildlife corridors, which are often in streambeds, should be 1000 ft. or 500 ft. each side of the centerline of the corridor/drainage.

The Lakes CSD is using something like 50 or 100ft. because they are adjusting to what residents want. I remember Commissioner Helsley suggested 100-200 ft., but I think this recommendation fell on deaf ears.

I think we are all wondering what CA Fish and Game does, so when you reply to URS, please copy all of us.

-Shirley

ORG-3H

- - - - - - - - - - - - - - - - - - - -

Shirley Imsand, Ph.D., Senior Biologist

Department of Regional Planning, Los Angeles County

320 Temple Street

Los Angeles, CA 90012

213/ 974-6461 or 213/ 974-4463

fax: 213/ 626-0434

simsand@planning.lacounty.gov

From: Bush, Michele
Sent: Thursday, January 08, 2009 9:31 AM
To: Imsand, Shirley; Reddy, MVB
Subject: FW: Stream and Drainage Protection Measures in LA County General Plan

Attachment I

ORG-3I

Office of Health, Safety and Security

Safety Advisory

No. 2007-01 January 2007

Valley Fever (*coccidiodomycosis*)

Purpose

This Safety Advisory provides information on a health and safety concern that may impact the health of workers at Department of Energy (DOE) facilities, particularly those located in the southwestern United States. Specifically, the concern is the recognition and prevention of a serious respiratory infection called Valley Fever (medical name *coccidioidomycosis*), caused by a fungus common in that part of the country.

Background

Lawrence Livermore National Laboratory recently reported four cases of occupational *coccidioidomycosis*, also known as Valley Fever, in its workforce in 2006. The affected workers included a firefighter, laborer, senior science associate, and an environmental technician, all of whom conducted tasks outdoors as part of their duties. As a result of this illness, these workers lost an average of 64 workdays. The site has increased efforts to prevent exposure and to educate workers about the risks.

Coccidioidomycosis, also called San Joaquin Fever or Valley Fever, is caused by the inhalation of spores from a fungus [*Coccidioides immitis (C. immitis)*] common in soils of the southwestern United States, Mexico, and parts of South America. The fungus thrives in dry conditions in locations with mild winters and long hot seasons. Its spores are released when soil is disturbed by man (for example, by raking or shoveling) or by natural occurrences such as wind. Opportunity for exposure is greatest during the summer months when the soil is dry and dusty. *C. immitis* infection is NOT spread from person to person.

Since the 1990s, the occurrence of Valley Fever has been increasing, particularly in Arizona and California. Recent research also suggests that the disease may be becoming more widespread geographically.

Occupational Hazards

- Disturbance of the soil can aerosolize *C. immitis* spores, thereby increasing exposure, which results in Valley Fever outbreaks.
- Working in dusty areas or under windy conditions that spread the spores can increase exposure. In areas where *C. immitis* occurs naturally, windy conditions can spread the spores. Workers should be made aware of the potential for an increased risk of exposure.
- Occupations involving work performed in dusty areas such as construction, road building, landscaping, excavation, mining, geology, and military maneuvers are at higher risk.

Other Risk Factors

Research has shown that other, non-occupational risk factors also can increase the risk of Valley Fever or more serious health effects from *C. immitis* infection:

- Smokers are at higher risk.
- People of color appear to be at higher risk for Valley Fever than are whites, and are more likely to develop serious illness if infected.
- Pregnant women are more susceptible to infection.
- People with diabetes are more susceptible to infection.
- Anyone with a weakened immune system, such as individuals with HIV/AIDS, and individuals undergoing chemotherapy or organ transplant patients.
- Older individuals are more susceptible than younger people.

Common Symptoms

Once inhaled, *C. immitis* spores are able to go deep into the lungs, where they reproduce and cause disease. The severity of disease is, to some extent, related to the number of spores inhaled.

- Valley Fever symptoms are often described as "flu-like."
- Common symptoms of infection include:
  - > Difficulty breathing
  - > Fever
  - > Dry cough
  - > Fatigue
  - > Shortness of breath
  - > Muscle aches
  - > Skin rash
  - > Weight loss
- Symptoms may appear 1 to 3 weeks after infection

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For further information on this Safety Advisory, contact Bonnie Richter at (301) 903-4501

- About 60 percent of individuals infected with *C. immitis* experience no noticeable symptoms.
- In about 1 percent of those infected, the spores spread beyond the lungs and can produce more serious disease.

TREATMENT

- A diagnosis of Valley Fever can be confirmed by blood tests measuring the level of antibodies to *C. immitis*. Chest X-rays are also useful.
- Most cases of acute Valley Fever resolve on their own and do not require treatment.
- For more serious cases, antifungal medications treat fungal infections throughout the body by slowing the growth of the fungi that are causing the infection.
- Hospitalization or bed rest may be necessary in serious cases.
- No vaccine is available to prevent the disease, but *C. immitis* infection confers long-term immunity to subsequent infection.

CONTROLLING VALLEY FEVER

Given the widespread occurrence of *C. immitis* in much of the southwestern U.S. and the ease with which the spores can become airborne, complete prevention of exposure is not feasible. Prevention of *C. immitis* infection is desirable; an acute infection can result in an average absence from work of over 30 days. A number of actions can be taken on the worksite to reduce the risk of infection, including:

- Minimizing soil disturbance
- Wetting down soil in work areas prior to initiating tasks, and repeated wetting as needed to minimize dust
- Wearing NIOSH-approved N95 respirators or equivalent respiratory protection at the work site to reduce inhalation risk
- Establishing an appropriate respiratory protection program that meets the OSHA Respiratory Protection Standard (29 CFR 1910.134)
- Increase health surveillance in high-risk areas to enhance the likelihood of early detection
- Holding employee informational briefings and posting warnings/reminders to raise worker awareness
- Including the consideration of wind and dust conditions in work planning and hazard assessment

ADDITIONAL SOURCES OF INFORMATION

- Your site occupational medicine clinic
- Morgan J. *Coccidioidomycosis*. Atlanta GA: Centers for Disease Control. Available at CDC website.

SUMMARY

- *C. immitis* and Valley Fever are endemic in the southwestern United States.
- Taking action to minimize soil disturbance and dust inhalation may reduce exposure.
- Increased employee awareness is a goal.
- Evaluation of environmental conditions before conducting work and use of proper respiratory protection are recommended.

ORG-3I

ORG-3J

Attachment J

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ROUNDUP® ORIGINAL Herbicide

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: ROUNDUP® ORIGINAL Herbicide
MSDS NUMBER: S00012114
DATE: November, 1997
EPA Reg. No.: 524-445
MONSANTO COMPANY, 800 N. LINDBERGH BLVD., ST. LOUIS, MO 63167
FOR MEDICAL EMERGENCY CALL (collect calls accepted): 314-694-4000
FOR CHEMICAL EMERGENCY, SPILL LEAK, FIRE, EXPOSURE, OR ACCIDENT Call CHEMTREC - Day or Night - 1-800-424-9300 Toll free in the continental U.S., Hawaii, Puerto Rico, Canada, Alaska, or Virgin Islands. For calls originating elsewhere: 703-527-3887 (collect calls accepted)
For additional non-emergency information, call: 800-332-3111

2. COMPOSITION/INFORMATION ON INGREDIENTS

COMPONENT	CAS NO.	% BY WEIGHT
Active Ingredient:		
Glyphosate, N-(phosphonomethyl)glycine, in the form of its isopropylamine salt	1071-83-6	41.0
Inert Ingredients:		59.0
		100.0
Inert Ingredient Component		
Ethoxylated Tallowamines *	61791-83-6	

* - Hazardous chemical under the criteria of the OSHA Hazard Communication Standard (29 CFR 1910.1200).
See Section 8 for exposure limits.

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW
APPEARANCE AND ODOR: Clear, viscous amber-colored solution
WARNING STATEMENTS:
Keep out of reach of children.
WARNING! AVISO!
Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand the label, find someone to explain it to you in detail.)
CAUSES SUBSTANTIAL BUT TEMPORARY EYE INJURY
HARMFUL IF SWALLOWED OR INHALED
REFORMULATION IS PROHIBITED
SEE INDIVIDUAL CONTAINER LABEL FOR REPACKAGING LIMITATIONS
POTENTIAL HEALTH EFFECTS
LIKELY ROUTES OF EXPOSURE: Skin contact and inhalation
EYE CONTACT: ROUNDUP® ORIGINAL Herbicide may cause pain, redness and tearing based on toxicity studies.
SKIN CONTACT: ROUNDUP® ORIGINAL Herbicide is no more than slightly toxic and no more than slightly irritating based on toxicity studies.
INGESTION: ROUNDUP® ORIGINAL herbicide is no more than slightly toxic based on toxicity studies. No significant adverse health effects are expected to develop if only small amounts (less than a mouthful) are swallowed. Ingestion of similar formulations has been reported to produce gastrointestinal discomfort with irritation of the mouth, nausea, vomiting and diarrhea. Oral ingestion of large quantities of one similar product has been reported to result in hypotension and lung edema.
INHALATION: ROUNDUP® ORIGINAL Herbicide is no more than slightly toxic if inhaled based on toxicity studies.
MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: None known.
Refer to Section 11 for toxicological information.

4. FIRST AID MEASURES

IF IN EYES: Immediately hold eyelids open and flush with plenty of water. Get medical attention.
IF ON SKIN: Immediate first aid is not likely to be required. However, this material can be removed with soap and water. Wash heavily contaminated clothing before reuse.
IF INHALED: Remove individual to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. Get medical attention
IF SWALLOWED: This product will cause gastrointestinal tract irritation. Immediately dilute by swallowing water or milk. Get medical attention
NOTE: For additional human emergency first aid or treatment guidance, call collect, anytime, day or night (314) 694-4000.

5. FIRE FIGHTING MEASURES

FLASH POINT: None
METHOD: Pensky-Mariens
AUTOIGNITION TEMPERATURE: Not determined.
HAZARDOUS PRODUCTS OF COMBUSTION: CO2, CO, NOx
EXTINGUISHING MEDIA: In case of fire, use water (flood with water), dry chemical, CO2, or alcohol foam.
UNUSUAL FIRE AND EXPLOSION HAZARDS: None
FIRE FIGHTING EQUIPMENT: Fire fighters and others exposed to products of combustion should wear self-contained breathing apparatus. Equipment should be thoroughly decontaminated after use.

6. ACCIDENTAL RELEASE MEASURES

Contain large spills with dikes and transfer the material to appropriate containers for reclamation or disposal. Absorb remaining material or small spills with an inert material and then place in a chemical waste container. Flush residual spill area with water.
Large spills that soak into the ground should be dug up, placed in metal drums and disposed of in accordance with instructions provided under DISPOSAL, Section 13 of this MSDS. Contact appropriate state agency when considering a land spreading disposal option.
Leaking containers should be separated from non-leakers and either the container or its contents transferred to a drum or other non-leaking container and disposed of in accordance with instructions provided under DISPOSAL, Section 13 of this MSDS. Any recovered spilled liquid should be similarly collected and disposed of.

7. HANDLING AND STORAGE

HANDLING: Do not get in eyes or on clothing. Avoid breathing vapor or spray mist. Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet. Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing. Do not apply directly to water, to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment washwaters. Emptied container retains vapor and product residue. Observe all labeled safeguards until container is cleaned, reconditioned, or destroyed. **DO NOT REUSE THIS CONTAINER.**
Spray solutions of this product should be mixed, stored or applied using only stainless steel, aluminum, fiberglass, plastic or plastic-lined containers.
DO NOT MIX, STORE OR APPLY THIS PRODUCT OR SPRAY SOLUTIONS OF THIS PRODUCT IN GALVANIZED OR UNLINED STEEL (EXCEPT STAINLESS STEEL) CONTAINERS OR SPRAY TANKS. This product or spray solutions of this product react with such containers and tanks to produce hydrogen gas that may form a highly combustible gas mixture. This gas mixture could flash or explode, causing serious personal injury, if ignited by open flame, spark, welder's torch, lighted cigarette or other ignition source.
STORAGE: Product is stable under normal conditions of storage and handling for at least 5 years. Store in a cool, well-ventilated place away from foodstuffs, reducing agents and acids.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

EYE PROTECTION: Wear chemical splash goggles during mixing/pouring operations or other activities in which eye contact with undiluted ROUNDUP® ORIGINAL Herbicide is likely to occur.
SKIN PROTECTION: Wear appropriate protective clothing to prevent skin contact. Applicators and other handlers must wear long-sleeved shirt, long pants, shoes plus socks and protective eyewear. Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.
RESPIRATORY PROTECTION:
For Handling of the Undiluted Product: Undiluted ROUNDUP® ORIGINAL Herbicide is not likely to be present an airborne exposure concern during normal handling. If there is an accidental discharge of the material during manufacture or handling that produces a heavy vapor or mist, workers should use NIOSH/MSHA approved equipment. In work situations where an air purifying respirator is appropriate to be used, use of a full face respirator equipped with purifying elements for protection against organic vapor and dust/mist approved for pesticides is recommended. Use cartridges with MSHA/NIOSH approval number TC-23C or canister with MSHA/NIOSH approval number TC-14G. Full facepiece replaces the need for chemical goggles. Observe respirator use limitations specified by the manufacturers. Respiratory protection programs must comply with 29 CFR §1910.134.
For Application of Product Diluted in accordance with label instructions: Respirators are not required for applications of use - dilution's of ROUNDUP® ORIGINAL Herbicide.
VENTILATION: No special precautions are recommended.
AIRBORNE EXPOSURE LIMITS:

PRODUCT/COMPONENT	OSHA PEL	ACGIH TLV
ROUNDUP® ORIGINAL Herbicide	Not established	Not established
Ethoxylated Tallowamine	Not established	Not established

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: clear, viscous amber-colored solution
Odor: practically odorless to slight amine-like odor
pH: 4.7 (1% solution)
Specific Gravity: 1.17 @ 25/25 degrees C
NOTE: These physical data are typical values based on material tested but may vary from sample to sample. Typical values should not be construed as a guaranteed analysis of any specific lot or as specifications for the product.

10. STABILITY AND REACTIVITY

STABILITY: Product is stable under normal conditions of storage and handling. Store in a cool, well-ventilated place away from foodstuffs, reducing agents and acids.
MATERIALS TO AVOID: Acids and bases.
HAZARDOUS DECOMPOSITION PRODUCTS: None
HAZARDOUS POLYMERIZATION: Does not occur. This product can react with caustic (basic) materials to liberate heat. This is not a polymerization but rather a chemical neutralization in an acid base reaction.

11. TOXICOLOGICAL INFORMATION

Data from laboratory studies conducted by Monsanto with ROUNDUP® ORIGINAL Herbicide are summarized below:
Single exposure (acute) studies indicate:
Oral - Practically Non-toxic (Rat LD_{50}, >5,000 mg/Kg); FIFRA Category IV
Dermal - Practically Non-toxic (Rabbit LD_{50}, >5,000 mg/Kg); FIFRA Category IV
Inhalation - Slightly toxic (Rat 4-hr LC_{50}, - 2.6 mg/L); FIFRA Category III
Eye Irritation - Rabbits (6); 24-hr exp.; Slight to Moderate Irritation, Eye irritation was evident at day 14 but cleared by day 21 after exposure in 1 animal; FIFRA Category II; EC: Corneal Opacity - 0.0, Iris - 0.0, Erythema - 1.7, Chemosis - 0.8

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Skin Irritation - Rabbits (6); 4-hr exp.; Essentially Non-irritating; Slight erythema (redness) clearing in all animals within 24 hours; FIFRA Category IV; EC: Erythema - 0.0, Edema-0.0

No skin allergy was observed in guinea pigs following repeated skin exposure.

COMPONENTS

Data from laboratory studies conducted by Monsanto and from the scientific literature on components of ROUNDUP® ORIGINAL Herbicide:

Isopropylamine Salt of Glyphosate

Data from studies with a formulation comprised of 62% isopropylamine salt of glyphosate (MON 0139) indicate the following:

In repeat dosing studies (6-month), dogs fed MON 0139 exhibited slight body weight changes. Following repeated skin exposure (3-week) to MON 0139, skin irritation was the primary effect in rabbits.

Additional toxicity information is available on glyphosate, the active herbicidal ingredient of MON 0139. Following repeated exposures (90-days) to glyphosate in their feed, decreased weight gains were noted at the highest test level in mice, while no treatment-related effects occurred in rats. Following repeated skin exposure (3 weeks) to glyphosate, slight skin irritation was the primary effect observed in rabbits. No skin allergy was observed in guinea pigs following repeated skin exposure. There was no evidence of effects on the nervous system, including delayed effects in chickens (repeat oral doses) or cholinesterase inhibition in rats (single oral doses). Reduced body weight gain and effects on liver tissues were observed with long-term (2-year) feeding of glyphosate to mice at high-dose levels. Reduced body weight gain and eye changes were observed at the high-dose level in one long-term (2 year) feeding study with rats, while no treatment-related effects occurred in a second study. No adverse effects were observed in feeding studies with dogs. Glyphosate did not produce tumors in any of these studies. **Based on the results from the chronic studies, EPA has classified glyphosate in category E (evidence of non-carcinogenicity for humans).** No birth defects were noted in rats and rabbits given glyphosate orally during pregnancy, even at amounts which produced adverse effects on the mothers. Glyphosate was fed continuously to rats at very high dose levels for 2 successive generations. Toxicity was reported in offspring from the high dose, a level which also produced adverse effects on the mothers. In a 3 generation study conducted at lower dose levels, no effects were seen on the ability of male or female rats to reproduce. Glyphosate has produced no genetic changes in a variety of standard tests using animals and animal or bacterial cells.

Ethoxylated Tallowamine

The surfactant component of ROUNDUP® ORIGINAL Herbicide is reported to cause irritation to the eyes and skin and may contribute to the irritation potential reported for this herbicide. Ingestion may produce gastrointestinal irritation, nausea, vomiting and diarrhea.

12. ECOLOGICAL INFORMATION

ROUNDUP® ORIGINAL Herbicide has been shown to be slightly to moderately toxic in aquatic studies. ROUNDUP® ORIGINAL Herbicide has been shown to be practically non-toxic to avian species following subacute dietary exposure.

Rainbow Trout 96-hr LC_{50}	22 mg/L (static)	Fathead minnow 96-hr LC_{50}	9.4 mg/L
Rainbow Trout 96-hr LC_{50}	8.2 mg/L (dynamic)	Channel catfish 96-hr LC_{50}	16 mg/L
Daphnia Magna 48-hr LC_{50}	37 mg/L (aeration)	Chinook Salmon 96-hr LC_{50}	20 mg/L
Daphnia Magna 48-hr LC_{50}	24 mg/L (without aeration)	Coho Salmon 96-hr LC_{50}	22 mg/L
Bluegill Sunfish 96-hr LC_{50}	5.8 mg/L (dynamic)	Algae S. Capricornutum 72-hr EC_{50}	2.1 mg/L
Bluegill Sunfish 96-hr LC_{50}	14 mg/L (static)	Bobwhite Quail 8-day LC_{50}	> 6300 ppm
Gammarus pseudolimnaeus 48-hr EC_{50}	42 mg/L	Mallard Duck 8-day LC_{50}:	>6300 ppm

13. DISPOSAL CONSIDERATIONS

Wastes resulting from the use of this product that cannot be used or chemically reprocessed should be disposed of in a landfill approved for pesticide disposal or in accordance with applicable Federal, state or local procedures.

Emptied container retains vapor and product residue. Observe all labeled safeguards until container is cleaned, reconditioned or destroyed. DO NOT CUT OR WELD ON OR NEAR THIS CONTAINER.

Metal Drums: Triple rinse container. Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities.

Metal Bulk: Triple rinse emptied bulk containers. Then offer for recycling or reconditioning or disposal in a manner approved by state and local authorities.

Plastic Drums and mini bulk: Do not reuse container. Return container per the Monsanto container return program.

If not returned, triple rinse container, then puncture and dispose of in a sanitary landfill, or by incineration, or, if allowed, by state and local authorities, by burning. If burned, stay out of smoke.

14. TRANSPORT INFORMATION

Follow the precautions indicated in the Handling and Storage Section, Section 7 of this MSDS.

DOT Proper Shipping Name: Not Applicable

DOT Hazard Class/I.D. No.: Not Applicable

DOT Label: Not Applicable

U.S. Surface Freight Classification: Weed killing compound, N.O.I.B.N.

15. REGULATORY INFORMATION

SARA Hazard Notification:

Hazard Categories Under Criteria of SARA Title III Rules (40 CFR Part 370): Immediate

Section 313 Toxic Chemical(s): Not Applicable

Reportable Quantity (RQ) under U.S. CERCLA: Not Applicable

TSCA Inventory: All components are on the US EPA's TSCA Inventory List

16. OTHER INFORMATION

REASON FOR REVISION: New

Supersedes MSDS dated: New

ROUNDUP® is a registered trademark of Monsanto Company

This Material Safety Data Sheet (MSDS) serves different purposes than and DOES NOT REPLACE OR MODIFY THE EPA-APPROVED PRODUCT LABELING (attached to and accompanying the product container). This MSDS provides important health, safety, and environmental information for employers, employees, emergency responders and others handling large quantities of the product in activities generally other than product use, while the labeling provides that information specifically for product use in the ordinary course.

Use, storage and disposal of pesticide products are regulated by the EPA under the authority of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) through the product labeling, and all necessary and appropriate precautionary, use, storage, and disposal information is set forth on that labeling. It is a violation of federal law to use a pesticide product in any manner not prescribed on the EPA-approved label.

Although the information and recommendations set forth herein (hereinafter "Information") are presented in good faith and believed to be correct as of the date hereof, Monsanto Company makes no representations as to the completeness or accuracy thereof. Information is supplied upon the condition that the persons receiving same will make their own determination as to its suitability for their purposes prior to use. In no event will Monsanto Company be responsible for damages of any nature whatsoever resulting from the use of or reliance upon Information. NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OF ANY OTHER NATURE ARE MADE HEREUNDER WITH RESPECT TO INFORMATION OR THE PRODUCT TO WHICH INFORMATION REFERS.

ROUNDUPORIGINAL.n97.doc

ORG-3J

4.5 INDIVIDUALS

Comment letters from individuals and corresponding Written Responses to Comments follow for the following Individual (I) letters:

- Shizuko Hill (I-1)
- Ponciano Manalo (I-2)
- L. Dean Webb (I-3)
- Several Residents of Antelope Acres (I-4)

Written Responses to Shizuko Hill (I-1)

Response I-1-1:

Commenter inquires whether their approximately 2.5-acre property (Tract No. 29386 Lot 52) is located within the Project area. Based on the property tract information provided, the commenter's subject property is located along 172nd Street West, just south of Avenue A-8, and is not located within the Project site.

I-1

6-21-2010

RECEIVED
JUN 25 2010

Christina

DEPT of Regional Planning
IMPACT ANALYSIS ROOM 1348
320 WEST TEMPLE STREET
LOS ANGELES, CA. 90012

Dear Christina

We need your expert advise and help. Is our 2½ acres, we purchased in 1975, Included in the proposed site Location of AV Solar Ranch One?

On the Property TAX bill the assessor's ID# 15 3257 021 020 09000. Property location & description is VAC/COR VA AVO 172 STW FAIRMONT TRACT NO 29386 LOT 52. also, the purchase was Recorded in L.A. County Recorder's Office in Book 805 page 29 to 37

We ask your help because we are unable to ascertain if we are or are not, included in the project.

I-1-1

Thank you Sincerely for your help in this matter.

Shizuko Hill

FROM: SHIZUKO HILL
433 SMILAX AVE
WEST SACRAMENTO, CA. 95605

PHONE # 916-372-1401

Written Responses to Ponciano Manalo (I-2)

Response I-2-1:

Comment states the location of his property. Refer to Response I-2-2.

Response I-2-2:

Based on the property track information provided, the commenter's property is adjacent to the west side of 170th Street West, just north of West Avenue A-8, and is more than 1 mile north of the Project site. The proposed Project transmission line would be located within the public road right of way on the east side of 170th Street West in this area. The Draft EIR analyzes environmental impacts to the existing physical conditions at the time the Notice of Preparation was published (April 29, 2009), which included consideration for existing residences near the commenter's subject property, as shown on Figure 3-1 of the Draft EIR. Based on the impact analysis and identified mitigation measures presented in the Draft EIR, the proposed Project (facility site and transmission line) would result in less than significant impacts to environmental resources to the Project area and adjacent and nearby areas.

From: Pons&Helen Manalo [phelman1@yahoo.com] **Sent:** Monday, June 21, 2010 5:29 PM **To:** Tran, Christina **Subject:** Re: Lot #80 of Tract #29386

I-2

Dear Ms.Tran,

My name is Ponciano B. Manalo, owner of Lot #80 of Tract #29386, per map recorded in Book 805, Pages 29 thru 37 in the County Recorder's Ofiice. The lot is located between Avenue A and Avenue B, bordering 170 th St. West. I-2-1

I want to know if this lot is included in the AV SOLAR RANCH ONE PROJECT per the receipt of tour letter. If it is included, will you be paying me for the value of the land? And if it is outside the proposed procject, what will be the effect of this project to the property, since the said property is in the vicinity? -2

Please clarify this matter to me and my wife. Your prompt response will be highly apprciated.

Thank you.

Pons Manalo

Written Responses to L. Dean Webb (I-3)

Response I-3-1:

Commenter states that comments are in most part positive on the Project: using disturbed soil and employing photovoltaic technology (low water usage) as a power source are both positive; and the effects on the nearby California Poppy Reserve will not have much in the way of visual and sound impacts. No response is required. However, the comment is acknowledged for the record and will be forwarded to the decision-making bodies for their review and consideration.

Response I-3-2:

This comment expresses an opinion that combining Alternatives 2 and 3 would result in the best environmental project, but does not state a specific concern or question regarding the adequacy of the analysis contained in the Draft EIR. Therefore, a response is not required pursuant to CEQA. However, the comment is acknowledged for the record and will be forwarded to the decision-making bodies for their review and consideration.

Response I-3-3:

The comment makes several recommendations for the purchase and protection of lands; all of which have been identified in biological resources Mitigation Measure 5.7-2 (Off-site Mitigation for Loss of Habitat, as modified; see Section 2.0, Revisions to the Draft EIR in this Final EIR) in Section 5.7.5 of the Draft EIR. As stated in Mitigation Measure 5.7-2, mitigation land shall be acquired and preserved in the vicinity of the Antelope Valley California Poppy Reserve, lands connecting the Poppy Reserve to the Angeles National Forest, or lands in or adjacent to SEA #57 or SEA #60.

Response I-3-4:

Refer to Response ORG-1-3.

Response I-3-5:

Refer to Response ORG-1-2 and ORG-1-4. As discussed in Draft EIR Section 5.10 (Visual Qualities), the Project would not impact recreation, would maintain panoramic vistas, and would result in less than significant impacts to visual resources. The Project site is privately-owned property that is zoned Heavy Agriculture (A-2), and is not designated as open space. As described in the Draft EIR, the Project would not remove Joshua trees and requires protection of Joshua trees (refer to Draft EIR Mitigation Measure 5.7-1, as modified; see Section 2.0, Revisions to the Draft EIR of this Final EIR), and mitigates for loss of wildflower fields by preserving and enhancing (where applicable) off-site mitigation lands

including a minimum of 224.5 acres of wildflower habitat (refer to Draft EIR Mitigation Measure 5.7-2, Offsite Mitigation for Loss of Habitat). Additionally, the Project site does not contain nor is located within the vicinity of a regional wildlife corridor, as assessed and analyzed in Draft EIR Sections 5.7.2.1.5 and 5.7.3.2.6. However, as described in Draft EIR Section 5.7.3.2.6, the facility site would be installed with wildlife-permeable fencing to allow small and medium-sized wildlife species to continue to move within and through the site to satisfy biological requirements. The Project is not located within an SEA, and incorporates design measures and mitigation measures (as described in Draft EIR Section 5.7.3.2.7) such that the Project would have less than significant effects on nearby SEAs.

Response I-3-6:

Comment states that the commenter has written several letters and emails to the Planning Commission and to Supervisor Antonovich on attempting to develop a type of a co-operative set of County plans for maintaining open space elements, and still have solar and wind facilities on the "west side." This comment does not state a specific concern or question regarding the adequacy of the analysis contained in the Draft EIR. Therefore, a response is not required pursuant to CEQA. However, the comment is acknowledged for the record and will be forwarded to the decision-making bodies for their review and consideration.

Response I-3-7:

The commenter refers to a bill on renewable energy signed by the Governor of California, which established a revolving fund paid for by project-assessed fees, which will be used to purchase private lands for habitat restoration and for offsetting impacts from construction. Commenter suggests that the Project "should seek some of this funding and work with the local town councils along with land conservancies, developers, CA State Parks and LA County and others, to protect some of the remaining wildflower visits and Joshua tree woodlands in the western part of the Antelope Valley." This comment does not state a specific concern or question regarding the adequacy of the analysis contained in the Draft EIR. Therefore, a response is not required pursuant to CEQA. However, the comment is acknowledged for the record and will be forwarded to the decision-making bodies for their review and consideration.

I-3

From: LDWEBBO@aol.com
Sent: Friday, July 23, 2010 9:27 PM
To: Tran, Christina
Cc: LDWEBBO@aol.com
Subject: DEIR - AV Solar Ranch One

July 26, 2010

TO: Christina Tran
Los Angeles County
Department of Regional Planning
Impact Analysis Section, Room 1348
320 West Temple Street,
Los Angeles, CA 90012
(213) 974-6461
ctran@planning.lacounty.gov

SUBJECT: DEIR for AV Solar Ranch One Project (Formerly NextLight) ---
County Project NO. R2009-02239

From: L. Dean Webb, Member of the Antelope Valley Environmental Group (AVEG) and the AV Group of the Sierra Club.

1000 E. Caperton
Lancaster, CA., 93535

eMail < ldwebbo@aol.com >

TO: Christina Tran and the LA County Regional Planners and Staff.

My comments are in most part positive on this project. Using disturbed soil and employing photovoltaic technology (low water usage) as a power source are both positive ways for this type of facility. The effects on the nearby California Poppy Reserve will not have much in the way of visual or sound impacts. Combining Alternatives two and three would result in the best environmental project. I feel that "AV Solar Ranch One" should take on the task of protecting SEA 60 to the north and the areas around its southern boundary where they are poppy fields and SEA 57 lies nearby. Development in these undisturbed parcels should be discouraged and the land purchased if possible. I-3-1 -2 -3

My concerns are from the "cumulative environmental effects" of this project in addition to the many other proposed solar and wind farms in the area around the Poppy Reserve plus a proposed racetrack about a half-mile to the west. These developments will spawn additional street traffic, noise and small business along the local paved roads. -4

I feel the west Antelope Valley (AV) is at a "tipping point". Not any one of these developments is a bad concept alone but when combined a need exists for a joint co-operative association to mitigate and help maintain areas of the remaining open space elements in the western AV for Joshua trees, wildflowers, recreation (hiking and bicycling), wildlife corridors, panoramic vistas and County SEA's. -5

I have written several letters and emails to the Planning Commission and to Supervisor Antonvich on attempting to develop some type of a co-operative set of County plans for maintaining these open space elements, and still have solar and wind facilities on the west side. Using mitigated lands acquired from solar and wind developments, a general plan for maintaining the west AV and still have growth is possible. -6

In March of this year the Governor of California signed a bill on renewable energy which established a revolving fund paid for by project - assessed fees, which will be used to purchased private lands for habitat restoration and for offsetting impacts from construction. AV Solar Ranch One should seek some of this funding and work with the local town councils along with land conservancies, developers, CA State Parks and LA County and others, to protect some of the remaining wildflower visits and Joshua tree woodlands in the western part of the Antelope Valley. I hope these concepts will be reviewed, modified and implement. -7

ORG-2

L. Dean Webb, Member of "AVEG" and the "AV Group of the Sierra Club".
1000 E. Caperton,
Lancaster, CA., 93535

eMail < ldwebbo@aol.com >

Written Responses to Several Residents of Antelope Acres (I-4)

Response I-4-1:

Comment states that as long time residents of the community of Antelope Acres, the four residents support the idea of solar panels to generate electricity at individual sites like homes and businesses. The commenters state that they cannot approve, however, of huge solar projects that take up thousands of acres of open space land envisioned by their community for other uses. This comment does not state a specific concern or question regarding the adequacy of the analysis contained in the Draft EIR. Therefore, a response is not required pursuant to CEQA. However, it should be noted that the proposed Project would produce utility-scale electricity, which is not feasible on homes or businesses. The Project site is a privately-owned property zoned Heavy Agriculture (A-2), and is not designated as open space. This comment is acknowledged for the record and will be forwarded to the decision-making bodies for their review and consideration.

Response I-4-2:

Comment states that the Project site is located within an agricultural opportunity area containing a California State Park Reserve and numerous species of wildlife that have become increasing rare in Los Angeles County due to development. Comment further states that the construction of power lines, solar panels, generating buildings, switching stations, etc. will create land use conflicts with adjacent agricultural lands and the existing community (Town and Country Policy COS 10.5). Commenter also states that landowners are already complaining and upset about the potential loss of value of their property and loss of open space.

The Project involves construction of an Operations and Maintenance (O&M) building with no generating equipment and electrical substation as discussed in DEIR Section 4.4 (Project Characteristics). The Draft EIR identifies the Project area to be located in a designated Agricultural Opportunity Area in Section 5.9.2.1, and Table 5.16-1 addresses the Project consistency with Agricultural Opportunity Areas. As discussed in DEIR Table 5.16-1 the Project is not an urban or suburban use and the Project would generate electrical power in a passive manner. The construction of the Project, as mitigated, and operation of the Project would result in less than significant air emissions, traffic, and noise, and would not affect adjacent agricultural operations, therefore, the Project is consistent with the Agricultural Opportunity Areas policies in the County's Antelope Valley Area Wide Plan. As discussed in the DEIR, including Section 5.10 (Visual Qualities), the Antelope Valley California Poppy Reserve and the Arthur B. Ripley Desert Woodland State Park are located approximately 1.5 and 2.5 miles southeast and southwest, respectively, from the closest edge of the Project site. Given the distance between the Project site and these two closest State parks as well as

intervening topography, the potential Project impacts of possible concern for these State parks are limited to visual impacts. As discussed in DEIR Section 5.10.3.5.2, Project impacts were found to be less than significant for both of these State parks. As discussed in DEIR Section 5.7, the Project would result in less than significant impacts to biological/wildlife resources at the Project site and in the Project region with implementation of mitigation measures.

The comment references draft Policy COS 10.5 from LACDRP's Antelope Valley Area Plan Update Program Draft Goals and Policies (May 2010). Policy COS 10.5 is in draft form for public review, and provides the County to "ensure that all large-scale renewable energy facilities, such as solar farms and wind farms, do not create land use conflicts with adjacent agricultural lands or existing communities in the vicinity." While the draft policy has not yet been adopted, the Draft EIR analyzes the Project's consistency with land use with respect to adjacent agricultural lands and the existing community in Section 5.16 (Land Use), and determines that the Project would result in less than significant impacts to conflicts with land use.

Response I-4-3:

Commenter states that landowners are already complaining and upset about the potential loss of value of their property and loss of open space. The commenters' concern regarding potential loss of property value would be speculative to ascertain, and does not pertain to the adequacy of the Draft EIR. Therefore, a response is not required pursuant to CEQA. However, it should be noted that the proposed Project does not involve loss of open space zoned or land use designated property (the Project site zoning is Heavy Agriculture [A-2]). This comment is acknowledged for the record and will be forwarded to the decision-making bodies for their review and consideration.

Response I-4-4:

The comment states that solar and wind generating plants are being directed to an area that would be completely changed by their presence. The Project as described in the Section 5.16.2.1 of the Draft EIR is located on Heavy Agriculture (A-2) zoned land with a Non-Urban (N1) land use designation (Antelope Valley Area Plan of the Los Angeles County General Plan). As discussed in the DEIR, the Project would be permitted through issuance of a conditional use permit, as provided by the County Zoning Ordinance Section 22.24.150. The Heavy Agriculture zoning allows for a multitude of non-agricultural uses by right and through issuance of a conditional use permit, including residential, commercial, and industrial uses. The Project was not directed to be located at the Project area, but was proposed on the subject property for the reasons detailed in Draft EIR Section 4.1.2. The Project, as analyzed and implemented with on-site and off-site mitigation measures identified

in the Draft EIR, would result in less than significant direct and cumulative impacts to change of character, land use, agricultural resources, visual qualities, biological resources, traffic and access, air quality and the balance of environmental resource areas analyzed in the Draft EIR. As a result, no further mitigation measures are required.

Response I-4-5:

The comment expresses the desire to gain concrete investments from the applicant that would benefit all the citizens of Antelope Acres, but does not state a specific concern or question regarding the adequacy of the analysis contained in the Draft EIR. Therefore, a response is not required pursuant to CEQA. However, the comment is acknowledged for the record and will be forwarded to the decision-making bodies for their review and consideration.

Response I-4-6:

As discussed in Responses I-4-2 through I-4-4, the proposed Project would result in less than significant direct and cumulative impacts to the Project area, with implementation of mitigation measures identified in the Draft EIR. As described in Draft EIR Section 5.16.3.2.2 (Land Use), the Project, as conditioned by the County through a conditional use permit would be consistent with the property's zoning. As a result the Project would be a compatible use with the Project area, including adjacent properties, and would result in less than significant impacts to environmental resources. Therefore, the County respectfully disagrees with the comment's assertion regarding Project-related loss in quality of life.

30 July, 2010

Christia Tran
Los Angeles County Regional Planning

Re: AV Solar Ranch 1 LLC (AV Solar)
Project No. R2009-002239

As long time residents of the community of Antelope Acres, we support the idea of solar panels to generate electricity at individual sites like homes and businesses. We cannot approve, however, of huge solar projects that take up thousands of acres of open space land envisioned by our community for other uses. I-4-1

This is an agricultural opportunity area containing a California State Park Reserve and numerous species of wildlife that have become increasing rare in Los Angeles County due to development. The construction of power lines, solar panels, generating buildings, switching stations, etc. will create land use conflicts with adjacent agricultural lands and the existing community (Town and Country Policy COS 10.5). -2 Landowners are already complaining and upset about the potential loss of value of their property and loss of open space. -3

Since the solar/wind electrical generating plants are being directed to an area that would be completely changed by their presence, we feel that AV Solar should be directed to provide something to make up for the transformation of land intended for agricultural lifestyle. -4

The Antelope Acres Town Council supported AV Solar, not realizing there will be nothing in return. As far as we know, AV Solar has not sat down with the Town Council to negotiate any concrete investment for the duration of their stay that would benefit all the citizens of Antelope Acres. Before the project begins, the county could direct AV Solar to approve an agreement. Some considerations to be agreed on are: -5

- Acquisition of land to be added to the Poppy Reserve
- Acquisition of Little Buttes land for a future preserve

- Building and maintenance of 170th Street West Area-wide trail
- Donate to the Antelope Acres Community Center projects such as providing scholarships
- Give grants for solar systems to community facilities
- Other items to be discussed

-5

An agreement in writing between Los Angeles County Planning and AV Solar could be worked out to make up for the loss of quality of life we once expected to find here.

-6

Thank you very much for supporting our community.

Sincerely,

Virginia Stout

Robert Kerekes

Robin Seybold

Judith Fuentes (contact person)
661-723-1882
47458 92nd Street West
Antelope Acres, CA 93536

SECTION 5.0
MITIGATION MONITORING AND REPORTING PROGRAM

This section presents the Mitigation Monitoring and Reporting Program for the AV Solar Ranch One Project.

MITIGATION MONITORING AND REPORTING PROGRAM[1,2]
PROJECT NO. R2009-02239

Mitigation Measures	Action Required	Mitigation Timing	Responsible Agency or Party	Monitoring Agency or Party
GEOTECHNICAL HAZARDS				
MM 5.2-1: Implementation of Geotechnical Engineering Report Recommendations. The design and construction of the Project shall comply with applicable building codes and standards (e.g., CBC) as well as the recommendations in the geotechnical engineering report (Terracon 2009) to the satisfaction of the Los Angeles County Department of Public Works.	Regular plan check and Site inspection	Prior to issuance of grading permit(s) and During construction	Applicant/Construction Manager	LACDPW
FLOOD HAZARDS				
MM 5.3-1: Erosion Control and Stormwater Management Measures. In order to ensure that Project-related erosion and debris deposition as well as stormwater-related impacts would be minimized, the design measures specified in the Drainage Concept Report (Psomas 2009) and the following measures shall be implemented subject to review and approval by the Los Angeles County Department of Public Works (LACDPW): • Avoidance of all drainage areas: Construction and operational phase activities shall avoid all on-site drainages and FEMA Zone A floodplain areas. Solar field development shall be set back from the two major drainages (Drainages A and C) by a minimum of approximately 100 feet from the tops of banks for both Drainages A and C. Additionally, all Project development shall be set back a minimum of 100 feet from the FEMA Zone A floodplain for Drainage C. • Applicant shall comply with NPDES requirements of the Lahontan Regional Water Quality Control Board (LRWQCB) and the LACDPW.	Submittal and approval of final drainage plan and File Notice of Intent and Maintain log demonstrating compliance with NPDES requirements and Site inspection	Prior to issuance of grading permit and During construction and operation	Applicant/Construction Manager	LACDPW LRWQCB

MITIGATION MONITORING AND REPORTING PROGRAM
PROJECT NO. R2009-02239

Mitigation Measures	Action Required	Mitigation Timing	Responsible Agency or Party	Monitoring Agency or Party
FIRE HAZARDS				
MM-5.4-1: Fire Protection and Prevention Plan. The proposed Project shall develop and submit a Fire Protection and Prevention Plan to the LACFD for review and approval prior to issuance of a Grading Permit. The Plan shall address construction and operation activities for the Project, and establish standards and practices that will minimize the risk of fire danger, and in the case of fire, provide for immediate suppression and notification. The Fire Protection and Prevention Plan shall address spark arresters, smoking and fire rules, storage and parking areas, use of gasoline-powered tools, road closures, use of a fire guard, and fire suppression equipment and training requirements. In addition, all vehicle parking areas, storage areas, stationary engine sites and welding areas shall be cleared of all vegetation, and flammable materials. All areas used for dispensing or storage of gasoline, diesel fuel or other oil products shall be cleared of vegetation and other flammable materials. These areas shall be posted with signs identifying they are "No Smoking" areas. An interim fire protection system shall be in place during construction until the permanent system is completed. The Plan shall also address vegetation clearance and maintenance requirements applicable to the transmission pole structures during operation. Special attention shall be paid to operations involving open flames, such as welding, and use of flammable materials. Personnel involved in such operations shall have appropriate training. A fire watch utilizing appropriately classed extinguishers or other equipment shall be maintained during hot work operations. Site personnel shall not be expected to fight fires past the incident stage. The local responding fire officials shall be given information on the site hazards and the	Submittal and approval of Fire Protection and Prevention Plan and Provide training to personnel dealing in operations involving open flares and flammable materials and Site inspection and Maintain log demonstrating compliance	Prior to issuance of grading permit and During construction and operation	Applicant/Construction Manager	LACFD

MITIGATION MONITORING AND REPORTING PROGRAM
PROJECT NO. R2009-02239

Mitigation Measures	Action Required	Mitigation Timing	Responsible Agency or Party	Monitoring Agency or Party
location of these hazards, and the information shall be included in the emergency response planning.				
Materials brought on-site shall conform to contract requirements, insofar as flame resistance or fireproof characteristics are concerned. Specific materials in this category include fuels, paints, solvents, plastic materials, lumber, paper, boxes, and crating materials. Specific attention shall be given to storage of compressed gas, fuels, solvents, and paint. Electrical wiring and equipment located in inside storage rooms used for Class I liquids shall be stored in accordance with applicable regulations. Outside storage areas shall be graded to divert possible spills away from buildings and shall be kept clear of vegetation and other combustible materials.				
On-site fire prevention during construction shall consist of portable and fixed firefighting equipment. Portable firefighting equipment shall consist of fire extinguishers and small hose lines in conformance with Cal-OSHA and the National Fire Protection Association (NFPA) for the potential types of fire from construction activities. Periodic fire prevention inspections shall be conducted by the Manager's safety representative.				
Fire extinguishers shall be inspected routinely and replaced immediately if defective or in need of recharge. All firefighting equipment shall be conspicuously located and marked with unobstructed access. A water supply of sufficient volume, duration, or pressure to operate the required firefighting equipment shall be provided on-site. Authorized storage areas and containers for flammable materials shall be used with adequate fire control services.				
The Operations Fire Protection and Prevention Program shall address the following:				

MITIGATION MONITORING AND REPORTING PROGRAM
PROJECT NO. R2009-02239

Mitigation Measures	Action Required	Mitigation Timing	Responsible Agency or Party	Monitoring Agency or Party
• Names and/or job titles responsible for maintaining equipment and accumulation of flammable or combustible material control • Procedures in the event of fire • Fire alarm and protection equipment • System and equipment maintenance • Monthly inspections • Annual inspections • Firefighting demonstrations • Housekeeping practices • Training				
WATER QUALITY				
Mitigation Measure 5.5-1: On-site Wastewater Treatment System Feasibility Report. Prior to construction/installation of the on-site septic/leach field system, a complete OWTS feasibility report shall be submitted to the LACDPH for review and approval. The feasibility report shall be prepared in conformance with the requirements outlined in the current version of LACDPH guidelines, "On-site Wastewater Treatment System Guidelines."	Submittal and approval of OWTS feasibility report	Prior to construction/installation of on-site septic/leach field system	Applicant/Construction Manager	LACDPH
AIR QUALITY				
MM 5.6-1: Ensure AVAQMD Construction Emission Thresholds would be Met. Prior to issuance of the grading permit, the Applicant shall select an engineering, procurement, and construction (EPC) contractor to build the Project. The Applicant/EPC contractor shall be required to demonstrate that the final construction plans will not result in exceedances of applicable AVAQMD air emission significance	Submittal and approval of Construction Emissions Report	Prior to issuance of grading permit	Applicant/Construction Manager	AVAQMD LACDRP

MITIGATION MONITORING AND REPORTING PROGRAM
PROJECT NO. R2009-02239

Mitigation Measures	Action Required	Mitigation Timing	Responsible Agency or Party	Monitoring Agency or Party
thresholds during construction of the Project to the satisfaction of AVAQMD and LACDRP. Prior to issuance of a grading permit, the Applicant shall prepare a report describing the Applicant's final engineering design-based plan for constructing the Project, including: 1) scheduling of construction activities; 2) equipment usage and details; 3) construction workforce loading; 4) truck deliveries schedule; and 5) ground disturbing/dust generating activities, etc. The report shall include emission calculations to demonstrate that the final construction plan will not result in exceedances of all applicable AVAQMD criteria pollutant emissions thresholds to the satisfaction of AVAQMD. The emission calculations shall include consideration of the emission reductions provided by implementation of Mitigation Measures 5.6-2 through 5.6-10, below.				
MM 5.6-2: Develop and Implement Fugitive Dust Emission Control Plan. The Applicant shall develop a Fugitive Dust Emission Control Plan (FDECP) for construction work. The FDECP shall be submitted to AVAQMD for review and approval prior to issuance of a grading permit. Measures to be incorporated into the FDECP shall include, but are not limited to the following: • The proposed PM measures (#24 to #44) in AVAQMD's List and Implementation Schedule for District Measures to Reduce PM Pursuant to Health & Safety Code §39614(d) shall be incorporated into the fugitive dust control plan, as applicable. • Non-toxic soil binders shall be applied per manufacturer recommendations to active unpaved roadways, unpaved staging	Submittal and approval of Fugitive Dust Emission Control Plan and Maintain log demonstrating compliance and Site inspection	Prior to issuance of grading permit and During construction	Applicant/Construction Manager	LACDRP AVAQMD

MITIGATION MONITORING AND REPORTING PROGRAM
PROJECT NO. R2009-02239

Mitigation Measures	Action Required	Mitigation Timing	Responsible Agency or Party	Monitoring Agency or Party
areas, and unpaved parking area(s) throughout construction to reduce fugitive dust emissions.				
• Travel on unpaved roads shall be reduced to the extent possible, by limiting the travel of heavy equipment in and out of the unpaved areas.				
• Water the disturbed areas of the active construction sites at least three times per day, (when soil moisture conditions result in dust generation) and more often if visible fugitive dust leaving the site is noted.				
• Enclose, cover, water twice daily, and/or apply non-toxic soil binders according to manufacturer's specifications to exposed piles of soils with a five percent or greater silt content.				
• Maintain unpaved road vehicle travel to the lowest practical speeds, and no greater than 15 miles per hour (mph), to reduce fugitive dust emissions.				
• All vehicle tires shall be inspected, be free of dirt, and washed as necessary prior to entering paved roadways from the Project site.				
• Install wheel washers or wash the wheels of trucks and other heavy equipment where vehicles exit the site.				
• Cover all trucks hauling soil and other loose material, or require at least 2 feet of freeboard.				
• Establish a vegetative ground cover (in compliance with biological resources impact mitigation measures) or otherwise create stabilized surfaces on all unpaved areas through application of dust palliatives at each of the construction sites within 21 days after active construction operations have ceased.				
• Prepare contingency for high wind periods (greater than 25 mph)				

MITIGATION MONITORING AND REPORTING PROGRAM
PROJECT NO. R2009-02239

Mitigation Measures	Action Required	Mitigation Timing	Responsible Agency or Party	Monitoring Agency or Party
to shutdown or mitigate activity as necessary to control fugitive dust. • Travel routes to each construction site area shall be developed to minimize unpaved road travel. Travel management shall include staging of deliveries to minimize idling or congestion, use of dust palliatives or soil tackifiers on road surfaces, and minimizing travel distance.				
MM 5.6-3: Dust Plume Response Requirement. An air quality construction mitigation manager (AQCMM) or delegate shall monitor all construction activities for visible dust plumes. Observations of visible dust plumes that have the potential to be transported: 1) off the Project site; 2) 200 feet beyond the centerline of the construction of linear facilities; or 3) within 100 feet upwind of any regularly occupied structures not owned by the Project owner indicate that existing mitigation measures are not resulting in effective mitigation. The AQCMM or Delegate shall promptly implement additional dust plume reduction measures in the event that such visible dust plumes are observed. Additional measures to be implemented, as necessary, shall include increased watering, application of dust palliatives, and/or scaled back construction activities up to and including temporary work cessation.	Dust plume monitoring and Maintain log demonstrating compliance	During construction	Applicant/Construction Manager	LACDRP AVAQMD
MM 5.6-4: Off-road Diesel-fueled Equipment Standards. All portable construction diesel engines not registered under CARB's Statewide Portable Equipment Registration Program, which have a rating of 50 hp or more, and all off-road construction diesel engines not registered under CARB's In-use Off-road Diesel Vehicle Regulation, which have a rating of 25 hp or more, shall meet, the	Conduct fleet average calculation annually and Submittal and approval of	Prior to issuance of grading permit and During construction	Applicant/Construction Manager	LACDRP AVAQMD

MITIGATION MONITORING AND REPORTING PROGRAM
PROJECT NO. R2009-02239

Mitigation Measures	Action Required	Mitigation Timing	Responsible Agency or Party	Monitoring Agency or Party
projected 2011 fleet average of NO_X and PM emissions as that predicted by the OFFROAD2007 model in Appendix D. The EPC shall use the CARB Portable Diesel Engine Airborne Toxic Control Measure (ATCM) Fleet Calculators and the Off-road Diesel Fleet Average Calculators (for large/medium fleets) in accordance with the respective regulation under Title 13 of the California Code of Regulations (CCR) to conduct this comparison. No Tier 0 diesel equipment shall be used at the site after the initial calculation/registration without recalculation using the CARB fleet calculators. The fleet average calculation of the on site equipment shall be conducted annually to ensure compliance. The EPC Manager shall ensure labeling of all portable and off road diesel equipment in accordance with Title 13 of the CCR.	Construction Emissions Report and Maintain log demonstrating compliance			
MM 5.6-5: Limit Vehicle Traffic and Equipment Use. Vehicle trips and equipment use shall be limited by efficiently scheduling staff and daily construction activities to minimize the use of unnecessary/duplicate equipment.	Submittal and approval of Construction Emissions Report and Maintain log demonstrating compliance	Prior to issuance of grading permit and During construction	Applicant/Construction Manager	LACDRP AVAQMD
MM 5.6-6: Heavy Duty Diesel Water Haul Vehicle Equipment Standards. For the pile foundation case (which results in higher air emissions than the ballast foundation case and requires additional mitigation), the EPC shall use 2006 model or newer engines in order to meet the EMFAC predicted emissions levels in grams of pollutant per mile travelled (g/mile) of on-road heavy duty diesel trucks used for water hauling at the site. The EPC contractor shall ensure labeling of	Submittal and approval of Construction Emissions Report and Maintain log	Prior to issuance of grading permit and During construction	Applicant/Construction Manager	LACDRP AVAQMD

MITIGATION MONITORING AND REPORTING PROGRAM
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Mitigation Measures	Action Required	Mitigation Timing	Responsible Agency or Party	Monitoring Agency or Party
such trucks to indicate model year.	demonstrating compliance			
MM 5.6-7: On-road Vehicles Standards. All on-road construction vehicles shall meet all applicable California on-road emission standards and shall be licensed in the State of California. This does not apply to construction worker personal vehicles.	Maintain log demonstrating compliance	During construction	Applicant/Construction Manager	LACDRP AVAQMD
MM 5.6-8: Properly Maintain Mechanical Equipment. The construction contractor shall ensure that all mechanical equipment associated with Project construction is properly tuned and maintained in accordance with the manufacturer's specifications.	Maintain log demonstrating compliance	During construction	Applicant/Construction Manager	LACDRP AVAQMD
MM 5.6-9: Restrict Engine Idling to 5 Minutes. Diesel engine idle time shall be restricted to no more than 5 minutes as required by the CARB engine idling regulation. Exceptions in the regulation include vehicles that need to idle as part of their operation, such as concrete mixer trucks.	Maintain log demonstrating compliance	During construction	Applicant/Construction Manager	LACDRP AVAQMD
MM 5.6-10: Off-road Gasoline-fueled Equipment Standards. Any off-road stationary and portable gasoline powered equipment brought on site for construction activities shall have USEPA Phase 1/Phase 2 compliant engines, where the specific engine requirement shall be based on the new engine standard in affect two years prior to the commencement of Project construction. In the event that USEPA Phase 1/Phase 2 compliant engines are determined not to be available, the Applicant shall provide documentation to the AVAQMD with an explanation.	Submittal and approval of Construction Emissions Report and Maintain log demonstrating compliance	Prior to issuance of grading permit and During construction	Applicant/Construction Manager	LACDRP AVAQMD
MM 5.6-11: Off-road Equipment Operator Worker Protection. Appropriate training for respiratory protection shall be provided to construction workers. Dust masks (NIOSH approved) shall be	Administer training to construction workers and provide NIOSH	Prior to and during construction	Applicant/Construction Manager	LACDRP AVAQMD

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provided with proper training to construction workers to mitigate the protection against dust exposure and possibly Valley Fever during high wind events and/or dust-generating activities.	approved dust masks and Maintain log demonstrating compliance			
BIOLOGICAL RESOURCES				
MM 5.7-1: Habitat Enhancement and Vegetation Management Plan. Prior to issuance of a grading permit, the Project Applicant shall develop a Habitat Enhancement and Vegetation Management Plan (HEVMP) to compensate for impacts to existing vegetation communities by preserving and enhancing the remaining vegetation within the Project site. The HEVMP shall also provide measures to ensure minimal impacts to habitat along the off-site transmission line. In areas suitable for on-site mitigation, the HEVMP shall identify appropriate mitigation objectives, standards, and monitoring/reporting requirements to enhance habitat such that the resulting habitat values would be greater than those lost as a result of project implementation. These habitat values would include nesting and foraging habitat for songbirds, foraging habitat for raptors and owls, and high diversity and abundance of native forbs/wildflowers. In areas rendered unsuitable for mitigation due to proposed development, the HEVMP shall identify appropriate restrictions, such as limiting noxious weeds, but shall not impose mitigation standards. The HEVMP shall be prepared by a qualified restoration biologist experienced with desert habitat restoration, and shall specify appropriate revegetation and management practices for the following portions of the Project site to the satisfaction of LACDRP:	Submittal and approval of Habitat Enhancement and Vegetation Management Plan and Maintain log demonstrating compliance and Site inspection	Prior to issuance of grading permit and During construction and operation	Applicant/ Qualified Biologist/Construction Manager	LACDRP

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• Mitigation and Avoidance Areas (refer to Figure 5.7-11 of this DEIR): 1. Drainage A, a 100-foot setback, and the associated wildlife travel route (47.1 acres) 2. Drainage B and a 20-foot buffer (approximately 6 acres) 3. The southernmost portion of the Project site along Drainage C, where no development is proposed (45 acres) 4. The Joshua tree recruitment area (8.6 acres, including buffer) • Areas of Modified/Impacted Habitat (Unsuitable for Mitigation): 1. All portions of the site within the fire breaks (217 acres) 2. All interior portions of the site within the proposed solar arrays, excluding locations of proposed infiltration basins and fire breaks (1,336 acres) 3. All portions of the site to be occupied by proposed infiltration basins (253 acres) In general, for each of the locations enumerated above, the HEVMP shall specify, at a minimum, the following (specific details vary depending on location, and are described in the paragraphs that follow): • The location and extent of any on-site enhancement/revegetation areas, to be depicted graphically on an aerial photograph or schematic of appropriate scale • The quantity and species of plants to be seeded (if necessary), including the locations where each type of vegetation would be created				

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• A schedule and action plan to maintain and monitor the enhancement/revegetation areas • A list of success criteria (e.g., growth, plant cover, plant/wildlife diversity) by which to measure success of the enhancement/revegetation effort • Contingency and/or adaptive management measures in the event that enhancement/revegetation efforts are not successful In addition, the standards and practices set forth in the HEVMP for each area shall conform to the requirements stated below: • Within the setback zones surrounding Drainage A, Drainage B, and Drainage C the HEVMP shall provide for 101 acres of on-site mitigation, as well as 6 acres of additional avoidance area (due to its small and isolated nature, the 6-acre area surrounding Drainage B is not included as suitable mitigation land, but would nonetheless be avoided), and shall ensure the following: 1. Drainages A, B, and C, including adjacent buffer areas shown on Figures 5.7-7 and 5.7-11, as well as the local wildlife travel route associated with Drainage A, shall be set aside, preserved, and enhanced, and no Project-related disturbance shall be permitted in these areas. 2. Any anthropogenic discontinuities in the existing vegetation (unofficial roads, dump sites, etc.) within the ephemeral drainage setbacks shall be remedied, and such areas shall be seeded with native plant species characteristic of the surrounding vegetation. 3. Vegetative cover in herbaceous communities (grasslands, wildflower fields) shall exceed 95 percent; of this, invasive				

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forbs (as identified by the Cal-IPC) shall not exceed five percent cover. Bare ground shall not exceed five percent excluding bare ground located within the channel bottom of an ephemeral drainage or bare ground where there is clear evidence that the bare ground was the result of mammal activity (burrows, wildlife trails, etc.).				
4. Vegetative cover in shrub-dominated communities (desert saltbush scrub, rabbitbrush scrub) shall exceed 90 percent, and shrub cover shall exceed 30 percent. Invasive forbs and shrubs combined shall not exceed five percent cover, and bare ground shall not exceed five percent excluding bare ground located within the channel bottom of an ephemeral drainage or bare ground where there is clear evidence that the bare ground was caused by mammal activity (burrows, wildlife trails, etc.).				
5. In Drainages A and C and the adjacent setback/buffer areas as shown on Figure 5.7-7, vegetation in the area shall remain suitable for foraging by burrowing owls and other grassland bird species. Habitat enhancement/revegetation shall be implemented if necessary to ensure continued suitability.				
6. Joshua trees and junipers shall be planted, to improve habitat suitability for sensitive bird species and increase the likelihood that these areas will be occupied by such special-status species as loggerhead shrikes and long-eared owls.				
• Within the Joshua tree recruitment area, the HEVMP shall provide 8.6 acres of mitigation land, and shall ensure the following:				

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1. The Joshua tree recruitment area and a 50-foot buffer from the Joshua tree seedlings shall be set aside and preserved, and no Project-related disturbance shall be permitted in this area.				
2. Any anthropogenic discontinuities in the existing vegetation (other than the County roadbed of West Avenue C, which passes through this area) shall be remedied, and such areas shall be seeded with native plant species characteristic of the surrounding vegetation.				
3. Measures shall be implemented to encourage the continued recruitment of Joshua trees into this area. Such measures may include standards for herbaceous and shrub cover, removal of non-native plants and wildlife, and others.				
4. To provide nesting and perching habitat and increase structural diversity within restoration areas, native shrub species associated with Joshua tree woodland (including Mojave yucca, sage, box-thorn, and buckwheat, as noted in the County General Plan) shall be included in the planting palette.				
• Within the proposed fire breaks, no suitable on-site mitigation opportunities exist. However, the HEVMP shall ensure the following:				
1. To prevent the potential spread of fire onto the Project site, the proposed fire breaks shall be maintained clear of vegetative cover through mechanical clearing and selective herbicide use.				
2. If herbicides are used as approved by LACDRP to control				

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vegetation, they shall be applied by a qualified individual and in a manner consistent with the product labeling. Under no circumstances shall herbicides be allowed to pass into any ephemeral drainage.				
3. Under no circumstances shall forb species identified by the California Invasive Plant Council (Cal-IPC) as invasive weeds be allowed to thrive in the fire breaks, or as required by LACFD. Cover of these species, collectively, shall be maintained at or below five percent.				
• Within all interior portions of the site within and adjacent to the proposed solar arrays, excluding locations of proposed infiltration basins, no suitable on-site mitigation opportunities would exist. However, the HEVMP shall ensure the following:				
1. To control fugitive dust, vegetative cover of grasses and forbs within the proposed solar arrays shall be maximized.				
2. Vegetation seeded in these areas shall be comprised of low-growing communities such as native grasslands and wildflower fields, to minimize the effects of vegetation management practices on the revegetated areas. Shrub species shall not be used, as these species would be unable to survive continued vegetation trimming.				
3. Under no circumstances shall species identified by the Cal-IPC as invasive weeds be used in the revegetation efforts.				
4. To promote the growth of local, native plant species, the top 2-6 inches of topsoil removed during Project-related grading and/or excavation shall be stockpiled and spread across disturbance zones after completion of construction in the				

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area. 5. To ensure that a seed supply is maintained to perpetuate on-site vegetation (e.g., annual grasses and wildflowers), vegetation shall be allowed to grow to a maximum height of 18 inches between February 1 and approximately mid-April prior to mowing to a height of 6 inches (or less) by May 1 (through the following January) as required by the LACFD. 6. Herbicides shall be approved for use by the County, and herbicide application shall be performed by trained personnel who can identify the species to be treated. If herbicide is applied, it shall be applied during dry and low wind conditions in order to prevent herbicide drift into non-target areas. • Within the proposed infiltration basins, no suitable on-site mitigation opportunities exist. However, the HEVMP shall ensure the following: 1. If herbicides are used as approved by LACDRP to control vegetation (i.e., non-native vegetation), they shall be applied by a qualified individual and in a manner consistent with the product labeling. Under no circumstances shall herbicides be allowed to pass into any ephemeral drainage. 2. Under no circumstances shall forb species identified by Cal-IPC as invasive weeds be allowed to thrive in the infiltration basins, or as required by LACFD. Cover of these species, collectively, shall be maintained at or below five percent. • Within all portions of the transmission line route to be impacted during installation of transmission line poles and temporary				

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stringing sites, the HEVMP shall ensure the following: 1. Under no circumstances shall ground disturbance occur within 25 feet of an existing Joshua tree. In applicable areas, Joshua tree avoidance zones shall be delineated with high-visibility construction fencing. 2. All areas of temporary ground disturbance shall be revegetated with appropriate plant communities native to the Project region, such as native grasslands, wildflower fields, desert scrub, rabbitbrush scrub, desert saltbush scrub, and Joshua tree woodland. 3. Where impacts would occur in existing agricultural lands outside the Applicant's ownership, it is presumed that agricultural practices would resume after completion of construction. Therefore, revegetation shall not be required in these areas. 4. If earthwork is proposed in areas where native vegetation exists, the top 2-6 inches of topsoil removed during Project-related ground clearing shall be stockpiled and spread across disturbance zones after completion of construction in the area. 5. Under no circumstances shall species identified by the Cal-IPC as invasive weeds be used in the revegetation efforts. 6. The HEVMP shall include provisions to minimize the effects of transmission line maintenance on biological resources, including a requirement that no Joshua trees shall be removed during such maintenance. In addition to the location-specific requirements set forth above, the				

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HEVMP shall also ensure that the following standards are met or exceeded within the Project site as a whole: 1. The HEVMP shall identify appropriate locations for creation of rabbitbrush scrub, California annual grassland, and wildflower fields, the three most abundant existing natural communities on-site, within avoided portions of the Project site. In total, 101 acres of on-site mitigation shall be provided. 2. Performance monitoring of the on-site enhancement and revegetation areas shall be monitored approximately quarterly, in January, April, June, and November, and a report detailing the monitoring results shall be submitted to the LACDRP annually. Monitoring and reporting shall be required for a period of five years and until such time as performance standards are achieved. The HEVMP shall contain contingency measures identifying corrective actions required in the event that the performance standards are not met. 3. All percent cover standards shall be evaluated during the spring biomass peak. 4. Anti-coagulant rodenticides shall not be used within the Project site or along the proposed transmission line route. The HEVMP shall be submitted to the LACDRP for review and approval prior to issuance of a grading permit.				
MM 5.7-2: Off-site Mitigation for Loss of Habitat. Within one year of Project approval or prior to the installation of 50 MW of photovoltaic solar panels, the Applicant shall provide a minimum of 450 acres of off-site mitigation land to be restored, enhanced, and maintained according to the requirements of this mitigation measure, and shall be	Acquisition of a minimum of 450 acres of off-site mitigation land	Mitigation lands to be acquired within one year of Project approval or prior to the installation of 50 MW of	Applicant/Qualified Biologist	LACDRP

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preserved as open space in perpetuity. Within 45 days of acquiring the mitigation land(s), the Applicant shall record a permanent deed restriction on the mitigation land(s) to be preserved as open space. The deed restriction language shall be submitted to LACDRP for review and approval prior to recordation. Alternatively, should a conservation easement on the mitigation land(s) be offered, the permanent conservation easement(s) shall be recorded to the satisfaction of LACDRP. The off-site mitigation land shall not exceed 10 separate fragments and shall be acquired adjacent to existing public lands, or within or adjacent to SEAs within the Antelope Valley or surrounding foothills. At least 225 acres of the mitigation land shall be acquired in the vicinity of the Antelope Valley California Poppy Reserve, including lands in or adjacent to SEA #57, or lands connecting the Poppy Reserve to the Angeles National Forest. An additional 75 acres shall be acquired within this same area, or in or adjacent to SEA #60, or adjacent to the Arthur B. Ripley Woodland State Park. The Applicant shall establish a fund sufficient for the restoration, enhancement, and maintenance of the mitigation land(s) until such time when the mitigation land(s) become self-sustained and meet the requirements of this mitigation measure. The fund shall be established within 90 days of mitigation land(s) acquisition in an amount acceptable to the LACDRP. The selected off-site mitigation lands shall contain vegetation communities similar to those found within the Project site, including rabbitbrush scrub, annual grassland, and wildflower fields. Although the proposed Project would not significantly impact Joshua tree woodland habitat, lands containing this vegetation community shall	and Record permanent deed restriction(s), or conservation easement(s) on the mitigation land(s) to the satisfaction of LACDRP and Submittal and approval of Restoration, Enhancement, and Maintenance Plan and Establish sufficient fund for the restoration, enhancement, and maintenance of the mitigation land(s)	photovoltaic solar panels and Deed restriction(s) or conservation easement(s) to be recorded within 45 days of acquiring mitigation lands and Restoration, Enhancement, and Maintenance Plan shall be submitted within 60 days of recordation of permanent deed restriction(s) or conservation easement(s) and Establish fund within 90 days of mitigation land(s) acquisition		

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also be considered desirable due to the County's concern over the continuing loss and degradation of Joshua tree woodlands. The selected lands shall comply with the following mitigation requirements: 1. The subject property shall be located within the greater Project vicinity, generally defined to include the Antelope Valley and surrounding foothills. 2. The subject property(s) shall contain a minimum of 450 acres of land, which shall be either comprised of vegetation communities characteristic of the Antelope Valley (rabbitbrush scrub, annual grassland, wildflower fields, and/or Joshua tree woodlands) or be reasonably capable of being enhanced and converted to such habitat through the use of maintenance and management practices such that the resulting habitat values would be greater than those lost as a result of Project implementation. 3. The subject property(s) shall either contain a minimum of 224.5 acres of wildflower field, or shall be reasonably capable of being enhanced and converted to this vegetation through maintenance and management practices. 4. The subject property(s) shall provide at least 39 acres of contiguous suitable foraging habitat for the burrowing owl, including presence of suitable burrows. If suitable natural burrows are not present within the subject property, artificial burrows shall be constructed in accordance with California Burrowing Owl Consortium (1993) guidelines. 5. The subject property(s) shall contain a minimum of 450 acres of suitable foraging habitat for grassland/scrubland bird species occurring in the Antelope Valley.				

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6. The subject property(s) shall contain habitat suitable for the Blainville's horned lizard. Within the mitigation site, suitable locations shall be identified for relocation of horned lizards captured and removed from the Project site pursuant to Mitigation Measure 5.7-7. Generally, it is presumed that the wildflower field areas required by item (3) above will be suitable for this species.				
7. Under no circumstances shall species identified by the Cal-IPC as invasive weeds be used in revegetation efforts.				
8. The subject property(s) shall be maintained such that invasive forbs (as identified by the Cal-IPC) shall not exceed 5 percent of the vegetative cover.				
Within 60 days of recordation of the permanent deed restriction(s) or conservation easement(s), a Restoration, Enhancement, and Maintenance Plan for the off-site mitigation land(s) shall be submitted to LACDRP for review and approval. The plan shall include the restoration, enhancement, and maintenance requirements for each mitigation area, based on the characteristics of the mitigation land and the mitigation requirements described above, and shall also include contingency measures in the event that habitat creation/restoration/ enhancement efforts are not successful. The Restoration, Enhancement, and Maintenance Plan shall also describe the performance standards for determining when the mitigation requirements for the lands have been met.				
In addition to meeting the requirements detailed above, the following desirable factors shall also be considered when selecting off-site mitigation property(s):				
1. Lands located between blocks of protected habitat are desirable locations for off-site mitigation, as protecting these areas can				

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ensure that essential habitat connections remain in perpetuity. 2. Lands containing Joshua tree woodland habitat are desirable locations for off-site mitigation, due to the continuing loss and degradation of this resource. 3. Lands containing junipers are also desirable locations for off-site mitigation, due to the nesting habitat they may provide for some special-status bird species. 4. Lands containing important landscape features, sensitive habitats, or listed species are desirable locations for off-site mitigation, due to the sensitivity of these resources and the general understanding that such elements are indicative of high biological value.				
MM 5.7-3: Biological Restrictions on Dust Suppression. Where construction activities are proposed within 100 feet of mapped Joshua tree woodland vegetation or the Joshua tree recruitment area, a screening fence (i.e., a 6-foot-high chain link fence with green fabric up to a height of 5 feet) shall be installed to protect locations where these sensitive resources may be present to the satisfaction of LACDRP. In addition, dust abatement within 100 feet of these areas shall be achieved by water or by chemical dust suppression if authorized by the County and CDFG.	Install screening fence and Maintain log demonstrating compliance and Site inspection	During construction	Applicant/Construction Manager	LACDRP
MM 5.7-4: Nesting Bird Surveys Prior to Mowing. Should mowing for vegetation management purposes occur during the nesting/breeding season of native bird species potentially nesting on the site (typically February through August in the Project region, or as determined by a qualified biologist), the Applicant shall have weekly	Conduct weekly nesting bird surveys during nesting/breeding season	Prior to mowing activities during nesting/breeding season	Applicant/Qualified Biologist	LACDRP CDFG

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nesting bird surveys conducted. These surveys shall be conducted by a qualified biologist, shall commence within 30 days prior to any mowing, and shall be conducted to determine whether any active nests of special-status bird species, or of any bird species protected by the Migratory Bird Treaty Act or the California Fish and Game Code, are present in the disturbance zone or within 300 feet (500 feet for raptors) of the area to be disturbed. The surveys shall occur on a weekly basis, with the last survey being conducted no more than seven days prior to initiation of mowing activities. If mowing is delayed, then additional surveys shall be conducted such that no more than seven days would have elapsed between the survey and mowing. The Applicant or Manager shall provide the biologist with plans detailing the extent of proposed mowing prior to the survey effort. If active nests are found, mowing within 300 feet (500 feet for raptors) of the nest shall be postponed or halted, at the discretion of the biologist, until the nest is vacated and juveniles have fledged, as determined by the biologist, and there is no evidence of a second attempt at nesting. Limits of mowing to avoid an active nest shall be established in the field with highly visible construction fencing, and solar plant personnel shall be instructed on the sensitivity of nest areas. The results of the surveys, including graphics showing the locations of any nests detected, and any avoidance measures implemented, shall be submitted to the LACDRP and CDFG within 14 days of completion of the surveys to document compliance with applicable state and federal laws pertaining to the protection of native birds. Nesting bird surveys shall be conducted in each of the first five years after Project development. At the end of this period, the results	and Submittal and approval of survey reports			

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of the first five years of surveys shall be submitted to the LACDRP and CDFG. After submittal of the first five-year survey results, the County of Los Angeles, under consultation with CDFG, shall determine whether or not the nesting bird surveys shall continue.				
MM 5.7-5: Biological Monitor. Prior to grading, a qualified biologist shall be retained by the Applicant as the biological monitor subject to the approval of the County of Los Angeles. The biological monitor shall ensure that impacts to biological resources are avoided or minimized to the fullest extent possible. During earth moving activities, the biological monitor shall be present to relocate any vertebrate species that may come into harm's way to undisturbed areas of suitable habitat using appropriate methods that would not injure the wildlife. The biological monitor shall have the authority to stop specific grading or construction activities if violations of mitigation measures or any local, state, or federal laws are suspected.	Biological monitoring and Maintain log demonstrating compliance	During construction	Applicant/Qualified Biologist	LACDRP
MM 5.7-6: Worker Environmental Education Program. A Worker Environmental Education Program shall be developed for construction crews by a qualified biologist(s) provided by the Applicant. Training materials and briefings shall include but not be limited to: discussion of the value and identification of special-status species, including the burrowing owl and desert tortoise, review of sensitive species likely to occur within the construction area, the Migratory Bird Treaty Act and the consequences of non-compliance with this act, a contact person in the event of the discovery of dead or injured wildlife, and a review of mitigation requirements. The training sessions shall be conducted by a qualified biologist or other individual approved by the biologist. Maps showing the location of special-status wildlife or other construction limitations shall be provided to the environmental monitors and	Administer Worker Environmental Education Program and Maintain log demonstrating compliance	Prior to and ongoing during construction activities (as needed for new construction workers)	Applicant/Qualified Biologist/Construction Manager	LACDRP

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construction crews prior to construction activities. As part of the environmental training, Managers and heavy equipment operators shall be provided with photographs or illustrations of expected special-status wildlife species so they will able to identify them, and avoid harming them during construction.				
MM 5.7-7: Blainville's Horned Lizard Capture and Relocation. Prior to the initiation of ground clearing activities, capture and relocation efforts shall be conducted for the Blainville's horned lizard to the satisfaction of LACDRP. Trapping shall be conducted by a County-approved biologist possessing proper scientific collection and handling permits, and shall include the following steps: • Prior to initiating the capture and relocation effort, a suitable receptor location shall be identified to receive relocated horned lizards. The receptor locations shall contain suitable habitat for this species, including open, shrub-dominated vegetation. The 45-acre avoidance area near the southern edge of the Project site likely constitutes a suitable on-site receptor location. • The capture and relocation effort shall take place during the active season (April through October) preceding commencement of ground disturbance activities, when lizards are most likely to be active. Surveys shall be conducted when air temperatures immediately above the ground surface is between 70°F (21°C) and 102°F (39°C). All areas proposed for temporary or permanent ground disturbance shall be surveyed for the Blainville's horned lizard. • Surveys shall be conducted by placing coverboards on the ground 4 to 6 weeks in advance of the survey effort, and	Perform capture and relocation efforts and Maintain log demonstrating compliance	Prior to ground clearing activities	Applicant/County-Approved Biologist	LACDRP

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checking the area under the coverboards for horned lizards on a weekly basis. Coverboards can consist of untreated lumber, sheet metal, corrugated steel, or other flat material. Captured lizards shall be placed immediately into containers containing sand or moist paper towels and released in designated receptor locations no more than three hours after capture. • If the biologist believes there is high potential for previously relocated lizards to return to the impact sites following relocation, silt fence shall be installed to prevent relocated individuals from reoccupying areas proposed for disturbance.				
MM 5.7-8: Pre-construction Nesting Bird Surveys. Within 30 days prior to vegetation clearing or ground disturbance associated with construction or grading that would occur during the nesting/breeding season of native bird species potentially nesting on the site (typically February through August in the project region, or as determined by a qualified biologist), the Applicant shall have weekly surveys conducted by a qualified biologist to determine if active nests of special-status bird species, or of any bird species protected by the Migratory Bird Treaty Act or the California Fish and Game Code, are present in the disturbance zone or within 300 feet (500 feet for raptors) of the disturbance zone. The surveys shall occur on a weekly basis, with the last survey being conducted no more than seven days prior to initiation of disturbance work. If ground disturbance activities are delayed, then additional pre-disturbance surveys shall be conducted such that no more than seven days will have elapsed between the survey and ground disturbance activities. The Applicant or Manager shall provide the biologist with plans detailing the extent of proposed ground disturbance prior to the survey effort.	Conduct weekly nesting bird surveys during nesting/ breeding season and Submittal and approval of pre-construction nesting bird survey reports	Nesting bird surveys prior to vegetation clearing or ground disturbance during nesting/breeding season	Applicant/Qualified Biologist	LACDRP CDFG

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If active nests are found, clearing and construction within 300 feet of the nest (500 feet for raptors) shall be postponed or halted, until the nest is vacated and juveniles have fledged, as determined by the biologist, and there is no evidence of a second attempt at nesting. Limits of construction to avoid an active nest shall be established in the field with highly visible construction fencing, and construction personnel shall be instructed on the sensitivity of nest areas. Occupied nests adjacent to the construction site shall also be avoided to ensure nesting success. A qualified biologist shall serve as a construction monitor during those periods when construction activities will occur near active nest areas to ensure that no inadvertent impacts on these nests occur. The results of the surveys, including graphics showing the locations of any nests detected, and documentation of any avoidance measures taken, shall be submitted to the LACDRP and CDFG within 14 days of completion of the pre-construction surveys or construction monitoring to document compliance with applicable state and federal laws pertaining to the protection of native birds.				
MM 5.7-9: Pre-Construction Wintering Burrowing Owl Surveys. If construction or site preparation activities are scheduled during the non-nesting season of the burrowing owl (typically September through January), the Applicant shall retain a qualified biologist to conduct wintering burrowing owl surveys within the area to be disturbed. The survey shall be conducted no more than 21 days prior to commencement of construction activities in the area. During the construction period, the results of the surveys, including graphics showing the locations of any active burrows detected and any avoidance measures required, shall be submitted to the LACDRP and	Submittal and approval of pre-construction wintering burrowing owl survey report(s) during non-nesting season and Submittal and	Prior to and during construction	Applicant/Qualified Biologist	LACDRP CDFG

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CDFG on a monthly basis. If active burrows are detected, the required avoidance measures shall conform to the following: • If burrowing owls are observed using burrows during the non-breeding season, occupied burrows shall be left undisturbed, and no construction activity shall take place within 300 feet of the burrow where feasible (see below). • If disturbance of owls and owl burrows is unavoidable, owls shall be excluded from all active burrows through the use of exclusion devices placed in occupied burrows in accordance with CDFG protocols (CDFG 1995). Specifically, exclusion devices, utilizing one-way doors, shall be installed in the entrance of all active burrows. The devices shall be left in the burrows for at least 48 hours to ensure that all owls have been excluded from the burrows. Each of the burrows shall then be excavated by hand and refilled to prevent reoccupation. Exclusion shall continue until the owls have been successfully excluded from the disturbance area, as determined by a qualified biologist. • If construction activities must be initiated in any area of the site during the burrowing owl breeding season (typically February through August), pre-construction surveys for burrowing owls shall be conducted. Any active burrowing owl burrows found at this season shall not be disturbed. Construction activities shall not be conducted within 300 feet of an active burrow at this season.	approval of pre-construction survey report(s) during burrowing owl breeding season and Implement avoidance measures, as applicable			
MM 5.7-10: Burrowing Owl Management Plan. Prior to issuance of a grading permit, a habitat management plan for the burrowing owl shall be developed for portions of the site supporting suitable habitat for	Submittal and approval of Burrowing Owl	Prior to issuance of grading permit	Applicant/Qualified Biologist	LACDRP CDFG

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burrowing owl and away from Project facilities and the solar panel arrays. Specifically, this plan shall be developed for implementation in the undeveloped areas surrounding Drainage A and in the southernmost portion of the Project site, near West Avenue E. At a minimum, the plan shall include the following elements: • If occupied burrows are to be removed, the plan shall contain schematic diagrams of artificial burrow designs and a map of potential artificial burrow locations within Drainage A and Drainage C that would compensate for the burrows removed. • A methodology for the eviction and passive relocation of any owls from the impact area to proactively established artificial burrows. • Provisions for vegetation management, specifying the maximum allowable vegetative cover adjacent to established artificial burrows and the methodology to be used in maintaining the appropriate cover. • Measures prohibiting the use of rodenticides. • The plan shall specify a minimum of 6.5 acres of suitable foraging habitat to be preserved or created through revegetation and restoration practices for every active burrowing owl burrow within the Project site. These mitigation areas shall not be located in areas shaded by the proposed solar arrays, and shall not be subject to vegetation mowing or other fuel management practices. Foraging areas shall be located adjacent to suitable natural or artificial burrow locations. The Burrowing Owl Habitat Management Plan may be prepared and presented either as a stand-alone document or as a component of the HEVMP required by Mitigation Measure 5.7 1, and shall be submitted	Habitat Management Plan			

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to the LACDRP and CDFG for review and approval prior to issuance of a grading permit for the Project.				
MM 5.7-11 Facility Lighting. Project facility lighting shall be designed to provide the minimum illumination needed to achieve safety and security objectives. All lighting shall be directed downward and shielded to focus illumination on the desired areas only and avoid light trespass into adjacent areas. Lenses and bulbs shall not extend below the shields. The lighting plan shall be submitted to LACDPW for review and approval.	Submittal and approval of Facility Lighting Plan and Site inspection	Prior to issuance of building permit	Applicant	LACDPW LACDRP
MM 5.7-12: Desert Kit Fox. To avoid injury or mortality of the desert kit fox, preconstruction surveys shall be conducted for this species concurrent with the pre-construction nesting bird surveys required by Mitigation Measure 5.7-4. A qualified biologist shall perform pre-construction surveys for kit fox dens in the Project site and along the proposed transmission line route, and shall survey all areas where Project facilities, transmission line poles, grading, mowing, equipment access, or other disturbances are proposed. If dens are detected, each den shall be classified as inactive, potentially active, or definitely active. Inactive dens in areas that would be impacted by construction activities shall be excavated by hand and backfilled to prevent reuse by desert kit fox. Active and potentially active dens in areas that would be impacted by construction activities shall be monitored by the biological monitor for three consecutive nights using a tracking medium (such as diatomaceous earth or fire clay) and/or infrared camera stations at the entrance. If no tracks are observed in the tracking medium or no photos of the target species are captured after three nights, the den shall be excavated and backfilled by hand to prevent reuse. If tracks are observed, the den shall be progressively	Submittal and approval of Pre-Construction Survey Report(s)	Within 30 days of completion of surveys, and prior to construction (ongoing as construction progresses to new areas)	Applicant/Qualified Biologist	LACDRP CDFG

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blocked with natural materials (rocks, dirt, sticks, and vegetation piled in front of the entrance) for the next three to five nights to discourage the kit fox from continuing to use the den. After verification that the den is unoccupied, it shall then be excavated and backfilled by hand to prevent reuse, while ensuring that no kit fox are trapped in the den. The Applicant shall submit a report to the LACDRP and CDFG within 30 days of completion of the kit fox surveys describing the survey methods, results, and details of any dens backfilled or foxes observed.				
MM 5.7-13: Pre-construction Desert Tortoise Surveys. Within 30 days prior to construction-related initial ground clearing and/or grading, the Applicant shall retain a qualified biologist to conduct surveys for signs of occupancy by the desert tortoise. Surveys shall be conducted on foot, and intended to detect any live tortoises or their carcasses, burrows, palates, tracks, or scat. Should any desert tortoise sign indicating the presence of desert tortoise be detected, the Applicant shall not proceed with ground clearing and/or grading activities in the area of the find and shall contact the USFWS and CDFG to develop an avoidance strategy. The results of the pre-construction surveys, including graphics showing the locations of any tortoise sign detected, and documentation of any avoidance measures taken, shall be submitted to the USFWS, CDFG, and LACDRP within 14 days of completion of the pre-construction surveys or construction monitoring to document compliance with applicable federal and state laws pertaining to the protection of desert tortoise.	Conduct desert tortoise surveys and Submittal and approval of pre-construction desert tortoise survey results	Within 30 days prior to construction-related ground clearing and/or grading and Within 14 days of completion of pre-construction surveys or construction monitoring	Applicant/Qualified Biologist	LACDRP USFWS CDFG

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CULTURAL AND PALEONTOLOGICAL RESOURCES				
MM 5.8-1: Avoid Archaeological Sites. Archaeological sites within the proposed Project area shall be avoided and protected from future disturbance or evaluated for significance and mitigated, as appropriate, to the satisfaction of the Los Angeles County Department of Regional Planning (LACDRP).	Maintain log to demonstrate compliance	During construction and operation	Applicant/Construction Manager/Cultural Resources Monitor	LACDRP
MM 5.8-2: Phase II Testing/Phase III Data Recovery. Prior to construction, Phase II testing and evaluation shall be conducted at all unavoidable prehistoric archaeological sites in the proposed Project area to determine their significance under Section 15064.5 of CEQA. Sites determined eligible for the California Register of Historic Resources (CRHR) shall either be avoided and protected from future disturbance, or a Phase III data recovery plan shall be prepared and implemented prior to construction to the satisfaction of LACDRP. All archaeological collections, technical reports and related documentation shall be curated at a curation facility approved by the County of Los Angeles.	Submittal and approval of Phase II Report/Phase III Data Recovery Plan, and related documentation, as applicable	Prior to construction	Applicant/Qualified Archaeologist	LACDRP
MM 5.8-3: Archaeological Monitoring. Prior to construction, an archaeological monitoring plan shall be prepared and implemented to the satisfaction of LACDRP. A qualified archaeological monitor shall be present during all ground disturbing activities, including vegetation clearing, grubbing, grading, filling, drilling, and trenching. In the event that any prehistoric or historic cultural resources (chipped or ground stone lithics, animal bone, ashy midden soil, structural remains, historic glass or ceramics, etc.) are discovered during the course of construction, all work in the vicinity shall halt, and the archaeologist shall record the resources on the appropriate California Department of	Submittal and approval of Archaeological Monitoring Plan and Submittal and approval of additional Phase II and Phase III technical reports,	Prior to issuance of grading permit and During construction and Following completion of ground-disturbance construction activities	Applicant/Qualified Archaeologist/Cultural Resources Monitor	LACDRP

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Parks and Recreation (DPR) 523 Series Forms, evaluate the significance of the find, and if significant, determine and implement the appropriate mitigation, including but not limited to Phase III data recovery and associated documentation to the satisfaction of LACDRP. Such activities may result in the preparation of additional Phase II and Phase III technical reports. After ground-disturbing construction activities have been completed, an archaeological construction monitoring report shall be completed and submitted to the LACDRP.	as applicable and Archaeological monitoring and Submittal of Archaeological Construction Monitoring Report			
MM 5.8-4: Native American Monitor. A Native American monitor (Tataviam/Fernadeno Band of Mission Indians) shall be notified prior to construction and allowed the opportunity to be present during all ground disturbing activities, including vegetation clearing, grubbing, grading, filling, drilling, and trenching. In the event that any sacred site or resource is identified, a Native American monitor shall be retained to divert construction activities to another area of the Project site while a proper plan for avoidance or removal is determined to the satisfaction of the LACDRP.	Notify Native American monitor of construction activities and Maintain log to demonstrate compliance and Site inspection	Prior to and during construction	Applicant/Construction Manager/Cultural Resources Monitor	LACDRP
MM 5.8-5: Human Remains. In the event human remains are encountered, construction in the area of the finding shall cease, and the remains shall stay in situ pending definition of an appropriate plan. The Los Angeles County Coroner (Coroner) shall be contacted to determine the origin of the remains. In the event the remains are Native American in origin, the NAHC shall be contacted to determine	Maintain log to demonstrate compliance and	During construction	Applicant/Construction Manager/Cultural Resources Monitor	LACDRP

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necessary procedures for protection and preservation of the remains, including reburial, as provided in the State of California Environmental Quality Act (CEQA) Guidelines, Section 15064.5(e), "CEQA and Archaeological Resources," CEQA Technical Advisory Series.	Site inspection			
MM 5.8-6: Paleontological Resources Protection. In the event paleontological discoveries are encountered by the cultural monitors, all excavation shall cease in the area of the find and a paleontologist shall be retained, who shall devise a plan for recovery in accordance with standards established by the Society of Vertebrate Paleontology. At least one of the on-site cultural monitors during construction shall have familiarity and expertise in paleontological resources and have the ability to recognize significant vertebrate paleontological resources. Any paleontological resources shall be documented and submitted to the Natural History Museum of Los Angeles County, or any other accredited institution (i.e., San Bernardino County Museum, UCLA Dept of Earth and Space Sciences) that will accept paleontological resources for curation.	Paleontological resources monitoring and Maintain log and documentation, as applicable, to demonstrate compliance	During construction	Applicant/Construction Manager/Cultural Resources Monitor	LACDRP
MM 5.8-7: Construction Worker Training. Prior to construction, the qualified archaeological monitor or qualified designee shall conduct a brief educational workshop such that all construction personnel understand monitoring requirements, roles and responsibilities of the monitors, and penalties for unauthorized artifact collecting or intentional disturbance of archaeological resources. The construction worker training shall include an overview of potential cultural and paleontological resources that could be encountered during ground disturbing activities to facilitate worker recognition, avoidance, and subsequent immediate notification to a designated on-site cultural monitor for further evaluation and action, as appropriate.	Implement educational workshop for all construction workers and Maintain log to demonstrate compliance	Prior to and ongoing during construction activities (as needed for new construction workers)	Applicant/Construction Manager/Qualified Archaeological Monitor	LACDRP

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AGRICULTURAL RESOURCES				
MM 5.9-1: Transmission Line Williamson Act Review (Kern County). Prior to the construction of the proposed transmission line route within any Williamson Act contracted lands in Kern County, the Applicant shall submit a written site description, along with a plot plan of the proposed transmission line route within the contracted land to the Kern County Planning Department for review and approval.	Submittal of documentation demonstrating approval from Kern County Planning Department	Prior to construction of transmission line	Applicant	LACDRP KCPD
VISUAL QUALITIES				
MM 5.10-1: Visual Screening During Construction. Prior to any construction activity within the vicinity of SR-138, temporary screening of construction and staging areas (e.g., via vegetation, or fencing with fabric or slats) shall be installed to minimize visual effects from construction as required by LACDRP.	Install temporary screening, as required and Maintain log to demonstrate compliance and Site inspection	Prior to construction activities within vicinity of SR-138	Applicant/Construction Manager	LACDRP
MM 5.10-2: Construction Housekeeping. During construction, the development site shall be maintained. The Project facility construction site and off-site transmission line route work areas shall be kept clean of debris, trash, or waste.	Maintain development site and Site inspection	During construction	Applicant/Construction Manager	LACDRP
MM 5.10-3: Building and Equipment Paint. All proposed on-site structures and appropriate equipment shall be neutral colors and non-	Submittal and approval of building and equipment paint	Prior to issuance of building permit	Applicant	LACDRP

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reflective, as approved by the LACDRP.	palette plans and information			
MM 5.10-4: Screening Vegetation Landscaping Plan and Maintenance. Prior to issuance of a grading permit, the Applicant shall submit a landscaping plan for the 10-foot-wide strip of Project screening vegetation proposed along both sides of SR-138, to the LACDRP for review and approval. The Plan shall be certified by a registered landscape architect, and shall identify use of temporary irrigation, and the areas on both sides of SR-138 at the Project site to be planted with Joshua trees and/or other native yucca species, and native shrub species, in compliance with the County Drought-Tolerant Landscaping Ordinance. The landscaping shall be installed within 14 months of the commencement of construction activities. The vegetation shall be maintained via selective thinning and removal of invasive weeds and monitored thereafter to promote successful, long-term establishment of the native vegetation to the satisfaction of LACDRP. The landscaped area shall also be maintained free of trash and debris for the Project lifetime to the satisfaction of LACDRP.	Submittal and approval of Screening Vegetation Landscaping Plan and Maintain log to demonstrate compliance and Site inspection	Prior to issuance of grading permit and During construction and operation	Applicant/Registered Landscape Architect/ Construction Manager	LACDRP
MM 5.10-5: Maintenance of SR-138 Caltrans and County Easements. The areas on both sides of the existing Caltrans right-of-way for SR-138 offered for dedication in fee simple by the Applicant to Caltrans and the irrevocable 10-foot-wide slope easement on both sides of the 200-foot-wide Caltrans right-of-way offered to the County as described in Section 4.2 of this EIR shall be maintained free of trash and debris on an as-needed basis to the satisfaction of LACDRP. The dedicated area for Caltrans shall be maintained by Applicant until such time the deed for the applicable area is transferred to Caltrans, and the slope easement area for the County	Maintain log to demonstrate compliance and Site inspection	During construction and operation, prior to deed transfer for Caltrans easement and prior to improvements by County for slope easement area	Applicant/Construction Manager	LACDRP

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shall be maintained by the Applicant until such time that the County installs improvements.				
TRAFFIC AND ACCESS				
MM 5.11-1: Provide Adequate Worksite Traffic Control. Prior to any construction activities and/or issuance of required encroachment permits from Caltrans and Los Angeles and Kern counties, the Applicant shall prepare worksite traffic control plans for review and approval from Caltrans, the LACDPW, and the Kern County Resource Management Agency, Roads Department. The plans shall include: 1) the location and usage of appropriate construction work warning signs that shall be placed in accordance with the California Manual on Uniform Traffic Control Devices (Caltrans 2010); 2) proper merging taper and/or shifting lane schematics; and 3) adequate work area and buffer zone designation as well as proper location and conduct of flagmen and the traffic management supervisor at the installation worksite area. The Project worksite traffic control plans shall be coordinated with driver and worker safety in mind. Where the observed speed limit on affected roadways is 55 MPH or more, the plans shall incorporate and implement the following minimum standard requirements per the Work Area Traffic Control Handbook (WATCH): • A Type C flashing arrow pane shall be used for each closed lane. • The minimum height for traffic cones shall be 28 inches. • A minimum of three advance warning signs shall be posted. • Consideration of advanced safety enhancement measures shall be taken into account for workers in the work zones. The above safety and traffic control measures identified in the traffic control plans shall also be implemented at pole installation sites within	Submittal and approval of Worksite Traffic Control Plans and Advance notification of road closures to LACFD and submittal of detour plans	Prior to issuance of grading permit or encroachment permit, where applicable and During construction	Applicant/Construction Manager	LACDRP LACDPW LACFD KCRD

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the public road ROW and/or roadway crossings at a minimum. Additionally, the County, including the LACFD Fire Stations 78, 112, and 140 shall be notified at least three days in advance of any street closures that may affect fire and/or paramedic responses in the area. Applicant shall provide alternate route (detour) plans to the County, including three sets to the LACFD, with a tentative schedule of planned closures, prior to the beginning of construction.				
MM 5.11-2: Document Pre-and Post-Project Construction Pavement Condition of 170th Street West and Pay Fair Share. Prior to issuance of a grading permit, Applicant shall document and submit all required information and/or material pertaining to the pavement conditions of 170th Street West including the formula for calculating the Project's fair share of any repair and/or reconstruction of 170th Street West to the satisfaction of the LACDPW. Applicant shall reimburse the County of Los Angeles for the cost of any repairs and/or reconstruction of 170th Street West attributable to the Project as agreed to by the LACDPW. The timing of any necessary repairs and/or reconstruction of 170th Street West and the required payment by Applicant shall be determined by LACDPW.	Submittal and approval of Pre-Construction Pavement Condition documentation and the Project's fair share formula and Submittal and approval of Post-Construction Pavement Condition documentation and Payment of fair share	Prior to issuance of grading permit and Following construction	Applicant/Construction Manager	LACDPW
MM 5.11-3: Limit 50 Percent of Truck Deliveries to Off-Peak Hours. During the construction phase of the Project, Applicant/EPC contractor shall require equipment and materials suppliers using trucks to make deliveries to the Project site such that at least 50	Maintain log to demonstrate compliance	During construction	Applicant/Construction Manager	LACDRP

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percent of associated truck traffic occurs during off-peak hours.				
ENVIRONMENTAL SAFETY				
MM 5.15-1: Additional assessment, and possibly remediation, of potentially contaminated soils on the Project site. Prior to the issuance of a grading permit, the Applicant shall obtain a site closure letter from the Los Angeles County Fire Department, Health Hazardous Materials Division. The Applicant shall conduct additional site assessment or remediation activities as required by and to the satisfaction of the Voluntary Oversight Program of the CUPA (Los Angeles County Fire Department, Health Hazardous Materials Division). Additional assessment and/or remediation may include the following: 1) Preparation of applicable Phase II Environmental Site Assessment Work Plans that describe the proposed approach and methods to be used in characterizing shallow soils. The Work Plans shall include the proposed sampling locations, sample collection procedures, analytical methods, quality control measures, and a site-specific health and safety plan. The Phase II ESA(s) shall be submitted to the CUPA for regulatory review and approval. 2) Implementation of the Phase II ESA Work Plan(s) with CUPA oversight. As necessary, Site Remediation Action Plans shall be developed. Upon CUPA concurrence with the recommendations presented the Phase II ESA(s), remedial action plans shall be prepared for submittal to the CUPA. The remedial action plans shall include the following. 1) Remediation goals and cleanup criteria.	Perform necessary assessment and remediation, as applicable, and obtain Site Closure Letter from LACFD	Prior to issuance of grading permit	Applicant	LACDRP LACFD (CUPA)

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2) Evaluation of corrective action alternatives that compares the effectiveness, feasibility, and cost benefit of each alternative. The remedial action plans shall take into account existing and proposed uses of the Project area. 3) Identification of the preferred alternative with consideration of protection of resources within the Project area. 4) A detailed description of the access points and haul-out routes for remedial activities; remediation methods and procedures; mitigation of dust; minimization or avoidance of disturbance to sensitive ecosystems; and verification soil sampling and analysis. Included in the discussion shall be information on disposal sites, transport and disposal methods, as well as recordkeeping methods for documenting remediation, regulatory compliance, and health and safety programs for on-site workers.				
MM 5.15-2: A Soil Management Plan for Transmission Line Construction. Prior to issuance of a grading permit, a soil management plan shall be submitted to the CUPA for review and approval. The plan shall include practices that are consistent with the California Title 8, Occupational Safety and Health Administration (Cal-OSHA) regulations, as well as CUPA remediation standards that are protective of the planned use. Appropriately trained construction personnel shall be present during site preparation, grading, and related earthwork activities (e.g., augering) to monitor soil conditions encountered. In order to confirm the absence or presence of hazardous substances associated with former land use, a sampling strategy may be implemented. The sampling strategy shall include procedures regarding logging/sampling and laboratory analyses. The Soil Management Plan shall outline guidelines for the following:	Submittal and approval of Soil Management Plan and Monitor soil conditions encountered	Prior to issuance of grading permit for the transmission line and During construction	Applicant/Construction Manager	LACFD (CUPA)

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• Identifying impacted soil • Assessing impacted soil • Soil excavation • Impacted soil storage • Verification sampling • Impacted soil characterization and disposal				
MM-5.15-3: The historic oil well that requires abandonment or re-abandonment shall be abandoned to current standards. Prior to issuance of a grading permit, an investigation into the location of the historic oil well, reportedly located on the proposed Project site shall be conducted. If the well is determined to be located on the Project site, the well shall be inspected. If the well was not abandoned properly, as determined by the California Division of Oil, Gas, and Geothermal Resources (DOGGR), the well shall be re-abandoned to the satisfaction of DOGGR. The Project development plans shall comply with the required setbacks from oil and gas wells as determined by DOGGR and the County of Los Angeles.	Investigation of historic oil well and If well is determined to be present on the Project site, obtain determination from DOGGR that historic well was properly abandoned or re-abandon the well to the satisfaction of DOGGR	Prior to issuance of grading permit	Applicant/Construction Manager	DOGGR
MM 5.15-4: Demolition Hazardous Building Materials Assessment and Management Plan. Prior to the commencement of any demolition activity on the Project site, the demolition Manager shall prepare a written Demolition Hazardous Building Materials Assessment and Management Program for review and approval by the CUPA, and/or other appropriate regulatory agency. The Demolition Hazardous Building Materials Management Program shall	Submittal and approval of Demolition Hazardous Building Materials Assessment and Management	Prior to commencement of any demolition activity	Applicant/Demolition Manager	LACFD (CUPA) AVAQMD

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include an assessment for lead-based paint (LBP) and asbestos-containing material (ACM) as identified in the URS pre-demolition survey report (URS 2010), and the following plans shall be prepared: • Lead-based Paint Abatement and Management Plan. A LBP Abatement Plan shall be prepared and implemented by a qualified Manager. Elements of the plan shall include the following: ▪ Containment of all work areas to prohibit off-site migration of paint chip debris. ▪ Removal or encapsulation of all peeling and stratified LBP on building surfaces and on non-building surfaces to the degree necessary to properly complete demolition activities per the recommendations of the survey. The demolition Manager shall properly contain and dispose of intact LBP on all equipment to be cut and/or removed during demolition. ▪ Providing on-site air monitoring during all abatement activities and perimeter monitoring to ensure no contamination of work of adjacent areas. ▪ Cleanup and/or HEPA vacuum paint chips. ▪ Collection, segregation, and profiling waste for disposal determination. ▪ Post-demolition testing of soil to assure that soil at the site is not contaminated by LBP. ▪ Providing for appropriate disposal of all waste. • Asbestos-containing Materials Abatement and Management Plan. Prior to demolition work that shall disturb identified ACMs, an ACM Abatement and Management Plan shall be prepared.	Program and Notification of demolition activities to AVAQMD and Maintain log to demonstrate compliance			

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Asbestos abatement shall be conducted during demolition activities, consistent with OSHA and air quality regulations. The Management plan shall include detailed information regarding ACM classification, ACM hazard assessment (the possibility of fiber release from ACM is based on the materials condition, such as friability), ACM inventory information, training and qualification for workers, demolition handling procedures, waste management and disposal procedures, and emergency response procedures (in case of a release of friable materials) licensed asbestos abatement removal Manager shall remove the ACMs under the oversight of a California Certified Asbestos Consultant. All identified ACMs shall be removed and appropriately disposed of by a state-certified asbestos Manager. The proposed Project shall include notification of demolition activities to the Antelope Valley Air Quality Management District.				
LAND USE				
Mitigation Measure 5.16-1: Tree Planting Modification. Prior to issuance of a grading permit, the applicant shall obtain authorization to modify the tree planting requirements of the Green Building Ordinance from the Director of Public Works and shall comply with all considerations and other terms of the Green Building Ordinance requirements to the satisfaction of the Director of Public Works (see Sections 22.52.2130.C.5 and Section 22.52.2150 of the County Code).	Obtain authorization to modify the tree planting requirements of the Green Building Ordinance	Prior to issuance of grading permit	Applicant	LACDPW
NOISE				
MM 5.18-1: Pile Driver Orientation. In order to reduce the noise levels generated by the vibratory pile driver and comply with all	Maintain log demonstrating	During construction	Applicant/Construction Manager	LACDRP

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applicable Los Angeles County noise standards, the pile driver shall be oriented such that the rear of the pile driver faces toward the noise-sensitive receptors when the vibratory pile driver is being utilized within 3,000 feet of the receptors.	compliance and Site inspection			
MM 5.18-2: Construction Equipment Use of Mufflers. Construction equipment and vehicles shall be fitted with efficient and well-maintained mufflers to reduce noise emission levels. In addition, the Project construction equipment and vehicles shall be maintained according to the manufacturers' instructions and recommendations.	Maintain log demonstrating compliance	During construction	Applicant/Construction Manager	LACDRP
MITIGATION COMPLIANCE				
As a means of ensuring compliance of the above mitigation measures, the Applicant and/or subsequent owner(s) are responsible for submitting an annual mitigation compliance report to the LACDRP for review, and for replenishing the mitigation monitoring account if necessary until such time as all mitigation measures have been implemented and completed.	Submittal of annual mitigation compliance report and Replenishing mitigation monitoring account	Annually until such time as all mitigation measures have been implemented and completed	Project Applicant and Subsequent Owner(s)	LACDRP

[1] List of Acronyms:

ACM	Asbestos-containing material
AQCMM	Air quality construction mitigation manager
ATCM	Airborne toxic control measure
AVAQMD	Antelope Valley Air Quality Management District
BLM	Bureau of Land Management
Cal-IPC	California Invasive Plant Council
Cal-OSHA	California Occupational Safety and Health Administration
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CBC	California Building Code
CCR	California Code of Regulations
CDFG	California Department of Fish and Game
CEQA	California Environmental Quality Act
CRHR	California Register of Historic Resources
CUPA	Certified Unified Program Agency
DEIR	Draft Environmental Impact Report
DOGGR	California Division of Oil, Gas, and Geothermal Resources
DPR	Department of Parks and Recreation
EIR	Environmental Impact Report

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EPC	Engineering, procurement, and construction
ESA	Environmental Site Assessment
°F	Fahrenheit
FEMA	Federal Emergency Management Agency
FDECP	Fugitive dust emission control plan
HEPA	high efficiency particulate air
HEVMP	Habitat enhancement and vegetation management plan
hp	Horsepower
KCPD	Kern County Planning Department
KCRD	Kern County Roads Department
kV	Kilovolts (unit of electrical potential)
LACDPH	Los Angeles County Department of Health Services, Public Health
LACDPW	Los Angeles County Department of Public Works
LACDRP	Los Angeles County Department of Regional Planning
LACFD	Los Angeles County Fire Department
LBP	Lead-based paint
LRWQCB	Lahontan Regional Water Quality Control Board
mph	Miles per hour
MM	Mitigation Measure
MW	Megawatt
NAHC	Native American Heritage Commission
NIOSH	National Institute for Occupational Safety and Health
NO_X	Oxides of Nitrogen
NPDES	National Pollutant Discharge Elimination System
OSHA	Occupational Safety and Health Administration
OWTS	On-site Wastewater Treatment System
PM	Particulate Matter
RWQCB	Regional Water Quality Control Board
SEA	Significant ecological area
SR	State Route
UCLA	University of California Los Angeles
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
WATCH	Work Area Traffic Control Handbook (Caltrans)

[2] The proposed Project consists of the approximately 2,100-acre solar facility site and the off-site 230-kV transmission line in northern Los Angeles County and southern Kern County.