Groundwater Monitoring Program
CSD Section E.19

Third Quarter 2014
Groundwater Monitoring Results

Freeport-McMoRan Oil & Gas
Inglewood Oil Field

October 15, 2014

ENVIRON

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Acronyms

BOD5	Biochemical Oxygen Demand 5
BTEX	Benzene, Toluene, Ethylbenzene, and Xylenes
COC	chain-of-custody
County	Los Angeles County Board of Supervisors
CSD	Community Standards District
DTSC	Department of Toxic Substance Control
EPA	Environmental Protection Agency
FM O&G	Freeport-McMoRan Oil & Gas
LARWQCB	Los Angeles Regional Water Quality Control Board
m	meters
MCL	Maximum Containment Level
MTBE	Methyl Tert-Butyl Ether
ppb	parts per billion
Site	Inglewood Oil Field
TDS	Total Dissolved Solids
TPH-DRO	Total Petroleum Hydrocarbons as Diesel Range Organics
TRPH	Total Recoverable Petroleum Hydrocarbons

Professional Certification

Groundwater Monitoring Program
CSD Section E.19

Third Quarter 2014 Groundwater Monitoring Results

Inglewood Oil Field
Los Angeles, California

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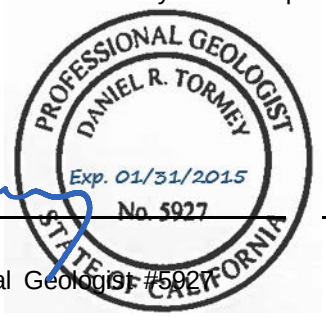

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1 Introduction

ENVIRON was retained by Freeport-McMoRan Oil & Gas (FM O&G) to prepare this report to describe the results of the groundwater monitoring activities conducted during the Third Quarter 2014 at the Inglewood Oil Field (site) which is located in the Baldwin Hills area of Los Angeles County as depicted in Figure 1.

The Los Angeles County Board of Supervisors (County) approved the Baldwin Hills Community Standards District (Baldwin Hills CSD) to establish regulations, safeguards, and controls for FM O&G's proposed drilling and oil production over the next 20 years. The Baldwin Hills CSD and the Los Angeles Regional Water Quality Control Board (LARWQCB) requested a groundwater-monitoring network to evaluate potential impacts associated with the site. Specifically, the LARWQCB requested that the network focus on preferred pathways in native canyon areas and suggested existing catch basins as likely target locations for the monitoring wells to determine impacts of oil field operations on groundwater quality.

The purpose of this report is to present the results for the quarterly monitoring and sampling activities in accordance with the approved *Groundwater Monitoring Program and Workplan, Inglewood Oil Field, CSD Section E.19*. The monitor wells to meet this purpose include MW-3, MW-4A, MW-4B, MW-4C, and MW-5, MW-6, and MW-7. The objective of the monitoring is to evaluate potential impacts to groundwater quality associated with the increased field operations. The monitor well locations are presented in Figure 2.

The remainder of this document is organized as follows:

> Chapter 2 describes the environmental setting;

> Chapter 3 describes the groundwater monitoring methods;

> Chapter 4 presents the results of the groundwater monitoring activities; and,

> Chapter 5 presents the reference list.

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2 Environmental Setting

2.1 Geology

Numerous studies of the Baldwin Hills have concluded that the uplift of the Baldwin Hills has disconnected water-bearing sediments from groundwater supplies in the Los Angeles Basin, and that the formations are folded, faulted, and the limited supply potential is not appropriate for a water supply (DWR 1961, LARWQCB 2001, USGS 2003, Los Angeles County 2008). The prominent aquifer systems in the subsurface of the Los Angeles Basin are actually exposed at the surface in the Baldwin Hills, as is the Pico Formation, which is typically taken as the base of the fresh water supply aquifers (DWR 1961, USGS 2003). In groundwater models of freshwater flow in the Los Angeles Basin aquifer systems (USGS 2003), the Baldwin Hills is modeled as a “no flow” zone; that is, since the sediments beneath the Baldwin Hills are disconnected from the regional aquifers, groundwater flow is discontinuous across the Baldwin Hills. The following information summarizes the topographic, geologic, and hydrogeologic data that leads to these findings.

2.2 Topography and Drainage

The site is located in the Baldwin Hills, which form part of a chain of low hills along the Newport-Inglewood Fault Zone. The Baldwin Hills are the highest of the hills along this fault zone, reaching a height of 511 feet (153 meters [m]) above mean sea level. Sediments of the Baldwin Hills have been considerably warped and faulted. The north flank of the Baldwin Hills has been deeply incised by erosion, whereas the south flank slopes gently to the Torrance Plain and Rosecrans Hills.

No perennial or intermittent streams, as defined by the U.S. Geological Survey, are present within the field boundaries (Los Angeles County 2008). Surface runoff occurs primarily as sheetflow across drilling pads, structure pads, and slopes eventually flowing into ephemeral gullies and drainage ditches. Five surface water catch basins are located along these drainages within the CSD boundary to regulate discharge from the site and retain oil on-site in an event of a spill. The catch basins are depicted in Figure 2 and are identified as follows:

- LAI Basin;
- Stocker Basin;
- Vickers I Basin;
- Lower Vickers II Basin; and,
- Upper Vickers II Basin.

Runoff from these basins is discharged to the Los Angeles County storm drain system. Two of the basins, LAI and Stocker, ultimately discharge through the storm drain system into Centinela Creek, which then discharges to Ballona Creek. Centinela Creek is located approximately 1.2 miles southwest of the active, surface field boundary. The other three basins, Lower Vickers II, Upper Vickers II and Vickers I, discharge to the storm drain system, ultimately reaching Ballona Creek, which is located approximately 0.2 mile south of the active, surface field boundary at the closet point.

2.3 Site Hydrogeology

The Baldwin Hills are generally comprised of non-waterbearing strata that straddle the West Coast, Central, and Santa Monica groundwater basins. Groundwater within the Baldwin Hills, where present, is limited to perched zones located within canyon alluvium and weathered bedrock (DWR 1961, LARWQCB 2001). There are no domestic or industrial water supply wells located within the active surface field boundary, or within one mile of the Baldwin Hills.

The Baldwin Hills are underlain by a faulted, northwest-trending anticline, which is developed in sediments of Tertiary and Pleistocene age. Two principal northwesterly trending, nearly parallel faults offset the central portion of the hills, developing a downdropped block or graben across the crest of the anticline. The more easterly of the two structures is the Newport-Inglewood fault; the other fault is unnamed. Both faults are offset by secondary cross faults that trend northeast. The block east of the Newport-Inglewood fault is composed of sediments of Pliocene age and older and is cut by several small unnamed faults. One such fault extends along the northeast border of the Baldwin Hills and may be related to the prominent escarpment in that area. The Slauson Avenue fault extends northeast beyond the Baldwin Hills and offsets aquifers of the San Pedro formation. The Baldwin Hills form a complete barrier to ground water movement where the essentially nonwater-bearing Pico formation crops out. The Pico Formation is typically taken as the base of the freshwater zone across the Los Angeles Basin.

Potable groundwater aquifers of the Los Angeles Basin lie adjacent to the Baldwin Hills. Based on a hydrogeologic cross section completed along Ballona Creek (USGS 2003), the base of fresh water is highly variable as a result of faulting along the Newport-Inglewood Fault Zone. Along the north-northwest boundary of the Baldwin Hills, west of the Newport-Inglewood Fault Zone, groundwater is present in the Silverado Aquifer to a depth of 200 to 300 feet. Further west from the fault zone, the Silverado Aquifer thickens and groundwater is present to a depth of approximately 450 feet. The essentially non-waterbearing Pico Formation, commonly taken as the base of the fresh water aquifers, lies below the Silverado Formation (DWR 1961). East of the Newport-Inglewood Fault Zone and the Baldwin Hills, the base of fresh water is much deeper than west of the fault and numerous aquifers are present. Golden State Water Company Sentney Well #8 (State well No. 2S/14W/Sec 5/D08 or County well No. 2626P), located east of the fault zone, along Ballona Creek and approximately 1.2 miles north of the active surface field boundary, produces water from five separate stratigraphic intervals within aquifers at depths ranging from 70 to 370 feet. These depths correspond to the Exposition, Gage, Lynwood, and Silverado aquifers. Similar to west of the fault zone, the non-waterbearing Pico Formation lies below the Silverado Aquifer (DWR 1961).

Within the site, localized, perched groundwater has been measured at depths ranging from approximately 25 to 200+ feet bgs. Based on existing information, groundwater within this upper waterbearing formation is an unsaturated zone with localized perched water-bearing zones that are not continuous across the Baldwin Hills, and are not connected to the regional aquifer systems in the Los Angeles Basin. Because of this lack of water, the geological formations beneath the Baldwin Hills are not suitable for water supply (DWR 1961, USGS 2003, County of Los Angeles 2008).

3 Groundwater Monitoring Methods

This section summarizes the methods utilized during the groundwater monitoring activities. The monitoring activities proceeded in accordance with the Groundwater Monitoring Program and Workplan, Inglewood Oil Field, CSD Section E.19. The field activities and sampling methods are described in detail below.

3.1 Monitor Well Array

The objective of the groundwater monitoring program is to evaluate and monitor groundwater resources that may be affected by increased oil field operations. The monitor wells for this purpose were placed down-gradient of the catch basins on the site. The catch basins and associated monitor well are presented in Figure 2 and as follows:

- LAI Basin (MW-3);
- Stocker Basin (MW-4a, MW-4b, MW-4c);
- Vickers I Basin (MW-5);
- Lower Vickers II Basin (MW-6); and,
- Upper Vickers II Basin (MW-7).

3.2 Groundwater Monitoring and Sampling

The groundwater monitoring activities included the collection of depth-to-water measurements at each well and the collection of groundwater samples for chemical analysis. Activities were conducted on August 21, 2014, in accordance with the U.S. Environmental Protection Agency's (EPA) *Standard Operating Procedures for the Standard/Well-Volume Method for Collecting Ground-Water Samples* (May 2002), and in conformance with the general procedures outlined below. All equipment used for well evacuation and sampling was thoroughly washed with tap water, laboratory detergent (Alconox) and rinsed with purified deionized water prior to and after use.

3.2.1 Water Level Monitoring

Prior to purging and sampling each well, an electronic water level probe was used to measure depth-to-water and total depth in each well. Multiple measurements of water level were collected from a surveyed reference point (the top of the well casing) at each well, and purging and sampling was not performed until three successive readings had stabilized to within 0.01 foot. All water levels and total depth measurements were taken to the nearest 0.01 foot, and all measurements were recorded on field data sheets.

3.2.2 Well Purging

Prior to collecting a groundwater sample, each well was purged until dewatered or at least three casing volumes of groundwater were removed. In the case of dewatered wells, a sample was collected when recharge had restored the water column to 80 percent of the original height. The pH, turbidity, specific conductivity, and temperature of the purged water were measured during well purging as a measure of the aquifer conditions. Stability was considered to be achieved when the following conditions were met:

- The well was dewatered; or
- At least three casing volumes of water were removed;

- Sequential readings of pH taken greater than 0.5 casing volumes apart were within 0.1 pH unit; and,
- Sequential readings of specific conductivity taken greater than 0.5 casing volumes apart were within 3 percent; and,
- Sequential readings of turbidity taken greater than 0.5 casing volumes apart were below 10 nephelometric turbidity units (NTU) or within 10 percent.

A Grundfos® submersible pump was used to purge the monitor wells. Purge water was transferred to 55-gallon drums located in a secure area at the project site for subsequent processing through the facility's treatment and disposal system. The field measurements were recorded on Well Monitoring Data Sheets that are provided in Appendix A. The stabilized water quality parameters for each well are presented in Table 2.

3.2.3 Groundwater Sample Collection and Analysis

All sample containers were labeled using a waterproof marker and the label was affixed to the containers immediately before samples were taken for each individual well. Sample labels included the sampler's initials, location ID, time, analyses to be performed, and the preservation method used.

A clean pair of nitrile gloves was worn for sample collection at each well. Samples were collected from each well immediately after purging. Groundwater was sampled using a disposable bailer equipped with a bottom-emptying device, which allowed emptying the bailer from the bottom at a slow, controlled rate. The groundwater samples were decanted into the appropriate sample containers for each analyte. The sample containers were chemically preserved by the laboratory prior to the field activities. Samples collected for volatile organics analyses were handled with extra care to minimize any turbulence or aeration when filling the bottles. The bottles and caps were overfilled to form a convex meniscus and after collection, the sample container was inverted to check for the presence of air in the sample. If an air bubble was present, the sample was opened and the procedure repeated.

All samples were placed in individual Ziploc®-type bags, sealed, and stored in coolers on ice to maintain samples at 4°C prior to and during shipment to the analytical laboratory. Ice was sealed in double plastic bags. A chain-of-custody manifest was completed on-site and accompanied the samples to the lab. The samples were transferred to the laboratory within 24 hours of sampling.

All samples were analyzed for:

- Total Petroleum Hydrocarbons as Diesel Range Organics (TPH-DRO) by EPA Method 8015M;
- pH units by EPA Method 150.2;
- Total Recoverable Petroleum Hydrocarbons (TRPH) by EPA Method 418.1;
- Total Dissolved Solids (TDS) by USEPA method SM2540C;
- Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX) and Methyl Tert-Butyl Ether (MTBE) by EPA Method 8260B;
- Metals by the EPA 200 series;
- Biochemical Oxygen Demand 5 (BOD5) by EPA method 405.1; and,
- Nitrate and Nitrite by Ion Chromatography.

In addition, all samples were also analyzed for TPH-DRO with the silica gel filtering method, which removes hydrocarbons with a non-petroleum origin such as natural alcohols and other short chain organic molecules. All samples were analyzed by American Analytics, a state-certified laboratory located in Chatsworth, California, with the exception of BOD5, which was analyzed by American Environmental

Testing Laboratory in Burbank, California. Strict chain-of-custody (COC) procedures were maintained for all samples collected.

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4 Groundwater Monitoring Results

The results of the Third Quarter 2014 groundwater monitoring event are presented below.

4.1 Groundwater Results

Groundwater sampling was conducted on August 21, 2014, and involved the collection of samples from monitor wells MW-6 and MW-7. Monitor wells MW-3, MW-4A, MW-4B, MW-4C, and MW-5 were dry or contained insufficient water at the time of monitoring, so no sample was collected from these wells.

4.1.1 Groundwater Elevations

The groundwater elevation data presented in Table 1 indicates that there are several discontinuous perched zones across the site. This finding is consistent with results of the prior groundwater sampling events as well as other studies of the site, which determined that the water-bearing zones in the Baldwin Hills are internally discontinuous, as well as discontinuous with water supply aquifers elsewhere in the Los Angeles Basin.

4.1.2 Groundwater Analytical Results

The following analytes were detected in monitor wells MW-6 and MW-7:

> **MW-6.** TDS was measured at 2,300 mg/L, pH was measured at 6.8, TPH-DRO was detected at a concentration of 0.70 mg/L prior to silica gel filtering and less than the 0.10 mg/L detection limit after, nitrate was detected at a concentration of 1.3 mg/L, and BOD5 was measured at 44.7 mg/L.

> **MW-7.** TDS was measured at 2,400 mg/L, pH was measured at 6.7, TPH-DRO was detected at a concentration of 0.46 mg/L prior to silica gel filtering and less than the 0.10 mg/L detection limit after, nitrate was detected at a concentration of 5.0 mg/L, and BOD5 was measured at 33.3 mg/L.

The analytical results were all below the established state Maximum Containment Level (MCL) for drinking water standards. The results are summarized in Tables 3 and 4. Table 5 presents the cumulative analytical results and monitoring data collected since April 2010 and charts plotting TPH-DRO concentrations and groundwater elevation are attached in Appendix B. Laboratory reports are provided in Appendix C.

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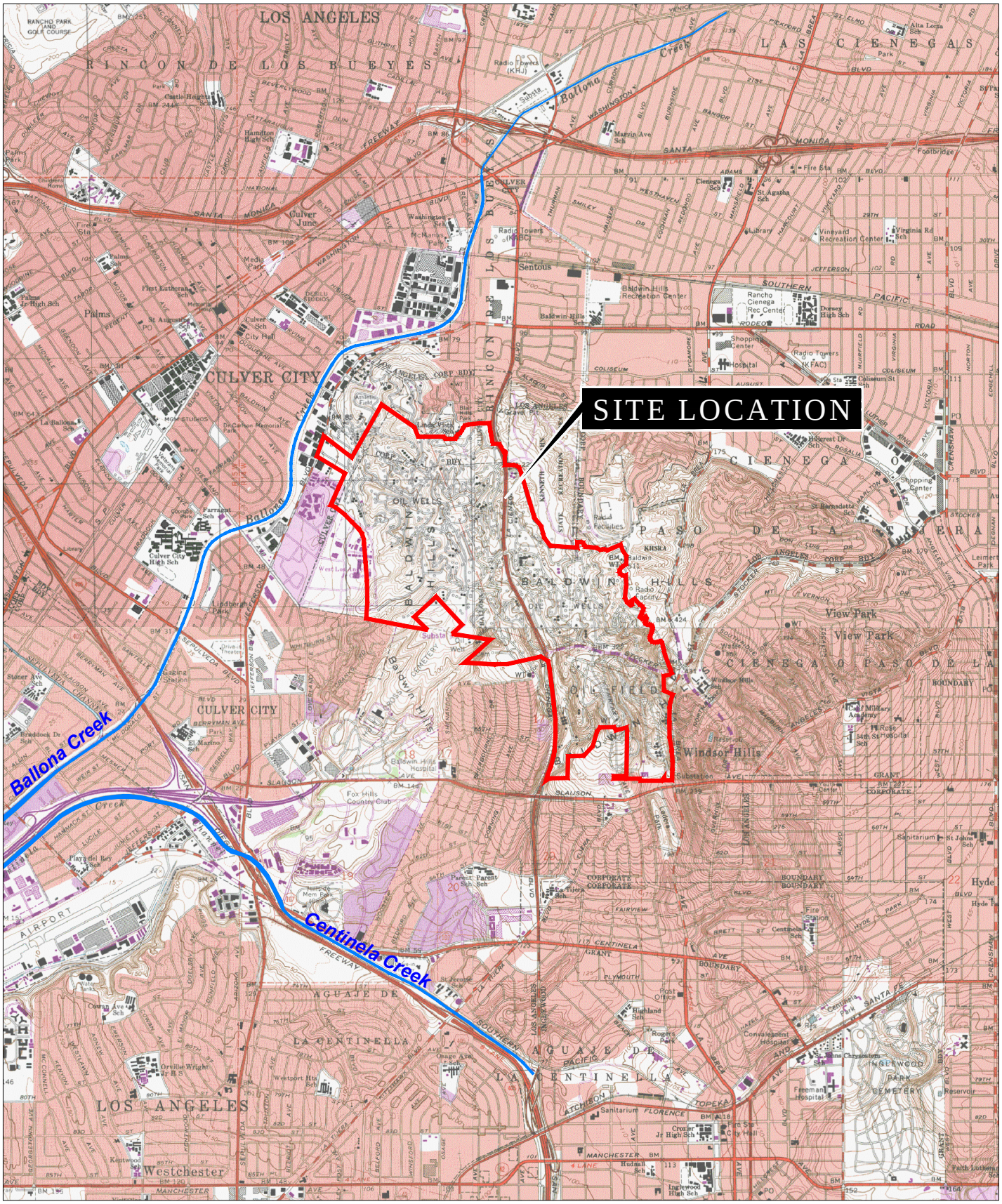
FIGURES



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Regional Location Map

Freeport–McMoRan Oil & Gas
Inglewood Oil Field

NOT TO SCALE	PROJECT No. 0534271A	FIGURE. No. 1	DATE 7/13

LEGEND

- RETENTION BASIN
- MONITOR WELL LOCATION
- CSD BOUNDARY

GROUNDWATER ELEVATION (MSL)

- 160 – 130 FEET
- 130 – 100 FEET
- <100 FEET
- DRY (TOTAL DEPTH–MSL)

N

0 1350 2700

GRAPHIC SCALE IN FEET

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Monitor Well Location Map and Groundwater Elevations

Freeport–McMoRan Oil & Gas
Inglewood Oil Field

Scale 1:1250	PROJECT No. 0534271A	FIGURE. No. 2	DATE 10/14

TABLES

TABLE 1

Third Quarter 2014

Groundwater Elevation Data

Freeport-McMoRan Oil & Gas - Inglewood Oil Field

Los Angeles, California

Well ID	Date	Wellhead Elevation	Depth-to-Water	Groundwater Elevation
		(feet msl)	(feet btoc)	(feet msl)
MW-3	8/21/2014	197.51	Dry	---
MW-4a	8/21/2014	230.28	Dry	---
MW-4b	8/21/2014	230.30	Dry	---
MW-4c	8/21/2014	230.63	Dry	---
MW-5	8/21/2014	172.82	Dry	---
MW-6	8/21/2014	97.62	63.59	34.03
MW-7	8/21/2014	186.18	48.11	138.07

NOTES:

btoc = below top of casing

msl = mean sea level

TABLE 2
Third Quarter 2014
Stabilized Groundwater Quality Sampling Parameters
Freeport-McMoRan Oil & Gas - Inglewood Oil Field
Los Angeles, California

Monitoring Well	Sampling Date	Well Diameter	Volume Purged	Temperature	pH	Electrical Conductivity	Turbidity	Comments
		(inches)	(gal)	(°C)	(standard units)	(uS/cm)	(NTUs)	
MW-3	8/21/2014	2	---	---	---	---	---	Dry
MW-4a	8/21/2014	2	---	---	---	---	---	Dry
MW-4b	8/21/2014	2	---	---	---	---	---	Dry
MW-4c	8/21/2014	2	---	---	---	---	---	Dry
MW-5	8/21/2014	2	---	---	---	---	---	Dry
MW-6	8/21/2014	2	5.5	25.1	7.0	3,761	30	
MW-7	8/21/2014	2	4.9	25.1	6.6	2,468	59	

NOTES:
MW- 3, 4A, 4B, 4C, and 5 contained insufficient water for purging or sampling
Samples were filtered with 0.45 micron filter while sampling (Turbidity values reduced to approximately 15 NTU's)

TABLE 3

Third Quarter 2014

Groundwater Analytical Results

TPH, VOCs, and TRPH

Freeport-McMoRan Oil & Gas - Inglewood Oil Field

Los Angeles, California

Sample Location	Date Collected	TPH-DRO	TPH-DRO (w/Silica Gel Filtering)	VOCs					TRPH
				Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE	
		C_{10}-C_{28}	C_{10}-C_{28}						
		(mg/L)	(mg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(mg/L)
MW-6	8/21/2014	0.70	<0.10	<0.50	<0.50	<0.50	<1.5	<2.0	<5.0
MW-7	8/21/2014	0.46	<0.10	<0.50	<0.50	<0.50	<1.5	<2.0	<5.0

Notes:

<# indicates compound was not detected above the indicated method reporting limit.

µg/L = micrograms per liter.

mg/L = milligrams per liter.

MW- 3, 4A, 4B, 4C, and 5 contained insufficient water for purging or sampling

All samples analyzed by American Analytics, Chatsworth, CA.

TPH-DRO = Diesel Range Organics as part of Total Petroleum Hydrocarbon with carbon chain differentiation by EPA Method 8015M

VOCs = Volatile Organic Compounds by EPA Method 8260B

MTBE = Methyl-tert-Butyl Ether

TRPH = Total Recoverable Petroleum Hydrocarbons by EPA Method 418.1

TABLE 4
Third Quarter 2014
Groundwater Analytical Results
Metals, Nitrate, Nitrite, BOD5, TDS, and pH
Freeport-McMoRan Oil & Gas - Inglewood Oil Field
Los Angeles, California

Sample Location	Date Collected	Nitrate	Nitrite	Metals							BOD5	Total Dissolved Solids (TDS)	pH
				Arsenic	Barium	Chromium	Cobalt	Copper	Lead	Zinc			
		(mg/L)	(mg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(mg/L)	(mg/L)	
MW-6	8/21/2014	1.3	<3.0	<7.0	<100	<10	<50	<25	<10	<50	44.7	2,300	6.8
MW-7	8/21/2014	5.0	<3.0	<7.0	<100	<10	<50	<25	<10	<50	33.3	2,400	6.7

Notes:
<# indicates compound was not detected above the indicated method reporting limit.
µg/L = micrograms per liter.
mg/L = milligrams per liter.
MW- 3, 4A, 4B, 4C, and 5 contained insufficient water for purging or sampling
All samples analyzed by American Analytics, Chatsworth, CA with the exception of BOD5 analyzed by American Environmental Testing Laboratory, Burbank, CA
EPA = United States Environmental Protection Agency
BOD5 20C = Biochemical Oxygen Demand at 20°C by EPA Method 405.1
Nitrate/Nitrite by Ion Chromatography (EPA Method 300)
Metals by EPA Method 6010B
TDS = Total Dissolved Solids by EPA Method SM2540C
PH by EPA Method 150.1

TABLE 5
Historical Groundwater Analytical Data
Freeport-McMoRan Oil & Gas- Inglewood Oil Field
Los Angeles, California

Well ID	Date	TPH-DRO	TPH-DRO (w/Silica Gel Filtering)	BTEX/MtBE	Total Recoverable Petroleum Hydrocarbons (TRPH)	Total Dissolved Solids (TDS)	Nitrate and Nitrite	Metals	BOD5	COMMENTS
		C_{10}-C_{28}	C_{10}-C_{28}							
		(mg/L)	(mg/L)	(µg/L)	(mg/L)	(mg/L)	(mg/L)	(µg/L)	(mg/L)	
MW-3	Apr-10	1.3	0.14	0.95 toluene	<5.0	900	NA	NA	NA	
	Jun-10	1.4	<0.10	0.76 toluene	<5.0	780	NA	NA	NA	
	Sep-10	NS	NS	NS	NS	NS	NS	NS	NS	Insufficient Water
	Dec-10	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
	Mar-11	1.1	<0.10	5.8 toluene	<5.0	1100	Below Detection Limit	33 arsenic	40.1	
	Jun-11	1.3	0.18	Below Detection Limit	<5.0	850	<0.20	28 arsenic	50.5	
	Sep-11	NS	NS	NS	NS	NS	NS	NS	NS	Insufficient Water
	Nov-11	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
	Feb-12	2.1	0.34	0.85 benzene, 0.57 toluene, 0.5 ethylbenzene, 1.73 xylenes	<5.0	760	Below Detection Limit	37 arsenic, 130 barium, 32 chromium, 36 copper, 4.2 lead, 88 zinc	43.4	
	Apr-12	1.3	0.19	Below Detection Limit	<5.0	810	Below Detection Limit	28 arsenic, 73 barium, 15 chromium, 19 copper, 79 zinc	40.9	
	Aug-12	0.99	0.23	Below Detection Limit	<5.0	764	0.1 nitrate	29 arsenic, 16 zinc	Feb-00	
	Nov-12	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
	Feb-13	0.73	<0.10	Below Detection Limit	<5.0	880	Below Detection Limit	32 arsenic	52.1	
	May-13	0.78	<0.10	Below Detection Limit	<5.0	910	Below Detection Limit	28 arsenic	57.6	
	Aug-13	NS	NS	NS	NS	NS	NS	NS	NS	Insufficient Water
	Nov-13	NS	NS	NS	NS	NS	NS	NS	NS	Insufficient Water
	Mar-14	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
	May-14	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
	Aug-14	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
MW-4a	Apr-10	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
	Jun-10	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
	Sep-10	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
	Dec-10	NS	NS	NS	NS	NS	NS	NS	NS	Insufficient Water
	Mar-11	NS	NS	NS	NS	NS	NS	NS	NS	Insufficient Water
	Jun-11	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
	Sep-11	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
	Nov-11	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
	Feb-12	NS	NS	NS	NS	NS	NS	NS	NS	Insufficient Water
	Apr-12	NS	NS	NS	NS	NS	NS	NS	NS	Insufficient Water
	Aug-12	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
	Nov-12	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
	Feb-13	NS	NS	NS	NS	NS	NS	NS	NS	Insufficient Water
	May-13	NS	NS	NS	NS	NS	NS	NS	NS	Insufficient Water
	Aug-13	NS	NS	NS	NS	NS	NS	NS	NS	Insufficient Water
	Nov-13	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
	Mar-14	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
	May-14	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
	Aug-14	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
MW-4b	Apr-10	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
	Jun-10	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
	Sep-10	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
	Dec-10	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
	Mar-11	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
	Jun-11	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
	Sep-11	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
	Nov-11	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
	Feb-12	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
	Apr-12	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
	Aug-12	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
	Nov-12	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
	Feb-13	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
	May-13	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
	Aug-13	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
	Nov-13	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
	Mar-14	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
	May-14	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
	Aug-14	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry

TABLE 5
Historical Groundwater Analytical Data
Freeport-McMoRan Oil & Gas- Inglewood Oil Field
Los Angeles, California

Well ID	Date	TPH-DRO	TPH-DRO (w/Silica Gel Filtering)	BTEX/MtBE	Total Recoverable Petroleum Hydrocarbons (TRPH)	Total Dissolved Solids (TDS)	Nitrate and Nitrite	Metals	BOD5	COMMENTS
		C_{10}-C_{28}	C_{10}-C_{28}							
		(mg/L)	(mg/L)	(µg/L)	(mg/L)	(mg/L)	(mg/L)	(µg/L)	(mg/L)	
MW-4c	Apr-10	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
	Jun-10	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
	Sep-10	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
	Dec-10	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
	Mar-11	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
	Jun-11	NS	NN	NS	NS	NS	NS	NS	NS	Well Dry
	Sep-11	NS	NN	NS	NS	NS	NS	NS	NS	Well Dry
	Nov-11	NS	NN	NS	NS	NS	NS	NS	NS	Well Dry
	Feb-12	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
	Apr-12	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
	Aug-12	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
	Nov-12	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
	Feb-13	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
	May-13	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
	Aug-13	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
	Nov-13	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
	Mar-14	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
	May-14	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
	Aug-14	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
MW-5	Apr-10	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
	Jun-10	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
	Sep-10	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
	Dec-10	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
	Mar-11	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
	Jun-11	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
	Sep-11	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
	Nov-11	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
	Feb-12	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
	Apr-12	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
	Aug-12	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
	Nov-12	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
	Feb-13	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
	May-13	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
	Aug-13	NS	NS	NS	NS	NS	NS	NS	NS	Insufficient Water
	Nov-13	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
	Mar-14	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
	May-14	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
	Aug-14	NS	NS	NS	NS	NS	NS	NS	NS	Well Dry
MW-6	Apr-10	0.52	<0.10	Below Detection Limit	<5.0	2,300	NA	NA	NA	
	Jun-10	0.48	<0.10	0.62 toluene	<5.0	2,700	NA	NA	NA	
	Sep-10	1.20	<0.050	7.2 toluene	<5.0	2,500	Below Detection Limit	70 barium, 22 zinc	49.2	
	Dec-10	0.31	<0.10	7.4 toluene	7.1	2,500	5.3 nitrate	70 barium	49.5	
	Mar-11	0.34	<0.10	5.9 toluene	<5.0	2,300	Below Detection Limit	72 barium	33.8	
	Jun-11	0.42	<0.10	Below Detection Limit	<5.0	2,500	<0.50	Below Detection Limit	37.4	
	Sep-11	0.42	<0.10	2.0 toluene	<5.0	2,200	Below Detection Limit	51 barium, 23 zinc	34.1	
	Nov-11	0.34	<0.10	Below Detection Limit	<5.0	2,000	Below Detection Limit	56 barium	30.4	
	Feb-12	<0.10	<0.10	<0.50	<5.0	1,600				
	Apr-12	0.40	<0.10	Below Detection Limit	<5.0	2,200	Below Detection Limit	60 barium	36.7	
	Aug-12	0.36	<0.10	Below Detection Limit	<5.0	2,580	Below Detection Limit	64 barium	38.8	
	Nov-12	0.42	<0.10	Below Detection Limit	<5.0	1,400	Below Detection Limit	61 barium	23.2	
	Feb-13	0.36	<0.10	Below Detection Limit	<5.0	2,600	Below Detection Limit	Below Detection Limit	41.6	
	May-13	0.24	<0.10	Below Detection Limit	<5.0	2,500	Below Detection Limit	Below Detection Limit	63.0	
	Aug-13	0.40	<0.10	Below Detection Limit	<5.0	2,500	0.65 nitrate	52 barium	23.0	
	Nov-13	0.36	<0.10	Below Detection Limit	<5.0	2,400	0.61 nitrate	Below Detection Limit	50.7	
	Mar-14	0.42	<0.10	Below Detection Limit	<5.0	2,800	Below Detection Limit	Below Detection Limit	43.1	
	May-14	0.44	<0.10	Below Detection Limit	<5.0	2,600	Below Detection Limit	Below Detection Limit	37.4	
	Aug-14	0.70	<0.10	Below Detection Limit	<5.0	2,300	1.3 nitrate	Below Detection Limit	44.7	
MW-7	Apr-10	0.21	<0.10	0.58 toluene	<5.0	1,100	NA	NA	NA	
	Jun-10	0.29	<0.10	0.86 toluene	<5.0	1,100	NA	NA	NA	

TABLE 5

Historical Groundwater Analytical Data

Freeport-McMoRan Oil & Gas- Inglewood Oil Field

Los Angeles, California

Well ID	Date	TPH-DRO	TPH-DRO (w/Silica Gel Filtering)	BTEX/MtBE	Total Recoverable Petroleum Hydrocarbons (TRPH)	Total Dissolved Solids (TDS)	Nitrate and Nitrite	Metals	BOD5	COMMENTS
		C_{10}-C_{28}	C_{10}-C_{28}							
		(mg/L)	(mg/L)	(µg/L)	(mg/L)	(mg/L)	(mg/L)	(µg/L)	(mg/L)	
	Sep-10	0.48	<0.050	18 toluene	<5.0	2,000	6.9 nitrate	3.2 arsenic, 40 barium, 5.7 cobalt, 28 zinc	20.7	
	Dec-10	0.25	<0.10	11 toluene	<5.0	2,200	6.0 nitrate	45 barium	35.1	
	Mar-11	0.18	<0.10	6.4 toluene	<5.0	1,400	5.0 nitrate	Below Detection Limit	15.2	
	Jun-11	0.25	<0.10	Below Detection Limit	<5.0	1,200	7.0 nitrate	Below Detection Limit	22	
	Sep-11	0.35	<0.10	2.7 toluene	<5.0	2,700	5.3 nitrate	48 barium	32.8	
	Nov-11	0.29	<0.10	Below Detection Limit	<5.0	2,500	3.8 nitrate	60 barium	25.6	
	Feb-12	0.29	0.15	Below Detection Limit	<5.0	1,000	5.5 nitrate	26 barium, 2.7 chromium	14.6	
	Apr-12	0.12	<0.10	Below Detection Limit	<5.0	510	Below Detection Limit	3.0 chromium, 5.7 copper	11.8	
	Aug-12	0.15	<0.10	Below Detection Limit	<5.0	1,640	7.15 nitrate	35 barium	22.9	
	Nov-12	0.26	<0.10	Below Detection Limit	<5.0	1,200	5.0 nitrate	3.0 arsenic, 50 Barium	12.7	
	Feb-13	0.16	<0.10	Below Detection Limit	<5.0	1,600	3.7 nitrate	Below Detection Limit	21.5	
	May-13	<0.10	<0.10	Below Detection Limit	<5.0	2,000	6.4 nitrate	Below Detection Limit	37.8	
	Aug-13	0.32	<0.10	Below Detection Limit	<5.0	2,500	7.1 nitrate	33 barium	14.3	
	Nov-13	0.3	<0.10	Below Detection Limit	<5.0	2,200	2.3 nitrate	Below Detection Limit	24.9	
	Mar-14	0.39	<0.10	Below Detection Limit	<5.0	3,200	3.8 nitrate	Below Detection Limit	33.5	
	May-14	0.39	<0.10	Below Detection Limit	<5.0	1,900	7.9 nitrate	Below Detection Limit	35.3	
	Aug-14	0.46	<0.10	Below Detection Limit	<5.0	2,400	5.0 nitrate	Below Detection Limit	33.3	

Notes:

<# indicates compound was not detected above the indicated method reporting limit.

mg/L= milligrams per liter.

All samples analyzed by American Analytics, Chatsworth, CA with the exception of BOD5 analyzed by American Environmental Testing Laboratory, Burbank, CA

EPA = United States Environmental Protection Agency

TPH-DRO = Diesel Range Organics as part of Total Petroleum Hydrocarbon with carbon chain differentiation by EPA Method 8015M

VOCs = Volatile Organic Compounds by EPA Method 8260B

MTBE = Methyl-tert-Butyl Ether

TRPH = Total Recoverable Petroleum Hydrocarbons by EPA Method 418.1

BOD5 20C = Biochemical Oxygen Demand at 20°C by EPA Method 405.1

Nitrate/Nitrite by Ion Chromatography (EPA Method 300)

Metals by EPA Method 6010B

PH by EPA Method 150.1

NA = Not Analyzed

NS = Not Sampled

APPENDIX

A

MONITORING WELL DATA SHEETS

Well Monitoring Data Sheet

ENVIRON

Project #: Cardno 60861040, ENVIRON 0534271A	Client: Freeport-McMoRan Oil & Gas
Sample Tech: Clint Olesen, Jennifer Dishon	Date: 8/21/2014
Well I.D.: **MW-3**	Well Diameter: 2 inch
Total Well Depth (TD): 75.01 ft	Depth to Water (DTW): Dry
Referenced to: PVC	Height of Water Column (feet): NA ft
Depth to Free Product: NA	Thickness of Free Product (feet): NA
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]: NA	

Purge Method: N/A

Sampling Method: N/A

Purge Volume	Well Diameter	Multiplier	Well Diameter	Multiplier
	1"	0.04	4"	0.65
___NA___(Gals.) X ___NA____ = ____NA___ Gals.	**2"**	**0.16**	6"	1.47
1 Case Volume Specified Volumes (x3) Volume to Purge	3"	0.37	Other (__)	radius² * 0.163

Time	Temp (°F)	pH	Cond. (µS)	DO (mg/L)	Turbidity	Gals. Removed	Observations
Well Dry							

Did well Dewater? **NA** Gallons actually evacuated: **NA**

Sample Information	
Sample I.D.: NA	Sample Time: NA
Duplicate: NA	Duplicate ID: NA
Duplicate Time: NA	Laboratory: American Analytics

No. of Containers	Container Type	Volume	Analysis	EPA Method	Time	Preservation

NOTES:

Well Monitoring Data Sheet

ENVIRON

Project #: Cardno 60861040, ENVIRON 0534271A	Client: Freeport-McMoRan Oil & Gas
Sample Tech: Clint Olesen, Jennifer Dishon	Date: 8/21/2014
Well I.D.: **MW-4a**	Well Diameter: 2 inch
Total Well Depth (TD): 120.21 ft	Depth to Water (DTW): 120.00 ft
Referenced to: PVC	Height of Water Column (feet): 0.21 ft
Depth to Free Product: NA	Thickness of Free Product (feet): NA
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]: NA	

Purge Method: N/A

Sampling Method: N/A

Purge Volume	Well Diameter	Multiplier	Well Diameter	Multiplier
	1"	0.04	4"	0.65
____NA____(Gals.) X ___NA_____ = ____NA____ Gals.	**2"**	**0.16**	6"	1.47
1 Case Volume / Specified Volumes (x3) / Volume to Purge	3"	0.37	Other (__)	radius² * 0.163

Time	Temp (°C)	pH	Cond. (µS)	DO (mg/L)	Turbidity (NTUs)	Gals. Removed	Observations
Insufficient Water							

Did well Dewater? NA

Gallons actually evacuated: NA

Sample Information	
Sample I.D.: NA	Sample Time: NA
Duplicate: NA	Duplicate ID: NA
Duplicate Time: NA	Laboratory: NA

No. of Containers	Container Type	Volume	Analysis	EPA Method	Time	Preservation

NOTES:

Well Monitoring Data Sheet

Project #: Cardno 60861040, ENVIRON 0534271A	Client: Freeport-McMoRan Oil & Gas
Sample Tech: Clint Olesen, Jennifer Dishon	Date: 8/21/2014
Well I.D.: **MW-4b**	Well Diameter: 2 inch
Total Well Depth (TD): 166.71 ft	Depth to Water (DTW): Dry
Referenced to: PVC	Height of Water Column (feet): NA
Depth to Free Product: NA	Thickness of Free Product (feet): NA
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]: NA	

Purge Method: N/A

Sampling Method: N/A

Purge Volume	Well Diameter	Multiplier	Well Diameter	Multiplier
	1"	0.04	4"	0.65
____NA____(Gals.) X ___NA_____ = ____NA____ Gals.	**2"**	**0.16**	6"	1.47
1 Case Volume / Specified Volumes (x3) / Volume to Purge	3"	0.37	Other (__)	radius² * 0.163

Time	Temp (°C)	pH	Cond. (µS)	DO (mg/L)	Turbidity (NTUs)	Gals. Removed	Observations
Well Dry							

Did well Dewater? NA

Gallons actually evacuated: NA

Sample Information	
Sample I.D.: NA	Sample Time: NA
Duplicate: NA	Duplicate ID: NA
Duplicate Time: NA	Laboratory: NA

No. of Containers	Container Type	Volume	Analysis	EPA Method	Time	Preservation

NOTES:

Well Monitoring Data Sheet

Project #: Cardno 60861040, ENVIRON 0534271A	Client: Freeport-McMoRan Oil & Gas
Sample Tech: Clint Olesen, Jennifer Dishon	Date: 8/21/2014
Well I.D.: **MW-4c**	Well Diameter: 2 inch
Total Well Depth (TD): 139.95 ft	Depth to Water (DTW): Dry
Referenced to: PVC	Height of Water Column (feet): NA
Depth to Free Product: NA	Thickness of Free Product (feet): NA
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]: NA	

Purge Method: N/A

Sampling Method: N/A

Purge Volume	Well Diameter	Multiplier	Well Diameter	Multiplier
	1"	0.04	4"	0.65
____NA____(Gals.) X ___NA_____ = ____NA____ Gals.	**2"**	**0.16**	6"	1.47
1 Case Volume / Specified Volumes (x3) / Volume to Purge	3"	0.37	Other (__)	radius² * 0.163

Time	Temp (°C)	pH	Cond. (µS)	DO (mg/L)	Turbidity (NTUs)	Gals. Removed	Observations
Well Dry							

Did well Dewater? NA

Gallons actually evacuated: NA

Sample Information	
Sample I.D.: NA	Sample Time: NA
Duplicate: NA	Duplicate ID: NA
Duplicate Time: NA	Laboratory: NA

No. of Containers	Container Type	Volume	Analysis	EPA Method	Time	Preservation

NOTES:

Well Monitoring Data Sheet

ENVIRON

Project #: Cardno 60861040, ENVIRON 0534271A	Client: Freeport-McMoRan Oil & Gas
Sample Tech: Clint Olesen, Jennifer Dishon	Date: 8/21/2014
Well I.D.: **MW-5**	Well Diameter: 2 inch
Total Well Depth (TD): 144.31 ft	Depth to Water (DTW): Dry
Referenced to: PVC	Height of Water Column (feet): NA
Depth to Free Product: NA	Thickness of Free Product (feet): NA
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]: NA	

Purge Method: N/A

Sampling Method: N/A

Purge Volume	Well Diameter	Multiplier	Well Diameter	Multiplier
	1"	0.04	4"	0.65
____NA____(Gals.) X ___NA_____ = ____NA____ Gals.	**2"**	**0.16**	6"	1.47
1 Case Volume / Specified Volumes (x3) / Volume to Purge	3"	0.37	Other (__)	radius² * 0.163

Time	Temp (°C)	pH	Cond. (µS)	DO (mg/L)	Turbidity (NTUs)	Gals. Removed	Observations
Well Dry							

Did well Dewater? NA

Gallons actually evacuated: NA

Sample Information	
Sample I.D.: NA	Sample Time: NA
Duplicate: NA	Duplicate ID: NA
Duplicate Time: NA	Laboratory: NA

No. of Containers	Container Type	Volume	Analysis	EPA Method	Time	Preservation

NOTES:

Well Monitoring Data Sheet

ENVIRON

Project #: Cardno 60861040, ENVIRON 0534271A	Client: Freeport-McMoRan Oil & Gas
Sample Tech: Clint Olesen, Jennifer Dishon	Date: 8/21/2014
Well I.D.: **MW-6**	Well Diameter: 2 inch
Total Well Depth (TD): 73.42 ft	Depth to Water (DTW): 63.59 ft
Referenced to: PVC	Height of Water Column (feet): 9.83 ft
Depth to Free Product: NA	Thickness of Free Product (feet): NA
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]: 65.56 ft	

Purge Method: 2" Grundfos

Sampling Method: Disposable Bailer

Purge Volume	Well Diameter	Multiplier	Well Diameter	Multiplier
___1.57___(Gals.) X ___3___ = ___4.71___ Gals.	1"	0.04	4"	0.65
	2"	**0.16**	6"	1.47
1 Case Volume / Specified Volumes (x3) / Volume to Purge	3"	0.37	Other (__)	radius² * 0.163

Time	Temp (°C)	pH	Cond. (µS)	DO (mg/L)	Turbidity (NTUs)	Gals. Removed	Observations
1136	27.5	7.39	3,751	--	243	1.5	
1138	25.3	7.21	3,761	--	47.7	3	
1139	24.9	7.06	3,756	--	46.7	4.5	
1140	25.1	7.03	3,761	--	30.4	5.5	

Did well Dewater? **No** Gallons actually evacuated: **5.5**

Sample Information

Sample I.D.: MW-6	Sample Time: 12:00
Duplicate: No	Duplicate ID: NA
Duplicate Time: NA	Laboratory: American Analytics

No. of Containers	Container Type	Volume	Analysis	EPA Method	Time	Preservation
3	VOA Vial	40 mL				Ice/HCl
2	Polyethylene Bottle	500 mL				Ice
1	Polyethylene Bottle	500 mL				Ice/HNO_3
1	Amber Bottle	1 L				Ice
1	Amber Bottle	250 mL				Ice/H_2SO_4

NOTES: Samples taken using 0.45 micron filter

Well Monitoring Data Sheet

ENVIRON

Project #: Cardno 60861040, ENVIRON 0534271A	Client: Freeport-McMoRan Oil & Gas
Sample Tech: Clint Olesen, Jennifer Dishon	Date: 8/21/2014
Well I.D.: **MW-7**	Well Diameter: 2 inch
Total Well Depth (TD): 58.42 ft	Depth to Water (DTW): 48.11 ft
Referenced to: PVC	Height of Water Column (feet): 10.31 ft
Depth to Free Product: NA	Thickness of Free Product (feet): NA
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]: 50.17 ft	

Purge Method: 2" Grundfos

Sampling Method: Disposable Bailer

Purge Volume	Well Diameter	Multiplier	Well Diameter	Multiplier
	1"	0.04	4"	0.65
1.64 (Gals.) X 3 = 4.92 Gals.	**2"**	**0.16**	6"	1.47
1 Case Volume / Specified Volumes (x3) / Volume to Purge	3"	0.37	Other (__)	radius² * 0.163

Time	Temp (°C)	pH	Cond. (µS)	DO (mg/L)	Turbidity (NTUs)	Gals. Removed	Observations
1002	28.3	6.42	3,203	--	16.8	1.5	
1005	25.8	6.72	1,811	--	121	3	
1006	24.7	6.63	2,116	--	75.2	4.5	
1008	25.1	6.6	2,468	--	59.4	5.5	

Did well Dewater? **No** Gallons actually evacuated: **6**

Sample Information

Sample I.D.: MW-7	Sample Time: 10:10
Duplicate: No	Duplicate ID: NA
Duplicate Time: NA	Laboratory: American Analytics

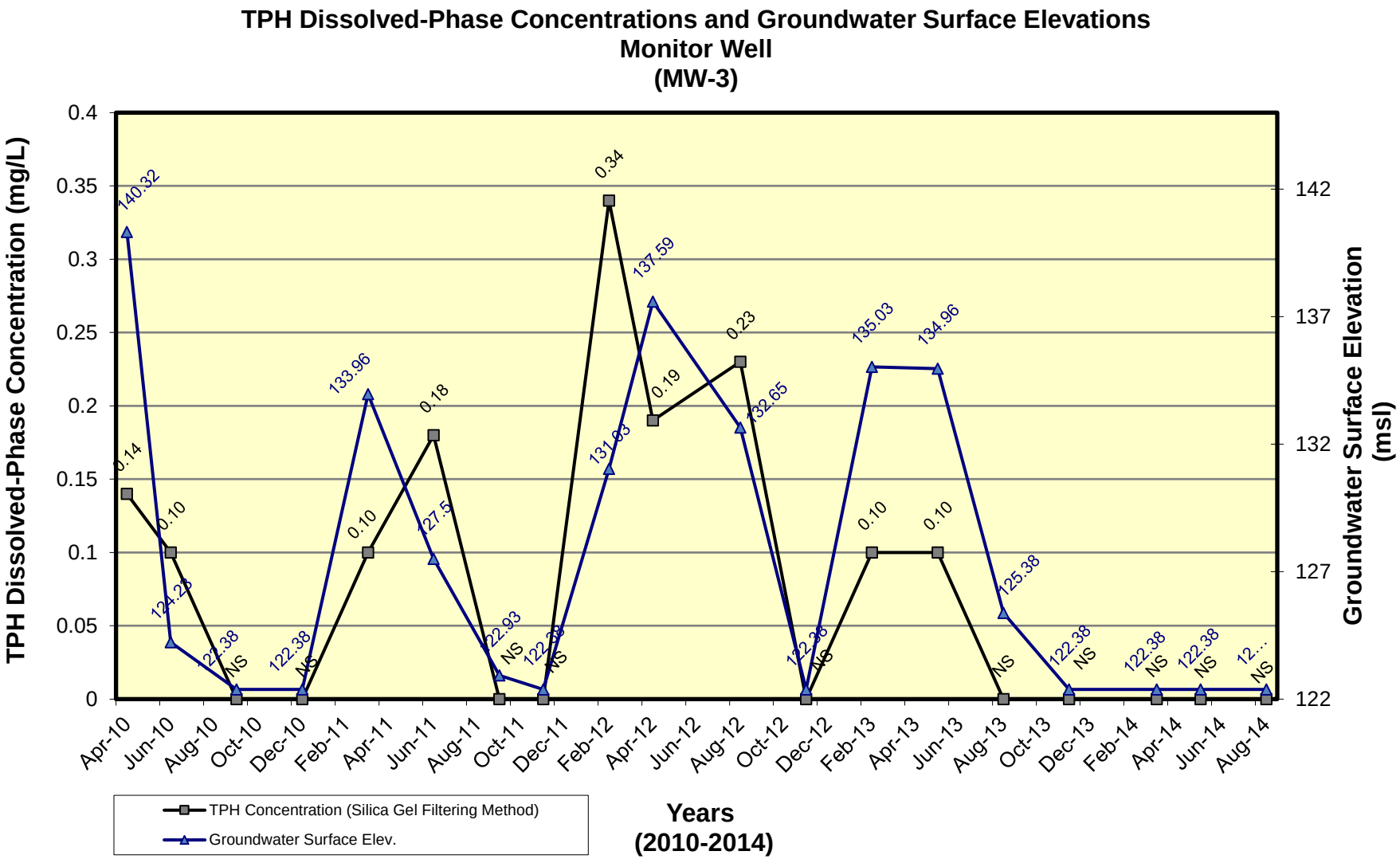
No. of Containers	Container Type	Volume	Analysis	EPA Method	Time	Preservation
3	VOA Vial	40 mL				Ice/HCl
2	Polyethylene Bottle	500 mL				Ice
1	Polyethylene Bottle	500 mL				Ice/HNO_3
1	Amber Bottle	1 L				Ice
1	Amber Bottle	250 mL				Ice/H_2SO_4

NOTES: Samples taken using 0.45 micron filter; purge times estimated based on sampling time.

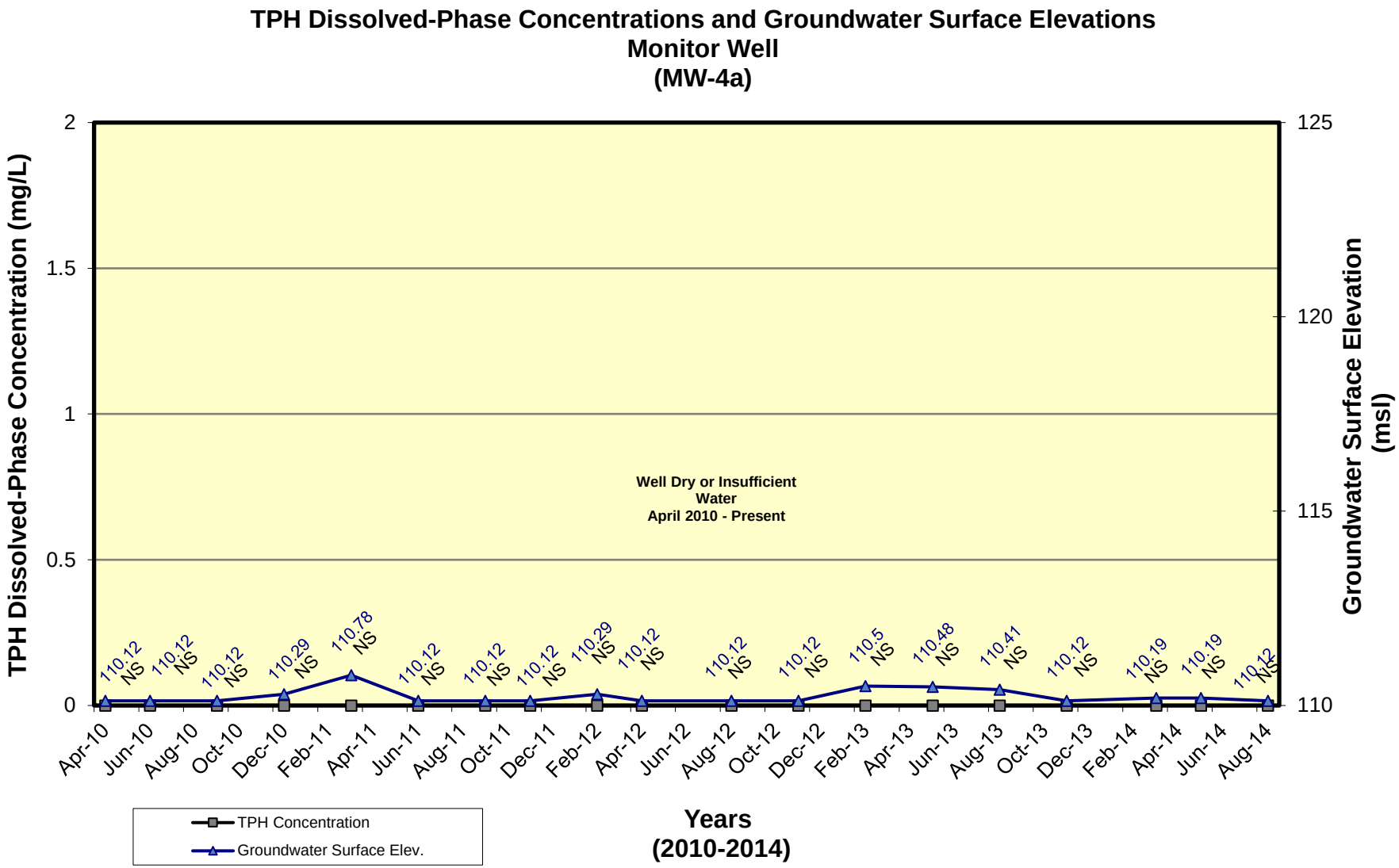
APPENDIX

B

TIME SERIES GRAPHS



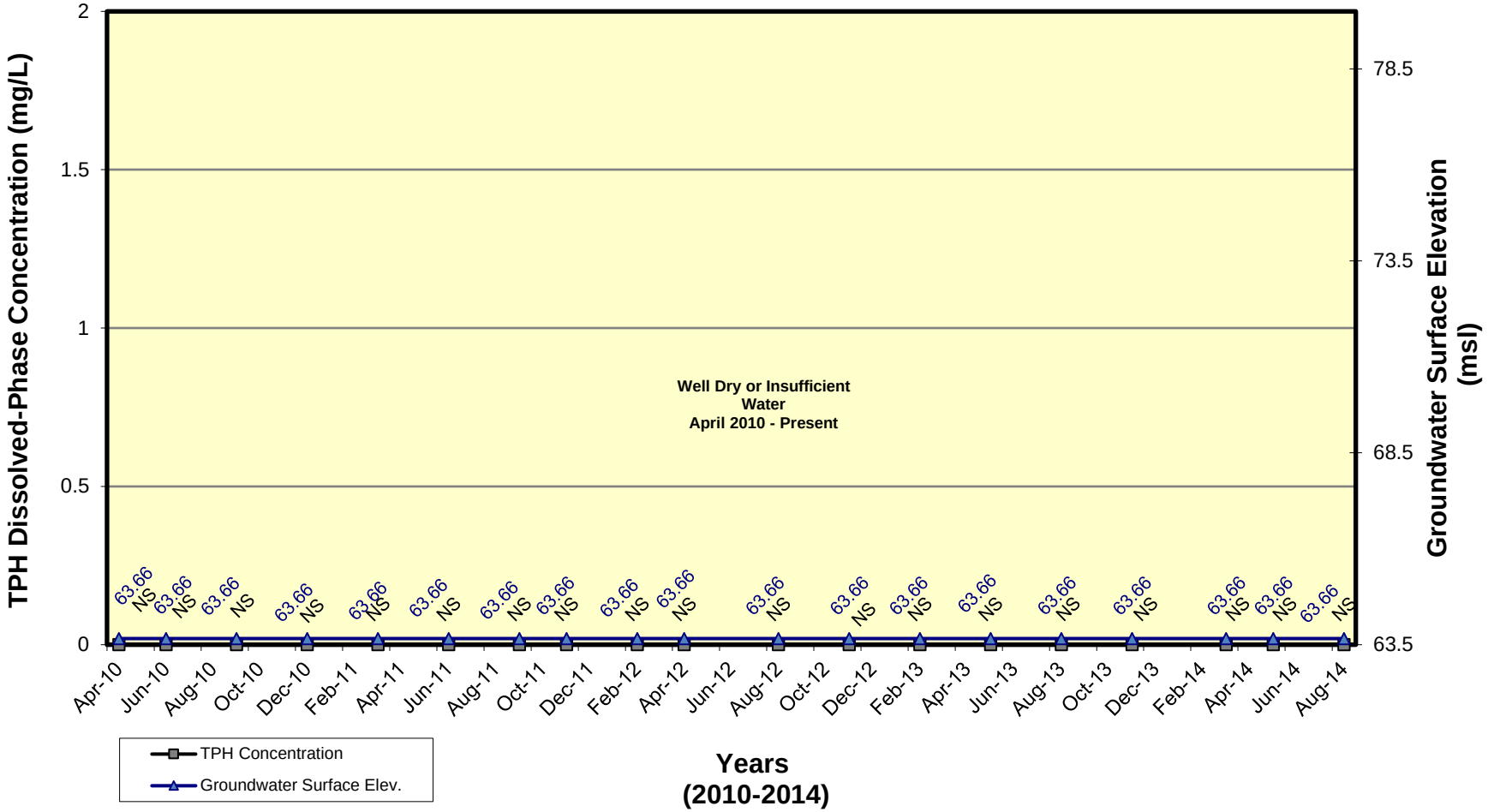
NOTE: TPH Detection Limits (0.1 mg/L April 2010 - Present)
TPH Concentration with Silica Gel Cleanup Presented
Well Bottom = 122.38 ft msl
NS = No Sample Collected, Well Dry or Insufficient Water



NOTE: Well Bottom = 110.12 ft msl

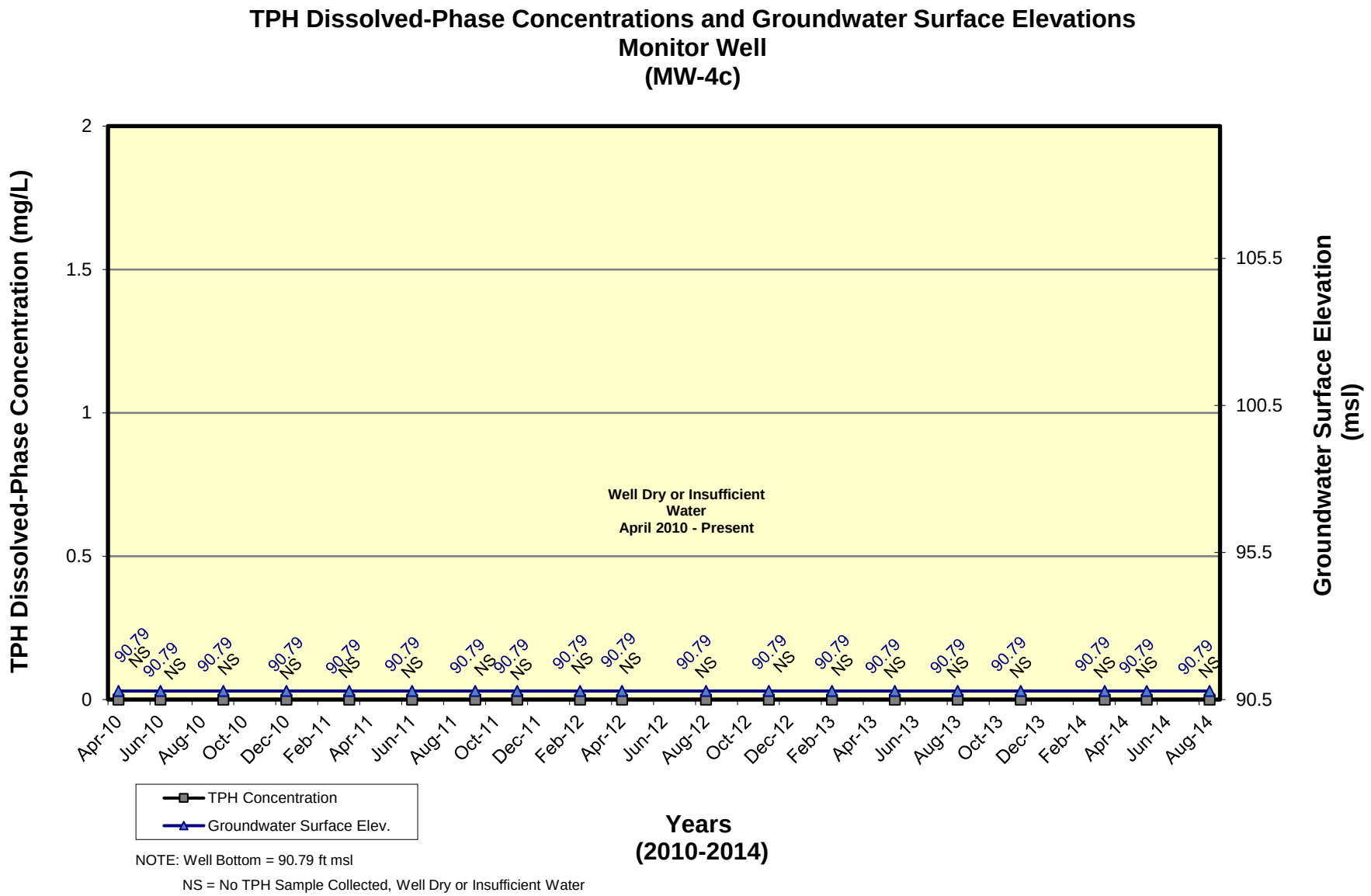
NS = No TPH Sample Collected, Well Dry or Insufficient Water

TPH Dissolved-Phase Concentrations and Groundwater Surface Elevations
Monitor Well
(MW-4b)



NOTE: Well Bottom = 63.66 ft msl

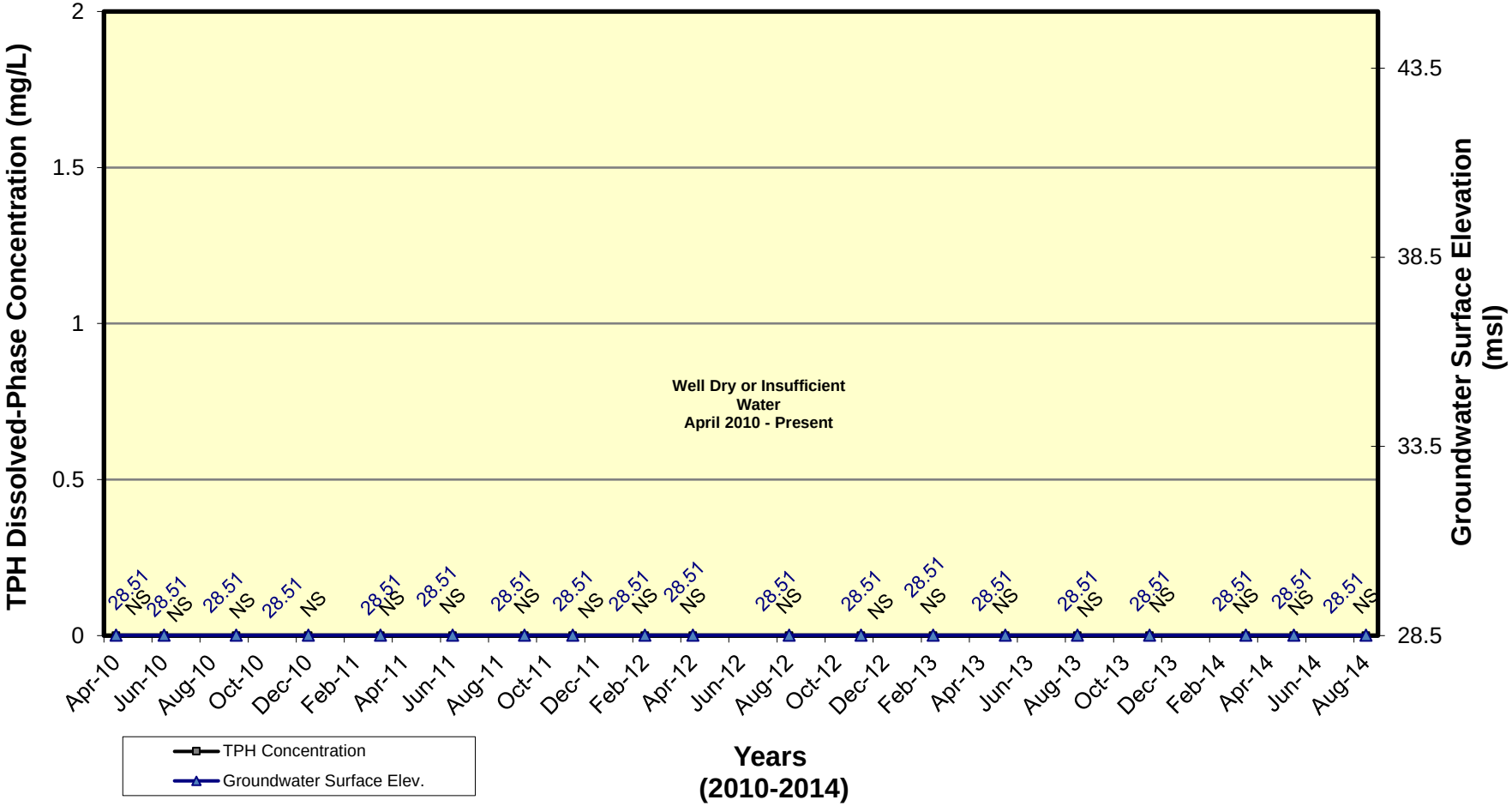
NS = No TPH Sample Collected, Well Dry or Insufficient Water



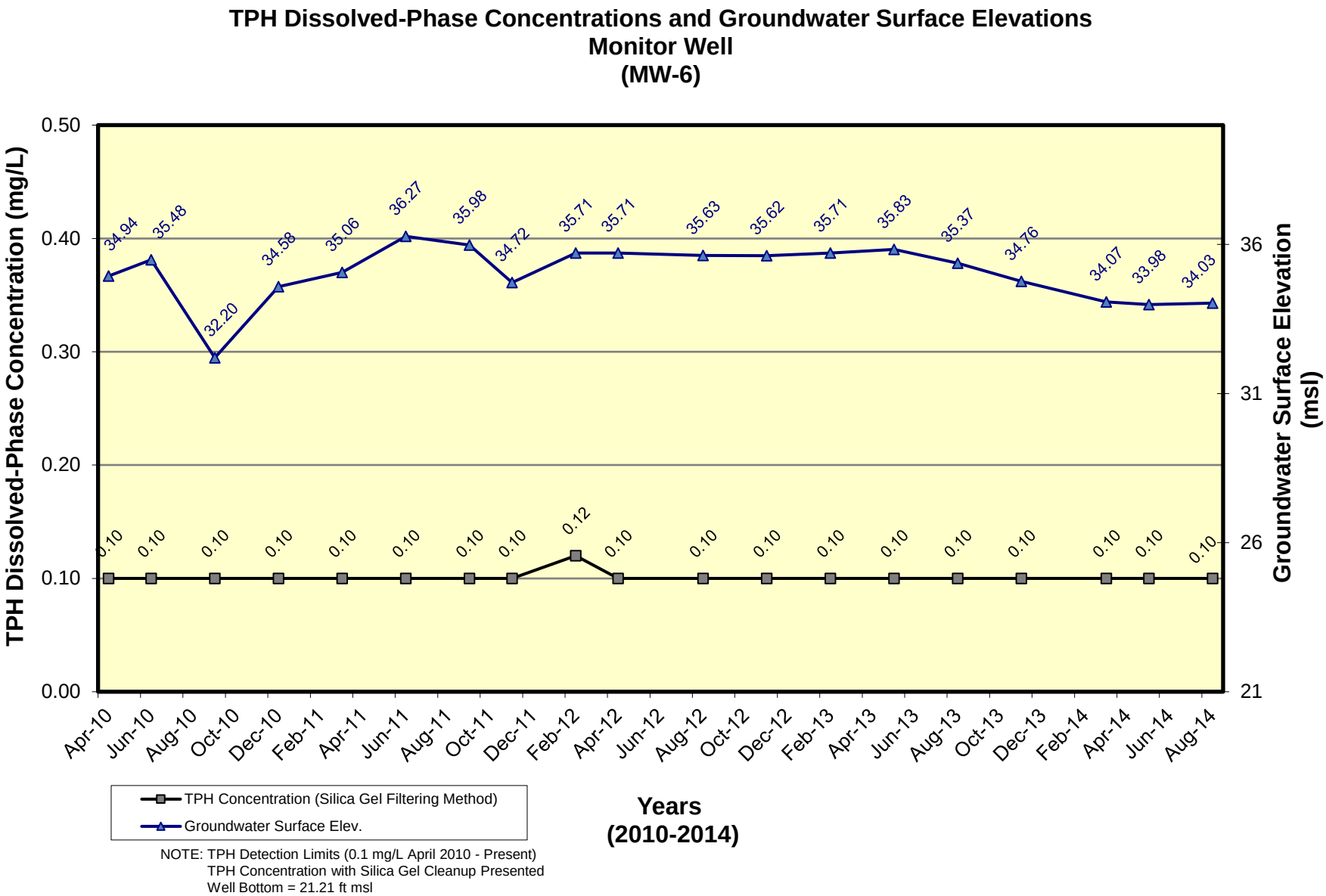
NOTE: Well Bottom = 90.79 ft msl

NS = No TPH Sample Collected, Well Dry or Insufficient Water

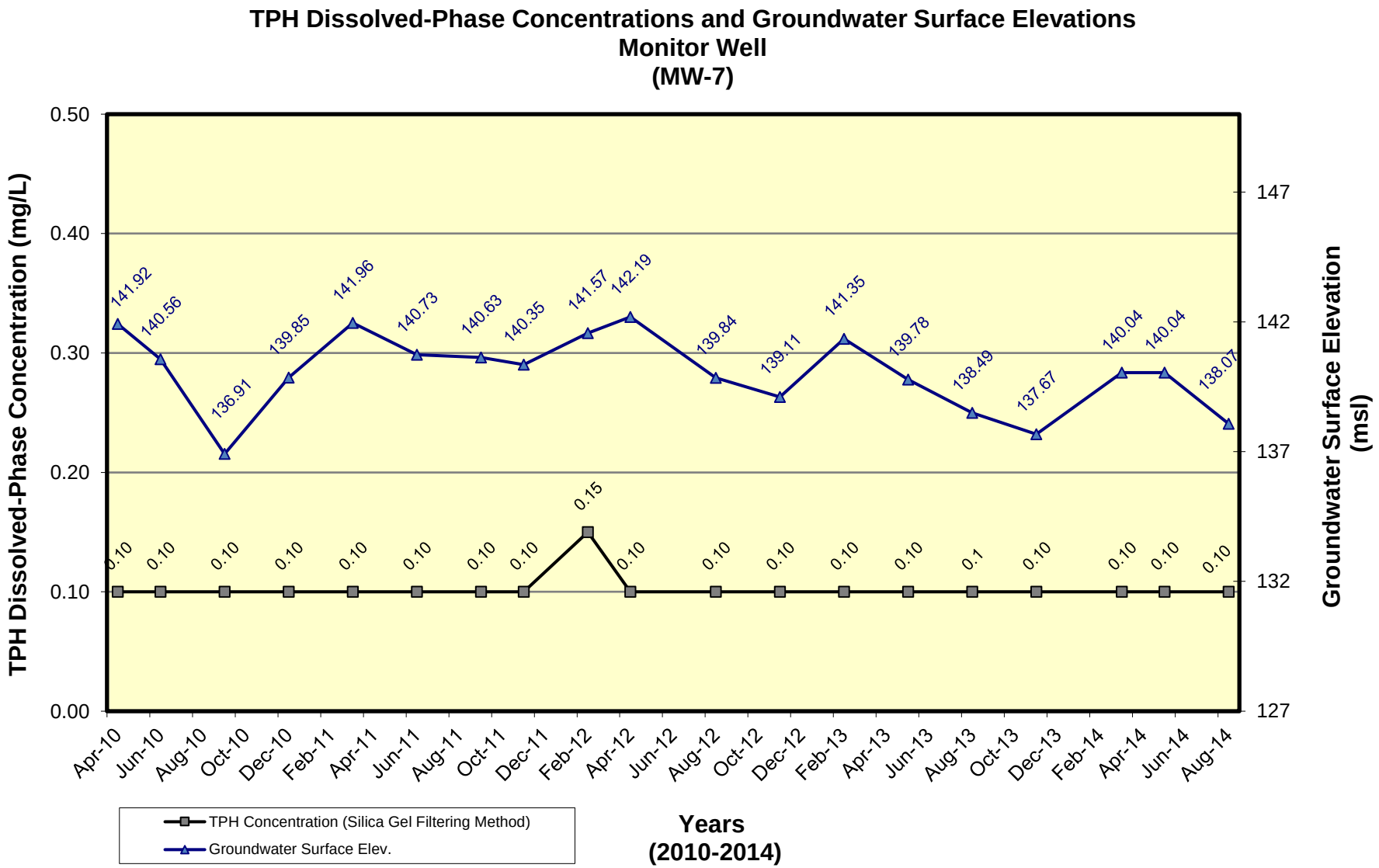
TPH Dissolved-Phase Concentrations and Groundwater Surface Elevations
Monitor Well
(MW-5)



NOTE: Well Bottom = 28.51 ft msl
NS = No TPH Sample Collected, Well Dry or Insufficient Water



NOTE: TPH Detection Limits (0.1 mg/L April 2010 - Present)
TPH Concentration with Silica Gel Cleanup Presented
Well Bottom = 21.21 ft msl



NOTE: TPH Detection Limits (0.1 mg/L April 2010 - Present)
TPH Concentration with Silica Gel Cleanup Presented
Well Bottom = 127.04 ft msl

APPENDIX

C

GROUNDWATER SAMPLING LABORATORY ANALYTICAL DATA AND CHAIN-OF-CUSTODY

9765 Eton Avenue
Chatsworth
California 91311
Tel: (818) 998-5547
Fax: (818) 998-7258

September 04, 2014

Jennifer Dishon

Environ (LA)

707 Wilshire Boulevard, Suite 4950

Los Angeles, CA 90017

Re : FM O&G - Inglewood (GW-CSD)

A641105 / 4H21011

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received on 08/21/14 17:45 and analyzed in accordance with the attached chain-of-custody.

Unless otherwise noted, all analytical testing was accomplished in accordance with the guidelines established in our Quality Assurance Program Manual, applicable standard operating procedures, and other related documentation. The results in this analytical report are limited to the samples tested and any reproduction thereof must be made in its entirety.

If you have any questions regarding this report or require additional information please call me at American Analytics.

Sincerely,

Viorel Vasile

Operations Manager

LABORATORY ANALYSIS RESULTS

Client: Environ (LA)
Project No: NA
Project Name: FM O&G - Inglewood (GW-CSD)

AA Project No: A641105
Date Received: 08/21/14
Date Reported: 09/04/14

Sample ID	Laboratory ID	Matrix	TAT	Date Sampled	Date Received
418.1					
MW-6	4H21011-01	Water	5	08/21/14 12:00	08/21/14 17:45
MW-7	4H21011-02	Water	5	08/21/14 10:10	08/21/14 17:45
8260B BTEXMTBE					
MW-6	4H21011-01	Water	5	08/21/14 12:00	08/21/14 17:45
MW-7	4H21011-02	Water	5	08/21/14 10:10	08/21/14 17:45
Diesel Range Organics 8015M					
MW-6	4H21011-01	Water	5	08/21/14 12:00	08/21/14 17:45
MW-7	4H21011-02	Water	5	08/21/14 10:10	08/21/14 17:45
EPA 8015M DRO (Silica Gel)					
MW-6	4H21011-01	Water	5	08/21/14 12:00	08/21/14 17:45
MW-7	4H21011-02	Water	5	08/21/14 10:10	08/21/14 17:45
Metals Total 6010B					
MW-6	4H21011-01	Water	5	08/21/14 12:00	08/21/14 17:45
MW-7	4H21011-02	Water	5	08/21/14 10:10	08/21/14 17:45
Nitrate as N by Ion Chromatography					
MW-6	4H21011-01	Water	5	08/21/14 12:00	08/21/14 17:45

Viorel Vasile
Operations Manager

LABORATORY ANALYSIS RESULTS

Client: Environ (LA)
Project No: NA
Project Name: FM O&G - Inglewood (GW-CSD)

AA Project No: A641105
Date Received: 08/21/14
Date Reported: 09/04/14

Sample ID	Laboratory ID	Matrix	TAT	Date Sampled	Date Received
MW-7	4H21011-02	Water	5	08/21/14 10:10	08/21/14 17:45
Nitrite as N by Ion Chromatography					
MW-6	4H21011-01	Water	5	08/21/14 12:00	08/21/14 17:45
MW-7	4H21011-02	Water	5	08/21/14 10:10	08/21/14 17:45
pH Measurement 150.1					
MW-6	4H21011-01	Water	5	08/21/14 12:00	08/21/14 17:45
MW-7	4H21011-02	Water	5	08/21/14 10:10	08/21/14 17:45
TDS SM2540C					
MW-6	4H21011-01	Water	5	08/21/14 12:00	08/21/14 17:45
MW-7	4H21011-02	Water	5	08/21/14 10:10	08/21/14 17:45

Viorel Vasile
Operations Manager

LABORATORY ANALYSIS RESULTS

Client: Environ (LA)
Project No: NA
Project Name: FM O&G - Inglewood (GW-CSD)
Method: Nitrite by Ion Chromatography

AA Project No: A641105
Date Received: 08/21/14
Date Reported: 09/04/14

AA I.D. No.	Client I.D. No.	Sampled	Prepared	Analyzed	Dilution	Result	Units	MRL
Nitrite as N by Ion Chromatography (EPA 300.0)								
4H21011-01	MW-6	08/21/14	08/22/14	08/22/14	10	<3.0	mg/L	0.3
4H21011-02	MW-7	08/21/14	08/22/14	08/22/14	10	<3.0	mg/L	0.3

Viorel Vasile
Operations Manager

LABORATORY ANALYSIS RESULTS

Client: Environ (LA)
Project No: NA
Project Name: FM O&G - Inglewood (GW-CSD)
Method: Nitrate by Ion Chromatography

AA Project No: A641105
Date Received: 08/21/14
Date Reported: 09/04/14

AA I.D. No.	Client I.D. No.	Sampled	Prepared	Analyzed	Dilution	Result	Units	MRL
Nitrate as N by Ion Chromatography (EPA 300.0)								
4H21011-01	MW-6	08/21/14	08/22/14	08/22/14	1	**1.3**	mg/L	0.1
4H21011-02	MW-7	08/21/14	08/22/14	08/22/14	1	**5.0**	mg/L	0.1

Viorel Vasile
Operations Manager

LABORATORY ANALYSIS RESULTS

Client: Environ (LA)
Project No: NA
Project Name: FM O&G - Inglewood (GW-CSD)
Method: General Chemistry Analyses

AA Project No: A641105
Date Received: 08/21/14
Date Reported: 09/04/14

AA I.D. No.	Client I.D. No.	Sampled	Prepared	Analyzed	Dilution	Result	Units	MRL
418.1 (EPA 418.1)								
4H21011-01	MW-6	08/21/14	08/27/14	08/27/14	1	<5.0	mg/L	5
4H21011-02	MW-7	08/21/14	08/27/14	08/27/14	1	<5.0	mg/L	5
pH Measurement 150.1 (EPA 150.1)								
4H21011-01	MW-6	08/21/14	08/21/14	08/21/14	1	**6.8**	pH Units	0.01
4H21011-02	MW-7	08/21/14	08/21/14	08/21/14	1	**6.7**	pH Units	0.01
TDS SM2540C (SM2540C)								
4H21011-01	MW-6	08/21/14	08/21/14	08/25/14	10	**2300**	mg/L	10
4H21011-02	MW-7	08/21/14	08/21/14	08/25/14	10	**2400**	mg/L	10

Viorel Vasile
Operations Manager

LABORATORY ANALYSIS RESULTS

Client: Environ (LA)
Project No: NA
Project Name: FM O&G - Inglewood (GW-CSD)
Method: BTEX/MTBE by GC/MS

AA Project No: A641105
Date Received: 08/21/14
Date Reported: 09/04/14
Units: ug/L

Date Sampled:	08/21/14	08/21/14	
Date Prepared:	08/28/14	08/28/14	
Date Analyzed:	08/29/14	08/29/14	
AA ID No:	4H21011-01	4H21011-02	
Client ID No:	MW-6	MW-7	
Matrix:	Water	Water	
Dilution Factor:	1	1	MRL
8260B BTEXMTBE (EPA 8260B)			
Benzene	<0.50	<0.50	0.50
Ethylbenzene	<0.50	<0.50	0.50
Methyl-tert-Butyl Ether (MTBE)	<2.0	<2.0	2.0
Toluene	<0.50	<0.50	0.50
o-Xylene	<0.50	<0.50	0.50
m,p-Xylenes	<1.0	<1.0	1.0
Surrogates			**%REC Limits**
Dibromofluoromethane	98%	111%	70-140
Toluene-d8	103%	101%	70-140

Viorel Vasile
Operations Manager

LABORATORY ANALYSIS RESULTS

Client: Environ (LA)
Project No: NA
Project Name: FM O&G - Inglewood (GW-CSD)
Method: Diesel Range Organics by GC/FID

AA Project No: A641105
Date Received: 08/21/14
Date Reported: 09/04/14
Units: mg/L

Date Sampled:	08/21/14	08/21/14	
Date Prepared:	08/26/14	08/26/14	
Date Analyzed:	08/26/14	08/26/14	
AA ID No:	4H21011-01	4H21011-02	
Client ID No:	MW-6	MW-7	
Matrix:	Water	Water	
Dilution Factor:	1	1	MRL
Diesel Range Organics 8015M (EPA 8015M)			
Diesel Range Organics as Diesel	**0.70**	**0.46**	0.10
Surrogates			**%REC Limits**
o-Terphenyl	148%	134%	50-150

Viorel Vasile
Operations Manager

LABORATORY ANALYSIS RESULTS

Client: Environ (LA)
Project No: NA
Project Name: FM O&G - Inglewood (GW-CSD)
Method: Diesel Range Organics by GC/FID (Silica Gel Cleanup)

AA Project No: A641105
Date Received: 08/21/14
Date Reported: 09/04/14
Units: mg/L

Date Sampled:	08/21/14	08/21/14	
Date Prepared:	08/27/14	08/27/14	
Date Analyzed:	08/27/14	08/27/14	
AA ID No:	4H21011-01	4H21011-02	
Client ID No:	MW-6	MW-7	
Matrix:	Water	Water	
Dilution Factor:	1	1	MRL
EPA 8015M DRO (Silica Gel) (EPA 8015M)			
Diesel Range Organics as Diesel	<0.10	<0.10	0.10
Surrogates			**%REC Limits**
o-Terphenyl	125%	147%	50-150

Viorel Vasile
Operations Manager

LABORATORY ANALYSIS RESULTS

Client: Environ (LA)
Project No: NA
Project Name: FM O&G - Inglewood (GW-CSD)
Method: Total Metals by EPA 6010B

AA Project No: A641105
Date Received: 08/21/14
Date Reported: 09/04/14
Units: ug/L

Date Sampled:	08/21/14	08/21/14	
Date Prepared:	08/25/14	08/25/14	
Date Analyzed:	08/28/14	08/28/14	
AA ID No:	4H21011-01	4H21011-02	
Client ID No:	MW-6	MW-7	
Matrix:	Water	Water	
Dilution Factor:	1	1	MRL
Metals Total 6010B (EPA 6010B)			
Arsenic	<7.0	<7.0	7.0
Barium	<100	<100	100
Chromium	<10	<10	10
Cobalt	<50	<50	50
Copper	<25	<25	25
Lead	<10	<10	10
Zinc	<50	<50	50

Viorel Vasile
Operations Manager

LABORATORY ANALYSIS RESULTS

Client: Environ (LA)
Project No: NA
Project Name: FM O&G - Inglewood (GW-CSD)

AA Project No: A641105
Date Received: 08/21/14
Date Reported: 09/04/14

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Nitrite by Ion Chromatography - Quality Control										
Batch B4H2207 - NO PREP										
Blank (B4H2207-BLK1)				Prepared & Analyzed: 08/22/14						
Nitrite as N	<0.30	0.30	mg/L							
LCS (B4H2207-BS1)				Prepared & Analyzed: 08/22/14						
Nitrite as N	**4.84**	0.30	mg/L	5.0		96.9	90-110			
LCS (B4H2207-BS2)				Prepared & Analyzed: 08/25/14						
Nitrite as N	**4.58**	0.30	mg/L	5.0		91.6	90-110			
LCS Dup (B4H2207-BSD1)				Prepared & Analyzed: 08/22/14						
Nitrite as N	**4.51**	0.30	mg/L	5.0		90.1	90-110	7.25	30	
LCS Dup (B4H2207-BSD2)				Prepared & Analyzed: 08/25/14						
Nitrite as N	**4.84**	0.30	mg/L	5.0		96.7	90-110	5.42	30	
Matrix Spike (B4H2207-MS1)		**Source: 4H21011-01**		Prepared & Analyzed: 08/25/14						
Nitrite as N	**9.83**	3.0	mg/L	10	<3.0	98.3	80-120			
Matrix Spike Dup (B4H2207-MSD1)		**Source: 4H21011-01**		Prepared & Analyzed: 08/25/14						
Nitrite as N	**9.54**	3.0	mg/L	10	<3.0	95.4	80-120	2.99	40	
Nitrate by Ion Chromatography - Quality Control										
Batch B4H2207 - NO PREP										
Blank (B4H2207-BLK1)				Prepared & Analyzed: 08/22/14						
Nitrate as N	<0.10	0.10	mg/L							
LCS (B4H2207-BS1)				Prepared & Analyzed: 08/22/14						
Nitrate as N	**4.68**	0.10	mg/L	5.0		93.7	90-110			
LCS (B4H2207-BS2)				Prepared & Analyzed: 08/25/14						
Nitrate as N	**4.66**	0.10	mg/L	5.0		93.3	90-110			
LCS Dup (B4H2207-BSD1)				Prepared & Analyzed: 08/22/14						
Nitrate as N	**4.67**	0.10	mg/L	5.0		93.3	90-110	0.385	20	
LCS Dup (B4H2207-BSD2)				Prepared & Analyzed: 08/25/14						
Nitrate as N	**4.87**	0.10	mg/L	5.0		97.5	90-110	4.36	20	
Matrix Spike (B4H2207-MS1)		**Source: 4H21011-01**		Prepared & Analyzed: 08/25/14						
Nitrate as N	**11.4**	1.0	mg/L	10	1.27	101	80-120			
Matrix Spike Dup (B4H2207-MSD1)		**Source: 4H21011-01**		Prepared & Analyzed: 08/25/14						
Nitrate as N	**11.0**	1.0	mg/L	10	1.27	97.3	80-120	3.48	30	

Viorel Vasile
Operations Manager

LABORATORY ANALYSIS RESULTS

Client: Environ (LA)
Project No: NA
Project Name: FM O&G - Inglewood (GW-CSD)

AA Project No: A641105
Date Received: 08/21/14
Date Reported: 09/04/14

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
General Chemistry Analyses - Quality Control										
Batch B4H2208 - NO PREP										
Duplicate (B4H2208-DUP1)			**Source: 4H21011-01**	Prepared & Analyzed: 08/21/14						
pH	**6.73**	0.010	pH Units		6.75			0.297	20	
Batch B4H2609 - NO PREP										
Blank (B4H2609-BLK1)				Prepared: 08/21/14			Analyzed: 08/25/14			
Total Dissolved Solids	<10	10	mg/L							
LCS (B4H2609-BS1)				Prepared: 08/21/14			Analyzed: 08/25/14			
Total Dissolved Solids	**43.0**	10	mg/L	50		86.0	80-120			
LCS Dup (B4H2609-BSD1)				Prepared: 08/21/14			Analyzed: 08/25/14			
Total Dissolved Solids	**55.0**	10	mg/L	50		110	80-120	24.5	25	
Duplicate (B4H2609-DUP1)			**Source: 4H19012-05**	Prepared: 08/21/14			Analyzed: 08/25/14			
Total Dissolved Solids	**990**	100	mg/L		1010			2.00	20	
Batch B4H2712 - NO PREP										
Blank (B4H2712-BLK1)				Prepared & Analyzed: 08/27/14						
Total Petroleum Hydrocarbons	<5.0	5.0	mg/L							
LCS (B4H2712-BS1)				Prepared & Analyzed: 08/27/14						
Total Petroleum Hydrocarbons	**4.0**	5.0	mg/L	4.0		101	70-130		30	
LCS Dup (B4H2712-BSD1)				Prepared & Analyzed: 08/27/14						
Total Petroleum Hydrocarbons	**4.2**	5.0	mg/L	4.0		104	70-130	3.41	30	
BTEX/MTBE by GC/MS - Quality Control										
Batch B4H2803 - EPA 5030B										
Blank (B4H2803-BLK1)				Prepared: 08/28/14			Analyzed: 08/29/14			
Benzene	<0.50	0.50	ug/L							
Ethylbenzene	<0.50	0.50	ug/L							
Methyl-tert-Butyl Ether (MTBE)	<2.0	2.0	ug/L							
Toluene	<0.50	0.50	ug/L							
o-Xylene	<0.50	0.50	ug/L							
m,p-Xylenes	<1.0	1.0	ug/L							
Surrogate: Dibromofluoromethane	*53.1*		*ug/L*	*50*		*106*	*70-140*			
Surrogate: Toluene-d8	*49.0*		*ug/L*	*50*		*98.1*	*70-140*			
LCS (B4H2803-BS1)				Prepared: 08/28/14			Analyzed: 08/29/14			

Viorel Vasile
Operations Manager

LABORATORY ANALYSIS RESULTS

Client: Environ (LA)
Project No: NA
Project Name: FM O&G - Inglewood (GW-CSD)

AA Project No: A641105
Date Received: 08/21/14
Date Reported: 09/04/14

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
BTEX/MTBE by GC/MS - Quality Control										
Batch B4H2803 - EPA 5030B										
LCS (B4H2803-BS1) Continued				Prepared: 08/28/14		Analyzed: 08/29/14				
Benzene	**20.7**	0.50	ug/L	20		103	75-125			
Ethylbenzene	**21.4**	0.50	ug/L	20		107	75-125			
Methyl-tert-Butyl Ether (MTBE)	**24.6**	2.0	ug/L	20		123	70-135			
Toluene	**20.2**	0.50	ug/L	20		101	75-125			
o-Xylene	**22.3**	0.50	ug/L	20		111	75-125			
Surrogate: Dibromofluoromethane	*52.2*		*ug/L*	*50*		*104*	*70-140*			
Surrogate: Toluene-d8	*47.9*		*ug/L*	*50*		*95.8*	*70-140*			
LCS Dup (B4H2803-BSD1)				Prepared: 08/28/14		Analyzed: 08/29/14				
Benzene	**22.8**	0.50	ug/L	20		114	75-125	10.1	30	
Ethylbenzene	**22.2**	0.50	ug/L	20		111	75-125	3.62	30	
Methyl-tert-Butyl Ether (MTBE)	**21.9**	2.0	ug/L	20		109	70-135	11.7	30	
Toluene	**21.2**	0.50	ug/L	20		106	75-125	4.74	30	
o-Xylene	**22.6**	0.50	ug/L	20		113	75-125	1.47	30	
Surrogate: Dibromofluoromethane	*53.6*		*ug/L*	*50*		*107*	*70-140*			
Surrogate: Toluene-d8	*47.8*		*ug/L*	*50*		*95.5*	*70-140*			
Matrix Spike (B4H2803-MS1)		**Source: 4H21011-01**		Prepared: 08/28/14		Analyzed: 08/29/14				
Benzene	**21.8**	0.50	ug/L	20	<0.50	109	70-130			
Ethylbenzene	**21.8**	0.50	ug/L	20	<0.50	109	70-130			
Methyl-tert-Butyl Ether (MTBE)	**21.9**	2.0	ug/L	20	<2.0	110	70-130			
Toluene	**19.9**	0.50	ug/L	20	<0.50	99.4	70-130			
o-Xylene	**22.0**	0.50	ug/L	20	<0.50	110	70-130			
Surrogate: Dibromofluoromethane	*52.3*		*ug/L*	*50*		*105*	*70-140*			
Surrogate: Toluene-d8	*48.0*		*ug/L*	*50*		*96.0*	*70-140*			
Matrix Spike Dup (B4H2803-MSD1)		**Source: 4H21011-01**		Prepared: 08/28/14		Analyzed: 08/29/14				
Benzene	**21.2**	0.50	ug/L	20	<0.50	106	70-130	2.65	30	
Ethylbenzene	**20.9**	0.50	ug/L	20	<0.50	104	70-130	4.41	30	
Methyl-tert-Butyl Ether (MTBE)	**20.8**	2.0	ug/L	20	<2.0	104	70-130	5.05	30	
Toluene	**19.7**	0.50	ug/L	20	<0.50	98.6	70-130	0.808	30	
o-Xylene	**21.4**	0.50	ug/L	20	<0.50	107	70-130	2.85	30	
Surrogate: Dibromofluoromethane	*54.1*		*ug/L*	*50*		*108*	*70-140*			

Viorel Vasile
Operations Manager

LABORATORY ANALYSIS RESULTS

Client: Environ (LA)
Project No: NA
Project Name: FM O&G - Inglewood (GW-CSD)

AA Project No: A641105
Date Received: 08/21/14
Date Reported: 09/04/14

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
BTEX/MTBE by GC/MS - Quality Control										
Batch B4H2803 - EPA 5030B										
Matrix Spike Dup (B4H2803-MSD1) Continued			**Source: 4H21011-01**	Prepared: 08/28/14		Analyzed: 08/29/14				
Surrogate: Toluene-d8	*48.4*		*ug/L*	*50*		*96.9*	*70-140*			
Diesel Range Organics by GC/FID - Quality Control										
Batch B4H2601 - EPA 3510C										
Blank (B4H2601-BLK1)				Prepared & Analyzed: 08/26/14						
Diesel Range Organics as Diesel	<0.10	0.10	mg/L							
Surrogate: o-Terphenyl	*0.0729*		*mg/L*	*0.050*		*146*	*50-150*			
LCS (B4H2601-BS1)				Prepared & Analyzed: 08/26/14						
Diesel Range Organics as Diesel	**1.22**	0.10	mg/L	1.0		122	75-125			
Surrogate: o-Terphenyl	*0.0680*		*mg/L*	*0.050*		*136*	*50-150*			
LCS Dup (B4H2601-BSD1)				Prepared & Analyzed: 08/26/14						
Diesel Range Organics as Diesel	**1.27**	0.10	mg/L	1.0		127	75-125	3.91	30	
Surrogate: o-Terphenyl	*0.0657*		*mg/L*	*0.050*		*131*	*50-150*			
Diesel Range Organics by GC/FID (Silica Gel Cleanup) - Quality Control										
Batch B4H2718 - EPA 3510C										
Blank (B4H2718-BLK1)				Prepared & Analyzed: 08/27/14						
Diesel Range Organics as Diesel	<0.10	0.10	mg/L							
Surrogate: o-Terphenyl	*0.0721*		*mg/L*	*0.050*		*144*	*50-150*			
LCS (B4H2718-BS1)				Prepared & Analyzed: 08/27/14						
Diesel Range Organics as Diesel	**1.03**	0.10	mg/L	1.0		103	75-125			
Surrogate: o-Terphenyl	*0.0694*		*mg/L*	*0.050*		*139*	*50-150*			
LCS Dup (B4H2718-BSD1)				Prepared & Analyzed: 08/27/14						
Diesel Range Organics as Diesel	**1.01**	0.10	mg/L	1.0		101	75-125	1.51	30	
Surrogate: o-Terphenyl	*0.0662*		*mg/L*	*0.050*		*132*	*50-150*			
Total Metals by EPA 6010B - Quality Control										
Batch B4H2510 - EPA 3010A										
Blank (B4H2510-BLK1)				Prepared: 08/25/14		Analyzed: 08/28/14				

Viorel Vasile
Operations Manager

LABORATORY ANALYSIS RESULTS

Client: Environ (LA)
Project No: NA
Project Name: FM O&G - Inglewood (GW-CSD)

AA Project No: A641105
Date Received: 08/21/14
Date Reported: 09/04/14

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Total Metals by EPA 6010B - Quality Control										
Batch B4H2510 - EPA 3010A										
Blank (B4H2510-BLK1) Continued				Prepared: 08/25/14 Analyzed: 08/28/14						
Arsenic	<7.0	7.0	ug/L							
Barium	<100	100	ug/L							
Chromium	<10	10	ug/L							
Cobalt	<50	50	ug/L							
Copper	<25	25	ug/L							
Lead	<10	10	ug/L							
Zinc	<50	50	ug/L							
LCS (B4H2510-BS1)				Prepared: 08/25/14 Analyzed: 08/28/14						
Arsenic	**202**	7.0	ug/L	200		101	80-120		20	
Barium	**201**	100	ug/L	200		100	80-120		20	
Chromium	**200**	10	ug/L	200		100	80-120		20	
Cobalt	**205**	50	ug/L	200		102	80-120		20	
Copper	**203**	25	ug/L	200		101	80-120		20	
Lead	**198**	10	ug/L	200		98.8	80-120		20	
Zinc	**223**	50	ug/L	200		112	80-120		20	
LCS Dup (B4H2510-BSD1)				Prepared: 08/25/14 Analyzed: 08/28/14						
Arsenic	**257**	7.0	ug/L	200		128	80-120	24.1	20	
Barium	**248**	100	ug/L	200		124	80-120	21.3	20	
Chromium	**249**	10	ug/L	200		124	80-120	21.6	20	
Cobalt	**253**	50	ug/L	200		126	80-120	20.9	20	
Copper	**251**	25	ug/L	200		126	80-120	21.3	20	
Lead	**245**	10	ug/L	200		122	80-120	21.3	20	
Zinc	**258**	50	ug/L	200		129	80-120	14.7	20	

Viorel Vasile
Operations Manager

LABORATORY ANALYSIS RESULTS

Client: Environ (LA)
Project No: NA
Project Name: FM O&G - Inglewood (GW-CSD)

AA Project No: A641105
Date Received: 08/21/14
Date Reported: 09/04/14

Special Notes

Viorel Vasile
Operations Manager

American Environmental Testing Laboratory Inc.

2834 & 2908 North Naomi Street Burbank, CA 91504 • DOHS NO: 1541, LACSD NO: 10181
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Ordered By

American Analytics
9765 Eton Avenue
Chatsworth, CA 91311-4306

Number of Pages 2
Date Received 08/22/2014
Date Reported 09/03/2014

Telephone: (818)998-5547
Attention: Viorel Vasile

Job Number	Order Date	Client
74146	08/22/2014	AA

Project ID: A641105/4H21011
Project Name: PO# SUB02764-A641105

Enclosed please find results of analyses of 2 water samples which were analyzed as specified on the attached chain of custody. If there are any questions, please do not hesitate to call.

Checked By: _____ Approved By: C. Razmara

Cyrus Razmara, Ph.D.
Laboratory Director

AETL

AMERICAN ANALYTICS CHAIN-OF-CUSTODY RECORD

74146

9765 ETON AVE., CHATSWORTH, CA 91311
Tel: 818-998-5547 FAX: 818-998-7258

A.A. COC No.: 70040623
Page 1 of 1

Client: AMERICAN ANALYTICS | Project Name / No.: A641105/4H21011 | Sampler's Name:
Project Manager: Viorel Vasile | Site Address: | Sampler's Signature:
Phone: | City: | P.O. No.: SV802764-A641105
Fax: | State & Zip: | Quote No.:

TAT Turnaround Codes **
1 = Same Day Rush
2 = 24 Hour Rush
3 = 48 Hour Rush
4 = 72 Hour Rush
5 = 5 Day Rush
X = 10 Working Days (Standard TAT)

ANALYSIS REQUESTED (Test Name)

Client I.D.	A.A. I.D.	Date	Time	Sample Matrix	No. of Cont	624										Special Instructions
						Please enter the TAT Turnaround Codes ** below										
4H21011-01	74146.01	8/21/14	1200	Water	1	X										by SM5210B
-02	74146.02	-"-	1010	-"-	1	X										
																Normal TAT
																Thank you

For Laboratory Use

A.A. Project No.:

Relinquished by	Date	Time	Received by
[signature]	8-22-14	810	[signature]
[signature]	08/22/14	0907	Jean Claude

Note: By relinquishing samples to American Analytics, client agrees to pay for the services requested on this chain of custody form and any additional client-requested analyses performed on this project. Payment for services is due within 30 days from the date of invoice. Sample(s) will be disposed of after 45 days following the submittal of the sample(s) to American Analytics.

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Ordered By

American Analytics
9765 Eton Avenue
Chatsworth, CA 91311-4306

Telephone: (818)998-5547
Attention: Viorel Vasile

Project ID: A641105/4H21011
Date Received 08/22/2014
Date Reported 09/03/2014

Job Number	Order Date	Client
74146	08/22/2014	AA

CERTIFICATE OF ANALYSIS
CASE NARRATIVE

AETL received 2 samples with the following specification on 08/22/2014.

Lab ID	Sample ID	Sample Date	Matrix	Quantity Of Containers
74146.01	4H21011-01	08/21/2014	Aqueous	1
74146.02	4H21011-02	08/21/2014	Aqueous	1

Method ^ Submethod	Req Date	Priority	TAT	Units
SM5210B	08/29/2014	2	Normal	mg/L

The samples were analyzed as specified on the enclosed chain of custody.
No analytical non-conformances were encountered.

Checked By: _____ Approved By: C. Razmara

Cyrus Razmara, Ph.D.
Laboratory Director

American Environmental Testing Laboratory Inc.

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ANALYTICAL RESULTS

Ordered By

American Analytics
9765 Eton Avenue
Chatsworth, CA 91311-4306

Telephone: (818)998-5547
Attn: Viorel Vasile
Page: **2**

Project ID: **A641105/4H21011**
Project Name: **PO# SUB02764-A641105**

AETL Job Number	Submitted	Client
74146	08/22/2014	AA

Method: SM5210B, Biochemical Oxygen Demand 5 days, @ 20C (Standard Methods)

QC Batch No: 082214-1

Our Lab I.D.			Method Blank	**74146.01**	**74146.02**		
Client Sample I.D.				4H21011-01	4H21011-02		
Date Sampled				**08/21/2014**	**08/21/2014**		
Date Prepared			**08/22/2014**	**08/22/2014**	**08/22/2014**		
Preparation Method			**SM5210B**	**SM5210B**	**SM5210B**		
Date Analyzed			**08/27/2014**	**08/27/2014**	**08/27/2014**		
Matrix			Aqueous	Aqueous	Aqueous		
Units			mg/L	mg/L	mg/L		
Dilution Factor			1	1	1		
Analytes	**MDL**	**PQL**	**Results**	**Results**	**Results**		
Biochemical Oxygen Demand (BOD)	**5.0**	**5.0**	**ND**	**44.7**	**33.3**		

QUALITY CONTROL REPORT

QC Batch No: 082214-1; Dup or Spiked Sample: 74146.02; LCS: Clean Water; LCS Prepared: 08/22/2014; LCS Analyzed: 08/27/2014; Units: mg/L

Analytes	SM Result	SM DUP Result	RPD %	SM RPD % Limit	LCS Concen	LCS Recov	LCS % REC	LCS/LCSD % Limit		
Biochemical Oxygen Demand (BOD)	**33.3**	**33.3**	**<1**	**<15**	**198**	**214**	**108**	**80-120**		

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Data Qualifiers and Descriptors

Data Qualifier:

#:	Recovery is not within acceptable control limits.
*:	In the QC section, sample results have been taken directly from the ICP reading. No preparation factor has been applied.
B:	Analyte was present in the Method Blank.
D:	Result is from a diluted analysis.
E:	Result is beyond calibration limits and is estimated.
H:	Analysis was performed over the allowed holding time due to circumstances which were beyond laboratory control.
J:	Analyte was detected . However, the analyte concentration is an estimated value, which is between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL).
M:	Matrix spike recovery is outside control limits due to matrix interference. Laboratory Control Sample recovery was acceptable.
MCL:	Maximum Contaminant Level
NS:	No Standard Available
S6:	Surrogate recovery is outside control limits due to matrix interference.
S8:	The analysis of the sample required a dilution such that the surrogate concentration was diluted below the method acceptance criteria.
X:	Results represent LCS and LCSD data.

Definition:

%Limi:	Percent acceptable limits.
%REC:	Percent recovery.
Con.L:	Acceptable Control Limits
Conce:	Added concentration to the sample.
LCS:	Laboratory Control Sample
MDL:	Method Detection Limit is a statistically derived number which is specific for each instrument, each method, and each compound. It indicates a distinctively detectable quantity with 99% probability.

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Data Qualifiers and Descriptors

MS:	Matrix Spike
MS DU:	Matrix Spike Duplicate
ND:	Analyte was not detected in the sample at or above MDL.
PQL:	Practical Quantitation Limit or ML (Minimum Level as per RWQCB) is the minimum concentration that can be quantified with more than 99% confidence. Taking into account all aspects of the entire analytical instrumentation and practice.
Recov:	Recovered concentration in the sample.
RPD:	Relative Percent Difference

AMERICAN ANALYTICS CHAIN-OF-CUSTODY RECORD

9765 ETON AVE., CHATSWORTH, CA 91311
Tel: 818-998-5547 FAX: 818-998-7258

A.A. COC No.: 120635
70040824
Page 1 of 1

Client: ENVIRON
Project Name / No.: FMD & G-Inglewood GWCSD
Sampler's Name: J. Dishon
Project Manager: J. Dishon
Site Address: 5640 S. Fairfax Ave
Sampler's Signature:
Phone:
City: LA
P.O. No.:
Fax:
State & Zip: CA
Quote No.:

TAT Turnaround Codes **

1 = Same Day Rush
2 = 24 Hour Rush
3 = 48 Hour Rush
4 = 72 Hour Rush
5 = 5 Day Rush
X = 10 Working Days (Standard TAT)

ANALYSIS REQUESTED (Test Name)

Please enter the TAT Turnaround Codes ** below

Client I.D.	A.A. I.D.	Date	Time	Sample Matrix	No. of Cont	TPH-DRO	TPH-DRO w/silica gel	TRPH	TDS	pH	BTEX/MTBE (8260B)	BODS	Nitrate	Nitrite	Arsenic	Special Instructions
MW-6	4H21011-01	8/21/14	1200	W	8	X	X	X	X	X	X	X	X	X	X	*Barium
MW-7	-02	8/21/14	1010	W	8	X	X	X	X	X	X	X	X	X	X	Chromium
																Cobalt
																Copper
																Lead
																Zinc

For Laboratory Use

PRIORITY
Rush ___ Hrs SH ✓
Date 8/21/14 Time 18:00 Sign

A.A. Project No.: A641105 / 4H21011

Relinquished by	Date	Time	Received by
	8/21/14	1745	
Relinquished by	Date	Time	Received by
Relinquished by	Date	Time	Received by

Note: By relinquishing samples to American Analytics, client agrees to pay for the services requested on this chain of custody form and any additional client-requested analyses performed on this project. Payment for services is due within 30 days from the date of invoice. Sample(s) will be disposed of after 45 days following the submittal of the sample(s) to American Analytics.