Topock Project Executive Abstract

Document Title: Performance Assessment Report (PAR), Interim Measure No. 3 (IM3), Injection Well Field, Through December 2010; with included as Appendix A: Compliance Monitoring Program (CMP), Semiannual Groundwater Monitoring Report, Second Half 2010 Submitting Agency/Authored by: DTSC, RWQCB Final Document? ☒ Yes ☐ No	Date of Document: January 14, 2011 Who Created this Document?: (i.e. PG&E, DTSC, DOI, Other) PG&E Document ID: PGE20110114A
Priority Status: ☐ **HIGH** ☐ **MED** ☒ **LOW** Is this time critical? ☐ Yes ☒ No Type of Document: ☐ Draft ☒ Report ☐ Letter ☐ Memo ☐ Other / Explain:	Action Required: ☒ Information Only ☐ Review & Comment Return to: ______________________ By Date:______________________ ☐ Other / Explain:
What does this information pertain to? ☐ Resource Conservation and Recovery Act (RCRA) Facility Assessment (RFA)/Preliminary Assessment (PA) ☐ RCRA Facility Investigation (RFI)/Remedial Investigation (RI) (including Risk Assessment) ☐ Corrective Measures Study (CMS)/Feasibility Study (FS) ☐ Corrective Measures Implementation (CMI)/Remedial Action ☐ California Environmental Quality Act (CEQA)/Environmental Impact Report (EIR) ☒ Interim Measures ☐ Other / Explain:	Is this a Regulatory Requirement? ☒ Yes ☐ No If no, why is the document needed?
What is the consequence of NOT doing this item? What is the consequence of DOING this item? Submittal of this report is a compliance requirement of: 1) DTSC's January 5, 2007 letter approving continued operation of the IM3 injection wells and requiring PG&E to continue submitting a PAR every two years. 2) RWQCB Order No. R7-2006-0060 requires a quarterly CMP report.	Other Justification/s: ☐ Permit ☐ Other / Explain:

Brief Summary of attached document:

IM3 Injection Well Field PAR, Through December 2010. The purpose of this IM3 Injection Well Field PAR is to document the performance of injection wells operation and the influence of treated water on aquifer quality through December 2010. Injection of IM3 treated water began in August 2005. As of 4th quarter of 2010, the monitoring data show that the middle and deep zone observation wells show water quality similar to the injected water. The shallow zone observation wells have not yet shown the injected water quality. There are no indications of adverse effects to aquifer water quality as a result of the injection. Operating the injection wells reduces the adverse environmental and safety impacts associated with the trucking of treated groundwater to a permitted offsite facility. Reduced truck traffic results in lower vehicle emissions and reduces the chance of accidents.

The CMP, Semiannual Groundwater Monitoring Report, Second Half 2010 is included as Appendix A to this PAR.

Written by: PG&E

Recommendations:
This report is for your information only.

How is this information related to the Final Remedy or Regulatory Requirements:

The PAR is related to the Interim Measure, and is designed to monitor the performance of injection wells operation and the influence of treated water on aquifer water quality.

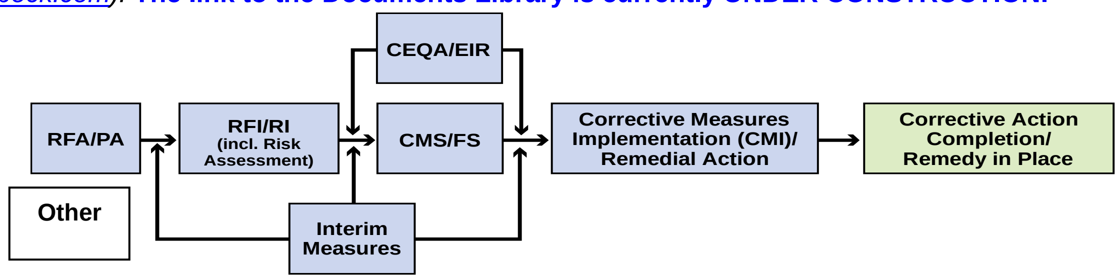
The CMP is related to the Interim Measure, designed to 1) monitor changes in groundwater hydraulics and/or water quality of the aquifer in the injection well area, and 2) to ensure that the quality of the aquifer is not adversely affected by the injected water.

Other requirements of this information?

None.

Related Reports and Documents:

Click any boxes in the Regulatory Road Map (below) to be linked to the Documents Library on the DTSC Topock Web Site (www.dtsc-topock.com). **The link to the Documents Library is currently UNDER CONSTRUCTION.**



Version 9

Legend
RFA/PA – RCRA Facility Assessment/Preliminary Assessment
RFI/RI – RCRA Facility Investigation/CERCLA Remedial Investigation (including Risk Assessment)
CMS/FS – RCRA Corrective Measure Study/CERCLA Feasibility Study
CEQA/EIR – California Environmental Quality Act/Environmental Impact Report

Pacific Gas and Electric Company

Yvonne J. Meeks
Manager

Environmental Remediation
Gas Transmission & Distribution

Mailing Address
4325 South Higuera Street
San Luis Obispo, Ca 93401

Location
6588 Ontario Road
San Luis Obispo, Ca 93401

805.234.2257
Fax:: 805.546.5232
E-Mail: YJM1@pge.com

January 14, 2011

Mr. Aaron Yue
Project Manager
California Environmental Protection Agency,
Department of Toxic Substances Control
5796 Corporate Avenue
Cypress, CA 90630

Subject: Performance Assessment Report, Interim Measure No. 3, Injection Well Field, PG&E Topock Compressor Station, Needles, California
(Document ID: PGE20110114A)

Dear Mr. Yue:

Enclosed is the Performance Assessment Report (PAR) for the Interim Measure No. 3 (IM No. 3) Injection Well Field at the Pacific Gas and Electric Company (PG&E) Topock Compressor Station. The first PAR for the IM No. 3 Injection Well Field was submitted on November 30, 2006 in conformance with California Environmental Protection Agency, Department of Toxic Substances Control (DTSC) conditional authorization (Condition 18) to begin operating the IM No. 3 facilities, dated July 15, 2005. In response to the submitted report, DTSC in its January 5, 2007 letter approved continued operation of the IM No. 3 injection wells, and also required PG&E to continue submitting a PAR every 2 years to evaluate the injection well operations and the influence of treated water on aquifer quality.

This PAR documents performance of the injection well operations and the influence of treated water on aquifer quality through December 2010. The report is submitted on January 14, 2011 to be consistent with the Compliance Monitoring Report (CMP) already scheduled for submittal on January 14, 2011.

Attached as Appendix A to the PAR is the Semiannual Groundwater Monitoring Report, Second Half 2010 for the Interim Measure Compliance Monitoring Program at the PG&E Topock Compressor Station. This CMP report presents the results of the second half (third and fourth quarter) 2010 CMP groundwater monitoring events and has been prepared in conformance with California Regional Water Quality Board, Colorado River Basin Region Order No. R7-2006-0060 as modified through August 28, 2008, as well as with the DTSC's July 15, 2005 letter approving the Compliance Monitoring Plan, the June 9, 2006 letter modifying the reporting requirements, and the December 12, 2008 and September 3, 2009 letters conditionally approving the August 2008 modifications to the Board Order.

If you have any questions regarding the PAR or the CMP report, please call me at (805) 546-5243.

Sincerely,

Yvonne Meeks
Topock Remediation Project Manager

cc: Robert Perdue, California Regional Water Quality Control Board, Colorado River Basin Region
Jose Cortez, California Regional Water Quality Control Board, Colorado River Basin Region

Enclosures: *Performance Assessment Report*, Interim Measure No. 3, Injection Well Field at the PG&E Topock Compressor Station

Final Report

Performance Assessment Report, Interim Measure No. 3 Injection Well Field,

PG&E Topock Compressor Station, Needles, California

Document ID: PGE20110114A

Prepared for

California Department of Toxic Substances Control

On behalf of

Pacific Gas and Electric Company

January 14, 2011

CH2MHILL

155 Grand Avenue, Suite 800
Oakland, CA 94612

Performance Assessment Report, Interim Measure No. 3 Injection Well Field January 2009 – December 2010

PG&E Topock Compressor Station, Needles, California

Prepared for

California Department of Toxic Substance Control

on Behalf of

Pacific Gas and Electric Company

January 14, 2011

This report was prepared under the supervision of a California Professional Engineer

REGISTERED PROFESSIONAL ENGINEER
JOHN S. PORCELLA
No. C70145
Exp. 9/30/12
CIVIL
STATE OF CALIFORNIA

John Porcella, P.E.
Project Engineer

Jay Piper
Project Manager

Contents

Appendix

Acronyms and Abbreviations

bgs	below ground surface
Cr	chromium
Cr(VI)	hexavalent chromium
CMP	Compliance Monitoring Program
CW	compliance well
DTSC	California Department of Toxic Substances Control
gpm	gallons per minute
IM	Interim Measure
IM No. 3	Interim Measure No. 3
IW	injection well
µg/L	micrograms per liter
mg/L	milligrams per liter
OW	observation well
PAR	Performance Assessment Report
PG&E	Pacific Gas and Electric Company
TDS	total dissolved solids
Water Board	California Regional Water Quality Control Board, Colorado River Basin
WDR	Waste Discharge Requirements

1.0 Introduction

Pacific Gas and Electric Company (PG&E) is implementing an Interim Measure (IM) to address chromium concentrations in groundwater at the Topock Compressor Station near Needles, California. The IM is implemented under the oversight of California Environmental Protection Agency, Department of Toxic Substances Control (DTSC) and consists of groundwater extraction for hydraulic control of the plume boundaries near the Colorado River floodplain and management of extracted groundwater. The groundwater extraction, treatment, and injection systems collectively are referred to as Interim Measure No. 3 (IM No. 3). Currently, the IM No. 3 facilities include a groundwater extraction system, conveyance piping, a groundwater treatment plant, and an injection well (IW) field for the discharge of the treated groundwater. Figure 1-1 shows the location of the IM extraction, conveyance, treatment, and injection facilities. The injection well field is composed of two injection wells and a network of monitoring wells.

On July 15, 2005, DTSC conditionally authorized PG&E to begin operating the IM No. 3 facilities, including the injection well field (DTSC, 2005a). As part of the authorization, DTSC considered the injection of treated water from the IM No. 3 system as a limited-duration pilot study, authorized through January 31, 2007. DTSC further directed that PG&E assess the performance of the injection well field and submit a report by November 30, 2006.

As directed, on November 30, 2006, PG&E submitted the first biennial *Performance Assessment Report IM3 Injection Well Field, PG&E Topock Compressor Station, Needles, California* (PAR) (CH2M HILL, 2006a) documenting performance of the IM No. 3 injection well field during the DTSC-mandated temporary operation period. Based on data presented in the November 2006 PAR, in a letter dated January 5, 2007 (DTSC, 2007a), DTSC approved the continued operations of the IM No. 3 injection wells and required PG&E to continue to submit a performance assessment report every 2 years to evaluate the injection well operations and the influence of treated water on aquifer quality.

This third biennial PAR documents performance of the injection well operations and the influence of treated water on aquifer quality through December 2010. The report was originally scheduled for submittal in November 2010; however, in an email dated November 23, 2010 (DTSC, 2010a), DTSC concurred with the PG&E proposal to defer the submission of the biennial report until January 15, 2011 and combine this report with the *Semiannual Groundwater Monitoring Report, Second Half 2010 for the Interim Measure Compliance Monitoring Program at the PG&E Topock Compressor Station, Needles, California* (Appendix A).

The submission of this third biennial report meets the requirement of Condition 18 in DTSC's July 15, 2005 and January 5, 2007 letters to assess the performance of the injection well field as a methodology for management of treated water from the IM No. 3 system beyond the pilot study period. This report briefly describes the background of the project and the IM No. 3 system, including the design basis. The report also discusses injection system operational performance, injection system maintenance activities, and groundwater quality and hydraulic changes associated with the injection system to provide the rationale for continued subsurface injection of treated groundwater.

1.1 History and Purpose of the Topock Interim Measure

The purpose of the IM at the Topock Compressor Station is to maintain hydraulic control of the groundwater plume boundaries in the Colorado River floodplain until the time that a final corrective action is in place at the site. As defined by DTSC, the performance standard for the IM is to "establish and maintain a net landward hydraulic gradient, both horizontally and vertically, that ensures that hexavalent chromium [Cr(VI)] concentrations at or greater than 20 micrograms per liter [µg/L] in the floodplain are contained for removal and treatment" (DTSC, 2005b).

PG&E began implementing the IM at the PG&E Topock site in March 2004. Initially, groundwater was extracted from a monitoring well cluster, MW-20, located on a bench above and to the west of the Colorado River floodplain (commonly referred to as the MW-20 bench). This operation was eventually replaced by the current groundwater extraction well system. Groundwater extraction began at wells TW-2S and TW-2D in May 2004, at well TW-3D in December 2005, and at well PE-1 in early 2006. Of the four extraction wells, two are currently in normal operation (TW-3D and PE-1).

Prior to the construction and operation of the current groundwater treatment and injection system, a batch treatment plant was located on the MW-20 bench, and treated groundwater was transported offsite for disposal at a permitted facility. While this operation was effective in controlling hydraulic gradients in the vicinity of the floodplain, it also generated a large number of truck trips from the site to the permitted disposal facility to manage the entire flow of extracted groundwater, and the treatment capacity was limited to approximately 80 gallons per minute (gpm) due to space limitations on the MW-20 bench.

Construction of the current IM No. 3 treatment and injection system began in September 2004 and was completed in July 2005. The existing groundwater treatment system is a continuous, multi-step process that involves removing chromium by chemical reduction, precipitation, and filtration, and reducing total dissolved solids (TDS) using reverse osmosis. The treatment plant is designed to treat up to 135 gpm of extracted groundwater. Treatment plant operation yields an effluent (injection) flow rate of approximately 125 gpm. The remaining flow (up to 15 gpm) becomes a reverse osmosis brine stream that is transported offsite for disposal at a permitted facility. Additional information on the treatment process performance and capacities is contained in the *Interim Measures No. 3 Treatment and Extraction System Operation and Maintenance Plan Rev. 1, PG&E Topock Compressor Station, Needles, California* (CH2M HILL 2006b) and the *Construction Completion Report, PG&E Topock Compressor Station, Needles, California* (CH2M HILL, 2005a).

Treated groundwater is returned to the aquifer through an injection system consisting of two wells, IW-2 and IW-3. Injection of treated groundwater from IM No. 3 began on July 31, 2005, as authorized by Waste Discharge Requirements (WDR) Order R7-2004-0103 (California Regional Water Quality Control Board, Colorado River Basin Region [Water Board], 2004). Treated groundwater from the Topock IM has been continuously managed through injection since that time.

WDR Order R7-2006-0060 (Water Board, 2006) was issued September 20, 2006 and is the successor to WDR Order No. R7-2004-0103. A revised Monitoring and Reporting Program under Order R7-2006-0060 was issued August 28, 2008 (Water Board, 2008).

In compliance with WDR Order R7-2006-0060, PG&E collects treated effluent samples from the IM No. 3 treatment plant and analyze for dissolved total chromium (Cr[T]), Cr(VI), metals, specific conductance, TDS, turbidity, flow rate, and major inorganic cations and anions, and water quality indicator parameters. The results of these analyses are reported quarterly to the Water Board, along with other required information and a summary of operations.

1.2 Description of Groundwater Injection Well Field

Treated effluent from the IM No. 3 treatment plant is pumped through an aboveground pipeline to the injection well field, located nearly 2,000 feet west of the plant. The well field, located on what is referred to as the East Mesa, is composed of two injection wells (IW-2 and IW-3). Surrounding the injection wells are three observation well clusters (OW-1, OW-2, and OW-5) located on the East Mesa. Surrounding the East Mesa are four additional monitoring well clusters, known as the compliance wells (CW-1, CW-2, CW-3, and CW-4). The locations of the injection wells, observation well clusters, and the compliance well clusters are shown in Figure 1-2.

Information for the three different well types is summarized in Table 1-1. The injection wells, observation well clusters, and compliance well clusters were installed between December 2004 and February 2005.

TABLE 1-1
Summary of Injection, Observation, and Compliance Wells Design Information and Installation Dates
Performance Assessment Report, IM No. 3 Injection Well Field, Topock Compressor Station, Needles, California

Well Type (IDs)	Description	Work Plan	Installation Date	Installation Report
Injection (IW-2, IW-3)	Six-inch diameter stainless-steel louvered screens connected to mild steel risers using a mechanical coupling device. One hundred and sixty-foot screened interval. Total depth of injection wells: 340 and 330 feet deep, respectfully. Two hundred gpm each design injection capacity.	CH2M HILL, 2004a	December 2004	CH2M HILL, 2005c
Observation (OW-1, OW-2, OW-5)	Monitoring well clusters consisting of three individual completions at various depths. Two-inch Schedule 40 polyvinyl chloride casing and screen. Twenty-foot screened interval.	CH2M HILL, 2004b	September to December 2004	CH2M HILL, 2005c
Compliance (CW-1, CW-2, CW-3, CW-4)	Monitoring well clusters consisting of two individual completions at various depths. Two-inch Schedule 40 polyvinyl chloride casing and screen. Fifty-foot screened interval	CH2M HILL, 2005b	January to February 2005	CH2M HILL, 2005c

Well IW-2 was completed to 340 feet below ground surface (bgs), with a screened interval from 170 to 330 feet bgs. Well IW-3 was completed to 330 feet bgs, with the screened interval from 160 to 320 feet bgs. The design injection capacity of 200-gpm each provides 50-percent excess capacity above the plant design capacity in each injection well, and the two wells also provide 100–percent injection well redundancy as only one well is in service at a time.

Two types of monitoring wells have been installed in the injection well field. Table 1-2 lists the name, well identifications, and monitoring zone of each type.

TABLE 1-2
Summary of Injection Field Monitoring Wells
Performance Assessment Report, IM No. 3 Injection Well Field, Topock Compressor Station, Needles, California

Group Name	Members	Distance from Injection Wells, feet	Monitoring Zones		
			Shallow	Mid-depth	Deep
Observation Wells	OW-1, OW-2, and OW-5	50 to 100	X	X	X
Compliance Wells	CW-1, CW-2, CW-3, and CW-4	300 to 550		X	X

Source: CH2M HILL, 2005c.

The procedures for maintaining the injection wells are described in the IM3 Injection Well Operation and Maintenance Plan (CH2M HILL, 2005d).

1.3 Compliance Monitoring Program

In compliance with the WDRs, a *Groundwater Compliance Monitoring Plan for Interim Measures No. 3 Injection Area, PG&E Topock Compressor Station, Needles, California* (CH2M HILL, 2005e) was prepared describing how the injection well field would be monitored to assess injection well performance. The observation well clusters, located relatively close to the injection wells, allow the measurement of changes in water chemistry and water levels across the entire aquifer thickness. Monitoring of the observation wells allows effects to groundwater quality from injection to be identified and evaluated promptly during the operation of the groundwater injection system. Corrective action can be taken accordingly for any potential negative effects that may arise—such as aquifer plugging, excessive mounding, or mobilization of trace metals from the aquifer matrix—before the effect progresses beyond the injection points.

The four compliance well clusters, located approximately 500 feet from the injection wells, monitor the influence of injection over a much larger area. They are primarily intended for monitoring groundwater quality and compliance with the waste discharge permit. The compliance well clusters were installed both upgradient and downgradient of the injection wells. They were located so that groundwater would take several years to travel to them from the injection wells (as estimated by groundwater modeling, and since confirmed during IM3 operation).

On January 22, 2007 (DTSC, 2007b), DTSC approved a modification to the suite of constituents analyzed during quarterly sampling of the Compliance Monitoring Program (CMP) observation wells (CH2M HILL, 2006c). The Water Board concurred in a letter dated January 23, 2007 (Water Board, 2007a).

On October 16, 2007, the Water Board approved collecting pH measurements in the field rather than through laboratory analysis due to the new 15-minute holding time for laboratory measurements with United States Environmental Protection Agency Method 150.1 (Water Board, 2007b). DTSC provided concurrence for the field pH change in an email dated January 22, 2008 (DTSC, 2008). This change became effective with the first quarter 2008 sampling event.

On November 13, 2007, the Water Board approved a modification to hexavalent chromium (Cr[VI]) analytical methods, which extended the holding time from 24 hours to 28 days (Water Board, 2007c). DTSC provided concurrence for the 28-day holding time for Cr(VI) analyses in an e-mail dated January 22, 2008 (DTSC, 2008a). The first quarter 2008 CMP sampling event was the first event to incorporate the new 28-day holding time for analyzing Cr(VI).

PG&E proposed modifications to the CMP, including the sampling and reporting frequency and the field pH trigger range for the CMP contingency plan, to the Water Board and the DTSC on July 3, 2008. On August 28, 2008, the Water Board approved these modifications as Revision 1 to the MRP (Water Board, 2008). On December 12, 2008, the modification of the CMP contingency plan pH range to a field pH range of 6.2 to 9.2 was also approved by the DTSC (DTSC, 2008b). The remaining MRP modifications were approved by DTSC on September 3, 2009 (DTSC, 2009).

As of October 2010, samples are collected from observation wells (OW) and compliance wells (CW) according to the following schedule:

- Three OWs (OW-1S, OW-2S, and OW5S) located near the IM No. 3 injection well field are sampled semiannually (during the second and fourth quarters) for a limited suite of constituents.
- Six OWs (OW-1M, OW-1D, OW-2M, OW-2D, OW-5M, and OW-5D) are:
    - Sampled annually for a limited suite of constituents during the fourth quarter.
    - Sampled for a full suite of constituents one cluster at a time on a triennial (once every 3 years) schedule. Within a 3-year period, all OW middle and deep wells will be sampled for a full suite of constituents. The triennial sampling will occur during the annual event (fourth quarter).
- Eight CWs are sampled semiannually for a limited suite of constituents and annually (during the fourth quarter) for a full suite of constituents.

Monitoring data from the CMP have been collected and submitted in conformance with requirements of the WDRs. Groundwater monitoring reports pursuant to the CMP have been completed and submitted to DTSC since startup of the IM No. 3 injection system. The CMP reports are listed in Section 5.0 (CH2M HILL, 2005f-g, 2006d-f, 2007a-d, 2008a-d). The *Semiannual Groundwater Monitoring Report, Second Half 2010 for the Interim Measure Compliance Monitoring Program at the PG&E Topock Compressor Station, PG&E Topock Compressor Station, Needles, California* is attached as Appendix A.

2.0 Injection Well Operational Assessment

2.1 Injection Well Performance

The injection well field is designed to accept all of the treated water from the IM No. 3 treatment plant. This is the primary performance metric. Table 2-1 lists the average injection rate, monthly and cumulative total volume of water injected, and the primary wells in service from August 2005 through December 2010.

TABLE 2-1
Injection Rates and Volumes
Performance Assessment Report, IM No. 3 Injection Well Field, Topock Compressor Station, Needles, California

Date	Average Injection Rate (gpm)	Monthly Total (gallons)	Cumulative Total (gallons)	Primary Injection Well in Service
August-05	58.8	2,626,360	2,626,360	IW-2
September-05	67.2	2,904,094	5,530,454	IW-2
October-05	80.6	3,597,275	9,127,729	IW-2
November-05	74.5	3,216,979	12,344,708	IW-2
December-05	103.5	4,622,252	16,966,960	IW-2
January-06	113.5	5,067,560	22,034,520	IW-2
February-06	121.4	4,896,522	26,931,042	IW-2
March-06	121.1	5,405,223	32,336,265	IW-2
April-06	116.7	5,039,655	37,375,920	IW-2
May-06	118.9	5,305,831	42,681,751	IW-2
June-06	116.9	5,050,593	47,732,344	IW-2
July-06	119.2	5,322,857	53,055,201	IW-2
August-06	121.6	5,429,628	58,484,829	IW-3
September-06	121	5,229,047	63,713,876	IW-3
October-06	122.6	5,473,384	69,187,260	IW-3
November-06	122.1	5,275,516	74,462,776	IW-3
December-06	124.1	5,542,012	80,004,788	IW-3
January-07	123.5	5,510,915	85,515,703	IW-3
February-07	126	5,079,402	90,595,105	IW-3
March-07	123.8	5,525,669	96,120,774	IW-2
April-07	96.5	4,169,396	100,290,170	IW-3
May-07	126.8	5,658,656	105,948,826	IW-3
June-07	127.3	5,499,332	111,448,158	IW-3

TABLE 2-1
Injection Rates and Volumes
Performance Assessment Report, IM No. 3 Injection Well Field, Topock Compressor Station, Needles, California

Date	Average Injection Rate (gpm)	Monthly Total (gallons)	Cumulative Total (gallons)	Primary Injection Well in Service
July-07	122.1	5,448,764	116,896,922	IW-2
August-07	125.8	5,614,418	122,511,340	IW-3
September-07	128.1	5,531,784	128,043,124	IW-3
October-07	128.1	5,717,776	133,760,900	IW-3
November-07	124.1	5,361,317	139,122,217	IW-3
December-07	124.6	5,560,689	144,682,906	IW-3
January-08	123.1	5,492,958	150,175,864	IW-3
February-08	126.5	5,283,674	155,459,538	IW-3
March-08	124.3	5,550,583	161,010,121	IW-3
April-08	93.5	4,040,973	165,051,094	IW-3
May-08	124.2	5,542,847	170,593,941	IW-3
June-08	128.6	5,553,857	176,147,798	IW-3
July-08	127.4	5,685,501	181,833,299	IW-3
August-08	127.7	5,702,022	187,535,321	IW-2
September-08	120.2	5,193,691	192,729,012	IW-3
October-08	125.7	5,613,447	198,342,459	IW-2
November-08	128.4	5,548,109	203,890,568	IW-3
December-08	124.2	5,542,252	209,432,820	IW-3
January-09	123.6	5,517,257	214,950,079	IW-3
February-09	131.5	5,303,429	220,253,508	IW-3
March-09	125.9	5,618,103	225,871,612	IW-3
April-09	101.2	4,372,758	230,244,370	IW-3
May-09	122.8	5,482,349	235,726,719	IW-3
June-09	125.5	5,420,397	241,147,116	IW-2
July-09	83.4	3,725,059	244,872,175	IW-3
August-09	127.3	5,680,943	250,553,118	IW-3
September-09	93.7	4,046,699	254,599,817	IW-2
October-09	131.1	5,853,536	260,453,352	IW-2
November-09	130.5	5,639,433	266,092,786	IW-2
December-09	120.5	5,377,155	271,469,941	IW-3
January-10	126.3	5,637,472	277,107,412	IW-3

TABLE 2-1
Injection Rates and Volumes
Performance Assessment Report, IM No. 3 Injection Well Field, Topock Compressor Station, Needles, California

Date	Average Injection Rate (gpm)	Monthly Total (gallons)	Cumulative Total (gallons)	Primary Injection Well in Service
February-10	124.8	5,031,840	282,139,252	IW-3
March-10	126.0	5,625,524	287,764,777	IW-3
April-10	112.0	4,839,690	292,604,467	IW-3
May-10	131.8	5,882,290	298,486,757	IW-3
June-10	123.9	5,354,115	303,840,872	IW-3
July-10	120.8	5,390,898	309,231,770	IW-2
August-10	118.8	5,302,122	314,533,892	IW-3
September-10	131.2	5,667,255	320,201,147	IW-3
October-10	126.8	5,658,794	325,859,940	IW-2
November-10	130.3	5,629,913	331,489,853	IW-2
December-10	129.4	5,774,967	337,264,820	IW-3

Source: The injection flow rate is measured by flow meters mounted in the piping leading into IW-02 and IW-03. Data are logged in the IM No. 3 control system, from which this information is reported.

The performance of the two injection wells has been monitored since they went into service on July 2005. A summary of operational status of IM No. 3 injection wells from July 2005 through December 2010 is presented in Table 2-2. Injection well performance is measured in terms of specific injectivity, which is measured in gpm of flow per foot of decreased head in the well (water level rise). Over time, the specific injectivity of injection wells typically declines due to plugging of pores from suspended solids in the injectate, precipitation of minerals in the well bore, air entrapment in the formation, biofouling, or a combination.

TABLE 2-2
Operational Status of IM No. 3 Injection Wells from July 2005 – December 2010
Performance Assessment Report Interim Measure No. 3 Injection Well Field, Topock Compressor Station, Needles, California

Time Period	Primary Injection Well in Service	Comments
July 31, 2005 to Fourth Quarter 2005	IW-2	
First Quarter 2006	IW-2	Injection occurred primarily at IW-2, except during periods of operational testing, when injection was divided equally between IW-2 and IW-3.
Second Quarter 2006	IW-2	Injection occurred primarily at IW-2, except during periods of operational testing, when injection was divided equally between IW-2 and IW-3.
Third Quarter 2006	IW-3	In August 2006, IW-2 went offline for routine maintenance, and injection commenced at IW-3.
Fourth Quarter 2006	IW-3	Injection occurred at IW-3, except during routine maintenance.

TABLE 2-2
Operational Status of IM No. 3 Injection Wells from July 2005 – December 2010
Performance Assessment Report Interim Measure No. 3 Injection Well Field, Topock Compressor Station, Needles, California

Time Period	Primary Injection Well in Service	Comments
First Quarter 2007	IW-3	Injection occurred at IW-3 and switched over to IW-2 on March 8.
Second Quarter 2007	IW-3	Injection occurred at IW-3 from April 3 through June 20. Injection switched to IW-2 on June 20 and continued through July 20, 2007.
Third Quarter 2007	IW-3	Injection occurred at IW-3 after July 20. Injection occurred at IW-2 on August 30 for an injection test and then returned to IW-3 after August 31.
Fourth Quarter 2007	IW-3	Injection occurred at IW-3 and then switched to IW-2 on September 25 for routine maintenance. Injection returned to IW-3 after October 9.
First Quarter 2008	IW-3	Injection occurred at IW-3 only. From February 5 through February 13, mechanical well rehabilitation activities were conducted at IW-2.
Second Quarter 2008	IW-3	Injection occurred at IW-3 only. IM-3 system offline from April 21 through April 28 due to routine maintenance. Backwashing occurred at IW-3 on April 9, May 7, May 15, May 22, June 3, and June 4, 2008.
Third Quarter 2008	IW-3	Injection occurred primarily at IW-3. Injection also occurred at IW-2 for short period on July 25 and from August 12-31, 2008. Backwashing events occurred at IW-3 on June 17, June 27, July 9, July 15, July 17, July 18, August 12, August 13, September 2, September 3, and from September 23-25, 2008. Backwashing events occurred at IW-2 from September 9-11, 2008.
Fourth Quarter 2008	IW-3/IW-2	Injection occurred primarily at IW-2 in October 2008, IW-3 in November 2008, and approximately equally between IW-2 and IW-3 in December 2008. Backwashing events occurred at IW-2 on October 7-8, 2008 and on November 25, 2008. Backwashing events occurred at IW-3 on November 4-5, 2008 and on December 8, 9 and 11, 2008.
First Quarter 2009	IW-3/IW-2	Injection occurred primarily at IW-3 in February and March 2009, and nearly equal between IW-2 and IW-3 in January 2009. Routine and scheduled maintenance occurred 12/18/08 and 1/21/09 at which time both wells were offline.
Second Quarter 2009	IW-3/IW-2	Injection occurred primarily at IW-3 in April and May 2009, shortly switched to IW-2 from May 26~31, 2009, and approximately equal injection in IW-2 and IW-3 in June 2009. Injection ceased from April 20, 2009 to April 27, 2009 for routine maintenance.
Third Quarter 2009	IW-3/IW-2	Injection occurred primarily at IW-3 in July and August 2009, Injection also occurred primarily at IW-2 in September 2009, with a short period from September 1 to 7, 2009 at IW-3. Unplanned downtime occurred from September 9-14, 2009.
Fourth Quarter 2009	IW-2	Injection occurred at IW-2 until November 25, 2009 when it switched to IW-3. Injection continued at IW-3, except during times of routine maintenance.

TABLE 2-2
Operational Status of IM No. 3 Injection Wells from July 2005 – December 2010
Performance Assessment Report Interim Measure No. 3 Injection Well Field, Topock Compressor Station, Needles, California

Time Period	Primary Injection Well in Service	Comments
First Quarter 2010	IW-3	Injection occurred primarily at IW-3, and shortly switched to IW-2 from March 3 to 17, 2010. Mechanical well rehabilitation activities were conducted at IW-2 during February, 2010.
Second Quarter 2010	IW-3	Injection occurred primarily at IW-3, and switched to IW-2 during the periods of April 8~19, May 7~21, and June 17~30, 2010.
Third Quarter 2010	IW-2/IW-3	During the third quarter 2010, injection occurred primarily at IW-3 with the exception of the following periods when it primarily occurred at IW-2: July 1 – July 21, August 26 – 31, September 8 – 15.
Fourth Quarter 2010	IW-2/IW-3	During the fourth quarter 2010, injection occurred primarily at IW-2 with the exception of the following periods when it primarily occurred at IW-3: October 1 – 15, November 5-18, and December 17-31, 2010.

As indicated in Table 2-1, for the first reporting period (August 2005 through October 2006), IW-2 was used almost exclusively. The initial specific injectivity of IW-2 was approximately 33 gpm per foot; however, by the summer of 2005, the specific injectivity was measured as approximately 18 to 20 gpm per foot (Figure 2-1). Backwashing was conducted between July and November 2006 in an effort to restore the specific injectivity of IW-2; however, over time, IW-2 exhibited progressive loss in specific injectivity that backwashing was unable to reverse. IW-2 was removed from service from September 2006 through August 2008 in preparation for well rehabilitation (IW-3 was put into service during this time). The specific injectivity of IW-2 ranged from roughly 9 to 13 gpm per foot before it was removed from service in September 2006.

Based on the IW-2 well video survey conducted on November 13, 2007, moderate geochemical fouling in the form of a black-colored precipitate (believed to be manganese) was observed throughout the well. The precipitation of the black material was believed to be the principal cause of the decrease in IW-2's specific injectivity. Mechanical well rehabilitation efforts were conducted during February and March 2008 at IW-2 in an effort to restore the specific injectivity using less aggressive rehabilitation methods compared to chemical treatment methods. Mechanical rehabilitation methods, including brushing, bailing, over-pumping and surging, and airlift swabbing were employed to remove the solids and precipitate buildup. These efforts resulted in a measured increase in the specific capacity from 9 to 19 gpm per foot once the well was returned to service in August 2008.

Despite mechanical well rehabilitation and backwashing efforts conducted at IW-2 during 2008, the specific injectivity increase was short lived and it declined from 19 to roughly 3 gpm per foot between September 2008 and November 2009; therefore, a second mechanical rehabilitation effort was conducted at IW-2 during February 2010. The specific injectivity increased from 3 to 12 gpm per foot but the increase in the specific capacity was again short lived and declined to roughly 9 between February and November 2010.Injection well IW-3 was in service from September 2006 through August 2008 and was used almost exclusively during this time as indicated in Table 2-1. The initial specific injectivity of IW-3 was approximately 35 to 38 gpm per foot, but it also declined to roughly 8 to 13 gpm per foot by September 2008 even though backwashing was conducted regularly. IW-2 was returned to service in September 2008, and the two injection wells were alternated until November 2009 when mechanical well rehabilitation efforts were conducted at IW-3. The specific injectivity increased from roughly 8 to 19 gpm per foot after completing mechanical well rehabilitation at IW-3, but the increase in specific injectivity was also short lived; it declined to 5 gpm per foot by February 2010.

Manganese was believed to be the primary cause of injection well plugging throughout the life of both injection wells. Manganese is a byproduct in the treatment plant at IM No. 3 and, before March 2010, the effluent manganese concentrations varied sporadically, ranging from non-detect (< 10 μg/L) up to 100 μg/L. Since February 2010, changes were implemented at the IM No. 3 treatment plant to reduce manganese in the effluent. The effluent manganese concentrations during March 2010 through December 2010 have been more stable and have been less than 15 μg/L. The reduction in manganese may be the reason for the subtle upward trend observed in the specific injectivity after March 2010 as seen in IW-3 and subtly in IW-2 (Figure 2-1). The specific injectivity of IW-3 increased from roughly 5 to 9 gpm per foot from March to October 2010.

More aggressive rehabilitation efforts were conducted at both wells during October and November 2010 using chemical treatment methods. A 10 percent hydrochloric acid solution was injected and agitated into the well screen sections before aggressive and extensive swabbing and removal of dissolved manganese by pumping and surging. The specific injectivity in both wells increased from roughly 9 to 25 gpm per foot after chemical rehabilitation efforts were completed (Figure 2-1).

Backwashing of the injection wells will continue for the near future to maintain the specific injectivity. The injection wells will be operated on an alternating schedule, with each well receiving injection for roughly 2 to 4 weeks then off-line for 2 to 4 weeks, with a backwash event occurring before being returned to service. This schedule will result in 6 months of idle time and 12 backwash events per well per year. If performance indicates a drop in specific injectivity, then the wells will either be backwashed more frequently or be rehabilitated using aggressive chemical methods.

It is important to note that each individual injection well currently has sufficient capacity to inject the entire capacity of the treatment plant effluent. The system has adequate spare capacity, and the maintenance program is implemented to maintain sufficient capacity for operation. The proposed maintenance schedule will be evaluated for the benefit of frequent backwashing during the year versus annual backwashing at the end of the year.

2.2 Effect of Injection on Groundwater Levels

As shown in Table 2-1, the combined injection rates at IW-2 and IW-3 have ranged between 83.4 and 131.8 gpm since November 2006. Groundwater levels have been monitored in all observation and compliance wells since several months before starting injection. Figures 2-2 through 2-8 are hydrographs that illustrate groundwater elevation trends and vertical hydraulic gradients observed over the reporting period at the observation and compliance monitoring wells. Average vertical gradients have been upward at the observation well and compliance well clusters since injection began. The observed gradients are consistent with IM3 design expectations. Because the injection wells are screened in the deeper portions of the aquifer, the injection of treated water into the deep zone of the aquifer tends to increase the head in the deep and middle portions of the aquifer more than in the shallow portion. Groundwater levels in the middle and deep observation and compliance wells respond more quickly to changes in injection rate than shallow water levels. This is partially due to the semi-confined nature of the aquifer in middle and lower zones. Confined and semi-confined aquifers typically have storage coefficients several orders of magnitude smaller than unconfined aquifer systems and therefore respond much more quickly to changes in hydraulic stress. The other reason for this observation is that the vast majority of injected water is flowing into the deep zone, based on spinner log borehole flow profile data collected shortly after the injection well installation. Moreover, the aquifer response of the middle and deep wells to the injected water is generally comparable for all the biennial reporting periods (first biennial reporting period August 2005 through October 2006, second biennial reporting period November 2006 through December 2008, and the current biennial reporting period January 2009 through December 2010).

Figures 2-9 and 2-10 present recent water level contour maps for middle and deep wells using November 2010 data. Similarly, Figures 2-11 and 2-12 present water level contour maps for middle and deep wells using October 2008 data. For the past two years, the injection rate at IM No. 3 injection well field has averaged approximately 122 gpm. Over the past four years of injection, the water level contour patterns are comparable for both middle and deep wells, respectively, indicating that the groundwater levels in the middle and deep zones are currently in near hydraulic steady-state with the current rate of injection. Figure 2-13 and 2-14 present water-level contour maps for middle and deep wells using September 2006 data. Comparison between these Figure sets does not show significant change in water level contours over four years of IM No.3 operation. It is, therefore, not anticipated that continued injection at the current rate will result in any further significant changes in groundwater level, flow directions, or velocities in the injection well field.

The groundwater mound associated with injection is broader and flatter in the deep zone. The mound in the middle zone is more localized around the injection wells. This is consistent with the spinner log results from both injection wells, which showed higher permeability in the deep zone. The mound displays less than a foot of total height in either middle or deep zones, as measured by the difference between observation well and compliance well groundwater elevations, as shown in Figures 2-9 and 2-10. This represents a slight increase in the magnitude of the horizontal gradient, although this increase is restricted to the area of the mound itself. Outside of the defined mound area, there is no significant effect of injection on groundwater levels.

The mound is elliptical in shape, with the major axis running in a southwest to northeast direction. The lower gradients (more widely spaced contours) in the direction of the major axis are an indication that the aquifer permeabilities are greater in this direction, indicating that there may be a preferred direction to flow in this area. In aquifers in alluvial fan depositional environments, the permeability is often higher in the down-fan direction and lower in the cross-fan direction. This is due to the higher degree of connectedness of the sand and gravel layers in the direction of stream flow on the former fans (Fetter, 1994). The orientation of the long axis of the mound near the injection well field is northeast-southwest and generally consistent with the likely alignment of alluvial fans in the area.

3.0 Influence of Treated Water on Aquifer Water Quality

3.1 Treatment Plant Effluent Water Quality and Groundwater Quality Before and After Injection

Injection of treated water began on July 31, 2005. Under WDR No. R7-2006-0060 for the IM No. 3 groundwater treatment system, PG&E is required to submit WDR monitoring reports on the operation of the system. These reports contain the analytical results of treated water effluent sampling and, as such, the reports are useful in determining the baseline water quality of the treated water being injected into the IM No. 3 injection well field.

Selected effluent water analytical results are from three of the monthly reports: August 29, 2005, July 2, 2007, and October 5, 2010. While there are differences among some parameters in these samples, a number of parameters show relatively consistent concentrations in the effluent over time. Analytes that have relatively consistent concentration over the time period include Cr(VI), chromium, fluoride, molybdenum, nitrate/nitrite as nitrogen, sulfate, and TDS. These seven constituents provide a characterization of the effluent that does not appear to vary greatly over time and can serve as a basis for determining if a groundwater monitoring well is being affected by injection. In general terms, treated water has the following characteristics (based on review of December 2005 through October 2010 effluent characteristics):

- Cr(VI): typically less than reporting limits1.0 µg/L
- Chromium: typically less than reporting limits (1.0µg/L)
- Fluoride: approximately 2 mg/L
- Molybdenum: approximately 15 µg/L
- Nitrate/nitrite as nitrogen: approximately 3.0 mg/L
- Sulfate: approximately 500 mg/L
- TDS: approximately 4,000 mg/L

A full set of nine observation well groundwater samples were collected on July 27 and 28, 2005, and a full set of eight compliance well groundwater samples were collected on September 13 through September 15, 2005. These samples are considered representative of conditions unaffected by injection and serve to characterize the pre-injection water quality. By considering the set of seven parameters and focusing on those parameters that show significant differences, it is relatively easy to distinguish between the pre-injection water quality at the monitoring wells and the treated water effluent quality.

The following wells display the general characteristics of treated water: OW-1M, OW-1D, OW-2M, OW-2D, OW-5M, OW-5D, CW-1M, CW-1D, CW-2D, CW-3D, and CW-4D. These wells are at locations and depths where the treated water injection front has largely replaced the local pre-injection groundwater. Wells CW-2M and CW-4M have chemical characteristics approaching that of treated water. To date, all shallow observations wells

(wells OW-1S, OW-2S, and OW-5S) and compliance well CW-3M do not show water quality effects due to injection of treated water, indicating that injected water has not yet reached these depths and locations. However, wells OW-1S and OW-5S have shown increasing trends in TDS over the past year, suggesting that the injection front is approaching these wells.

3.2 Water Quality Trends

Trend data can be used to determine when a rapid change has occurred between sampling events, such as the arrival of the injection front. It can also be used to look at more gradual changes that occur over several sampling events, such as seasonal effects or the interaction of treated water with local groundwater and host aquifer material. Eleven analytes were selected for time-series analysis; these analytes are considered to be most representative of the IM No. 3 injection well field area and have sufficient detections to make time-series analysis useful. The analytes include chloride, chromium, fluoride, Cr(VI), molybdenum, nitrate/nitrite as nitrogen, pH, sodium, sulfate, TDS, and vanadium. Water quality hydrographs (time-series plots) of these 11 analytes in each observation well during the second half 2010 within the IM No. 3 injection well field are presented in Figures 3-1 through 3-5. The graphs are divided into the three depth (shallow, mid, and deep) intervals for the observation wells, followed by the two intervals for the compliance wells. The effluent water quality information is also presented on these figures for comparative purposes. (Starting with the first quarter 2008, pH measurements on groundwater samples were no longer made through laboratory analysis due to the new 15-minute holding time for laboratory measurements with United States Environmental Protection Agency Method 150.1).

Observation well water quality hydrographs are presented in Figures 3-1 through 3-3. These hydrographs show the same overall patterns: wells that are identified as affected by treated water injection show a shift in water quality for characteristic parameters, while those identified as being unaffected by injection show no net trends. The water quality change brought on by the arrival of the treated water injection front can be either gradual (OW-5M) or step-wise (OW-2M), with most affected wells showing a pattern of change somewhere between the two. Based on the variability in response, it is inferred that the movement of treated water is non-uniform laterally between wells. This variability in lateral movement can be inferred from differences in the water quality hydrographs in both the mid-depth and deep wells.

The OW shallow-depth wells (OW-1S, OW-2S, and OW-5S) showed little water quality variation through 2009. During 2010 however, samples from wells OW-1S and OW-5S have shown changes in water quality towards that of the effluent. Though they were not identical with effluent in October 2010, the changes suggest that the effluent front is approaching the shallow zone at these two well locations.

Compliance well water quality hydrographs are presented in Figures 3-4 and 3-5. Wells CW-1M, CW-1D, CW-2D, CW-3D, and CW-4D show trends in TDS, sulfate, nitrate/nitrite as nitrogen, chromium, molybdenum and Cr(VI) similar to the treated water. Wells CW-1M, CW-2M, and CW-4M show decreasing trends in Cr(VI) and chromium. These changes are attributed to the arrival of injection water. For a more detailed discussion, see Appendix A.

During the second half of 2010, none of the samples collected from shallow, middle, and deep wells exceeded the interim action level of 32.6 µg/L for Cr(VI), except for one sample collected from one well, OW-2S (34.3 µg/L). The concentration of Cr(VI) is not related to injected water (which consistently has significantly lower Cr(VI) and chromium concentrations than all wells) but instead is related to the natural variability of background water quality within the shallower portions of the groundwater aquifer. From the reporting period of January 2009 to December 2010, samples collected from one well, OW-2S, exceeded the water-quality objective of 28 µg/L for Cr. The January 6, 2009, July 8, 2009, October 13, 2009, April 8, 2010, and October 15, 2010 samples from well OW-2S had concentrations of 33.2 µg/L, 30.7 µg/L, 31.8 µg/L, 30.6 µg/L, and 29.3 µg/L, respectively. These results exceeded the hexavalent chromium and chromium water quality objectives of 32.6 and 28 µg/L, respectively. The concentrations of hexavalent chromium and chromium are not related to injected water (which consistently has significantly lower hexavalent chromium and chromium concentrations than well OW-2S) but instead is related to the natural variability of background water quality within the shallower portions of the groundwater aquifer. Because of this reason, DTSC and the Water Board have stated in letters to PG&E that it is not necessary to follow contingency plan requirements for hexavalent chromium [Cr(VI)] and chromium with respect to OW-2S and OW-5S. No other samples exceeded the interim action level for Cr(VI) or water quality objective for Cr from the July 1 through December 31, 2010 sampling.

4.0 Summary and Recommendations

The IM No. 3 groundwater injection system has operated successfully since July 31, 2005 and has been shown to be an effective strategy for management of treated groundwater generated through implementation of the IM at the PG&E Topock Compressor Station. The following summarizes the performance highlights of the injection system.

- **Predicted aquifer response**: The aquifer has responded hydraulically to the injection as expected. The groundwater mound near the injection wells is predominantly in the middle and deep aquifer zones and appears to show the influence of preferential permeability in the deep zone. The magnitude of the mound in the area of the nearby OW wells is approximately 0.8 feet in the deep zone and 0.6 feet in the middle zone, and the magnitude dissipates with distance from the injection well. The direction of preferential flow appears to be in a northeast/southwest direction parallel with the depositional grain of the alluvial fan in the area of the injection wells. Preferential flow along the axis of an alluvial fan results from the alignment of sand and gravel layers along the stream channels as the fan is deposited (Fetter, 1994). Sand and gravel grains will tend to align with their long sides in the direction of the flow of water that deposits them off the fan. This alignment results in higher hydraulic conductivity in this direction than in the transverse or vertical directions.
- **No adverse affect to aquifer water quality**: There are no indications of adverse effects to aquifer water quality as a result of the injection. No unexpected or adverse geochemical reactions have been observed. The water quality in the middle and deep zones is generally improving in areas where the injected water has displaced the native groundwater. Injected water has not directly affected the shallow aquifer zone, although some water quality changes observed in the shallow zone may be associated with changes in localized groundwater flow directions associated with the injection.
- **Limited effect on shallow groundwater**: As expected, injected water is moving through the aquifer almost entirely in the middle and deep zones. Only recent minor effects in two shallow observation wells have been observed. Adverse effects of injection, if any, would therefore be seen first in the middle and deep zones, with a significant lag in time before arriving at shallower depths.
- **Successful injection well operation**: The injection wells have performed without significant problems for the third biennial reporting period, maintaining sufficient injection capacity throughout operation even though injection well performance declined during the life of the wells. Well rehabilitation and backwashing implemented at both wells has improved and sustained the specific injectivity (Figure 2-1). Moreover, alternate use of both the injection wells has allowed smooth operation of the IM No. 3 injection well field. Backwashing will be implemented on a regular basis at each well to sustain the efficiency and well performance at both injection wells.
- **Improved environment and safer operations**: Operating the injection wells reduces the adverse environmental and safety impacts associated with the trucking of treated

groundwater to a permitted offsite facility (offsite disposal of the [estimated at report preparation, will be updated] 336 million gallons injected through December 2010 would have required over 56,000 tanker truck trips). Reduced truck traffic results in lower vehicle emissions and reduces the chance of accidents.

For these reasons, PG&E plans continued operation of the injection system, under DTSC oversight, as an effective method for managing the treated water and as an integral part of IM No. 3 system operations.

5.0 References

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Figures

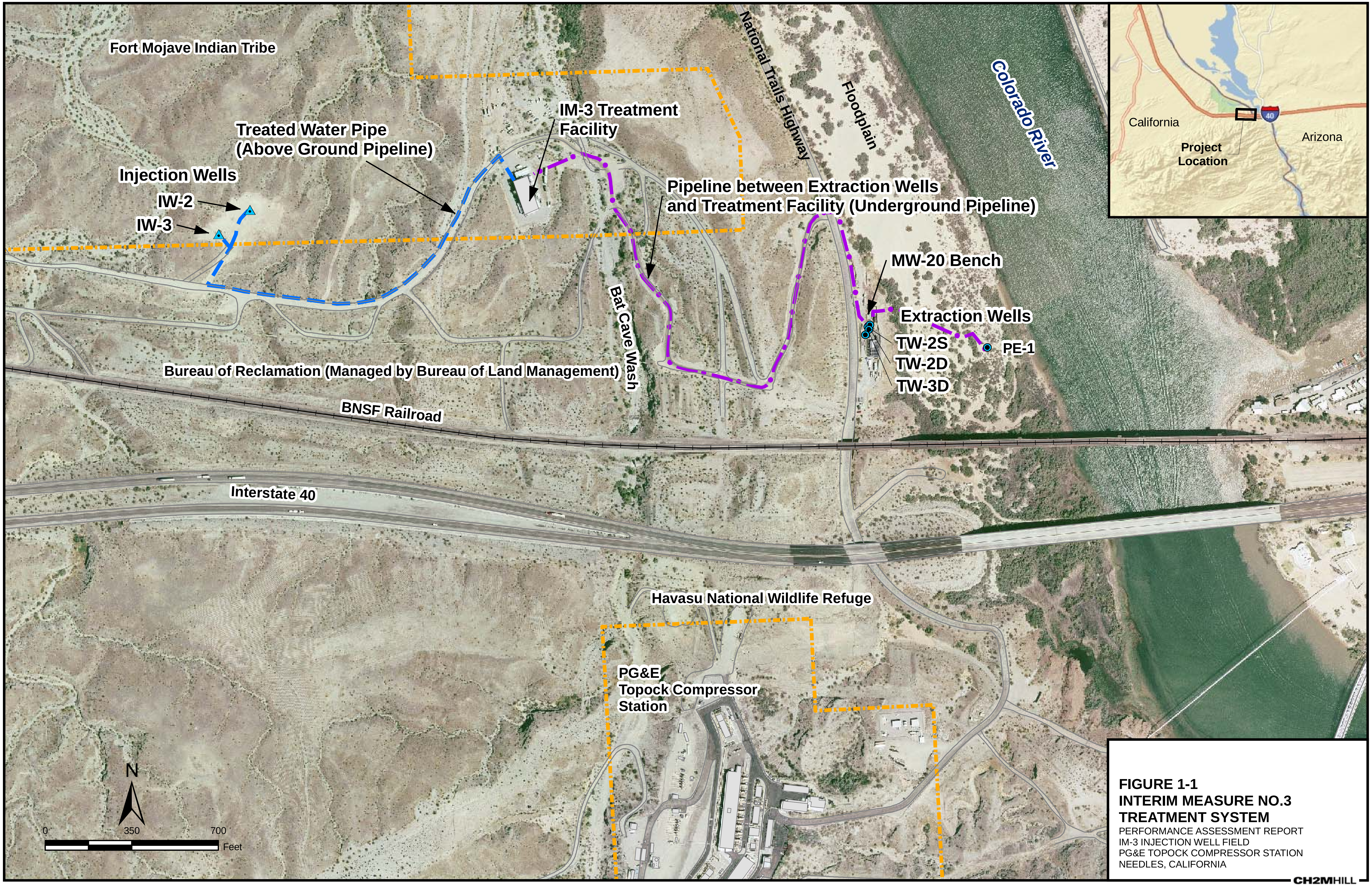

FIGURE 1-1
INTERIM MEASURE NO.3
TREATMENT SYSTEM
PERFORMANCE ASSESSMENT REPORT
IM-3 INJECTION WELL FIELD
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

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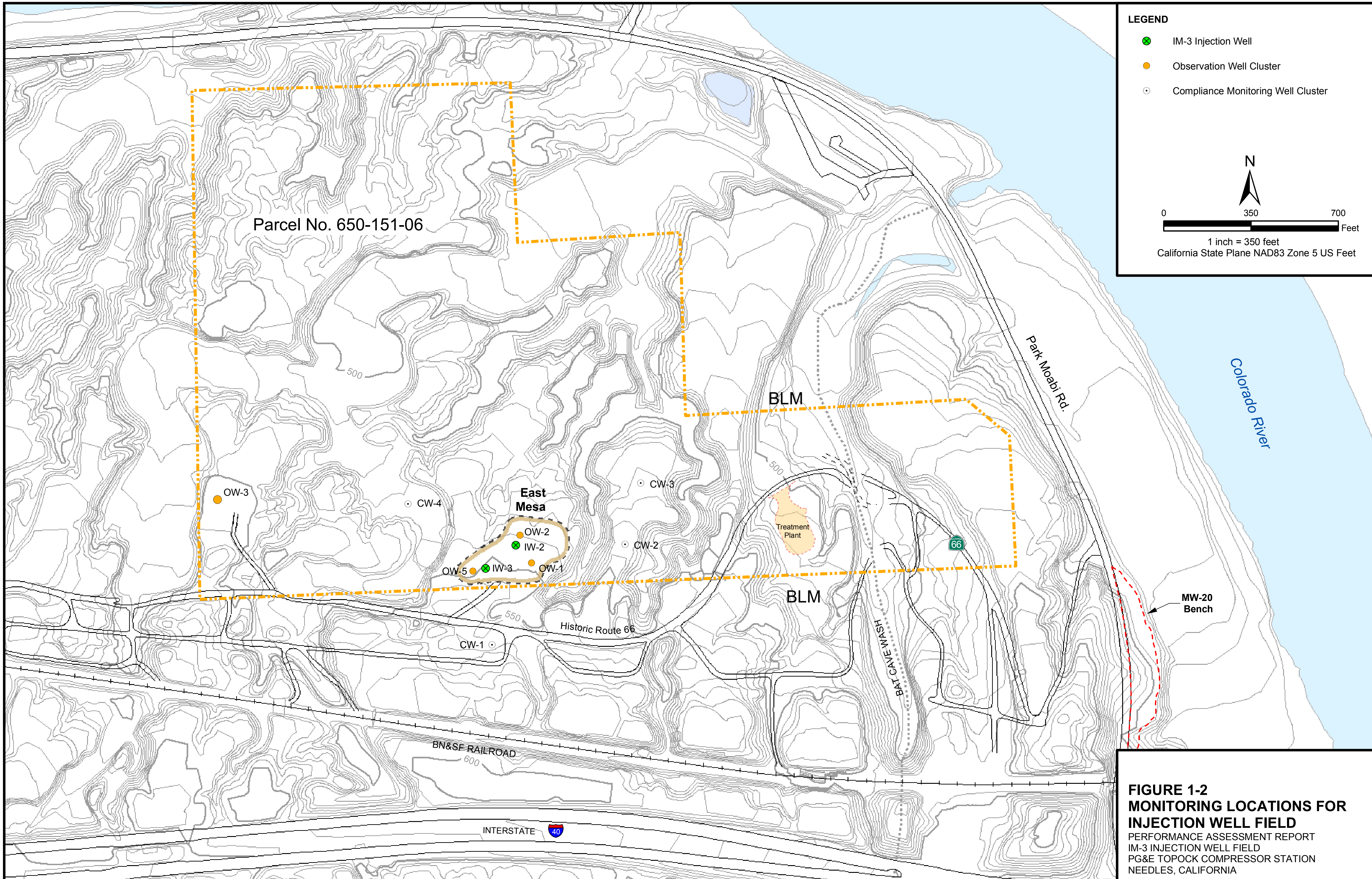

FIGURE 1-2
MONITORING LOCATIONS FOR INJECTION WELL FIELD
PERFORMANCE ASSESSMENT REPORT
IM-3 INJECTION WELL FIELD
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

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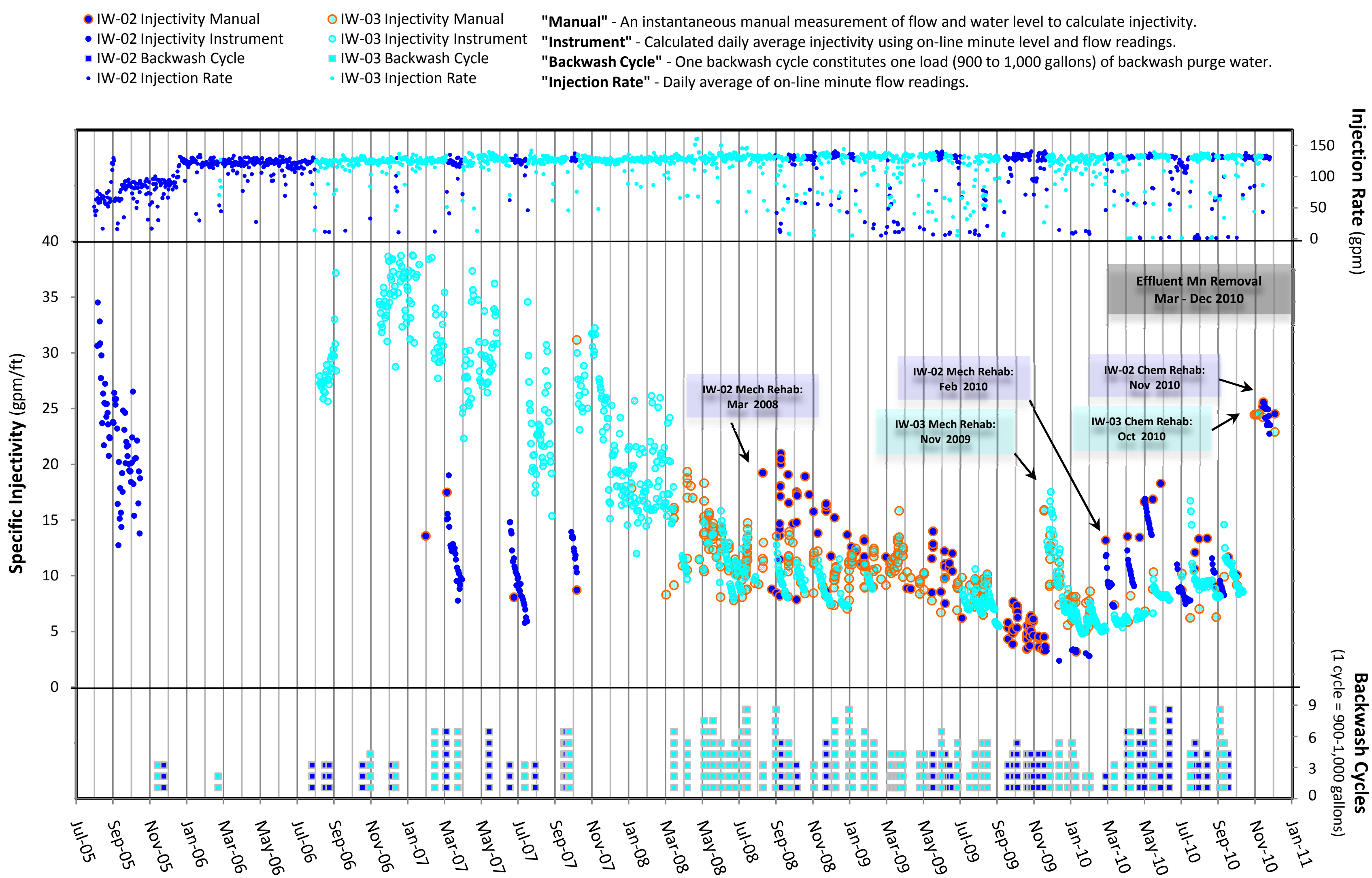

FIGURE 2-1
IM3 OPERATION DATA
INJECTION WELL PERFORMANCE
AUGUST 2005 – DECEMBER 2010

PERFORMANCE ASSESSMENT REPORT
IM-3 INJECTION WELL FIELD
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

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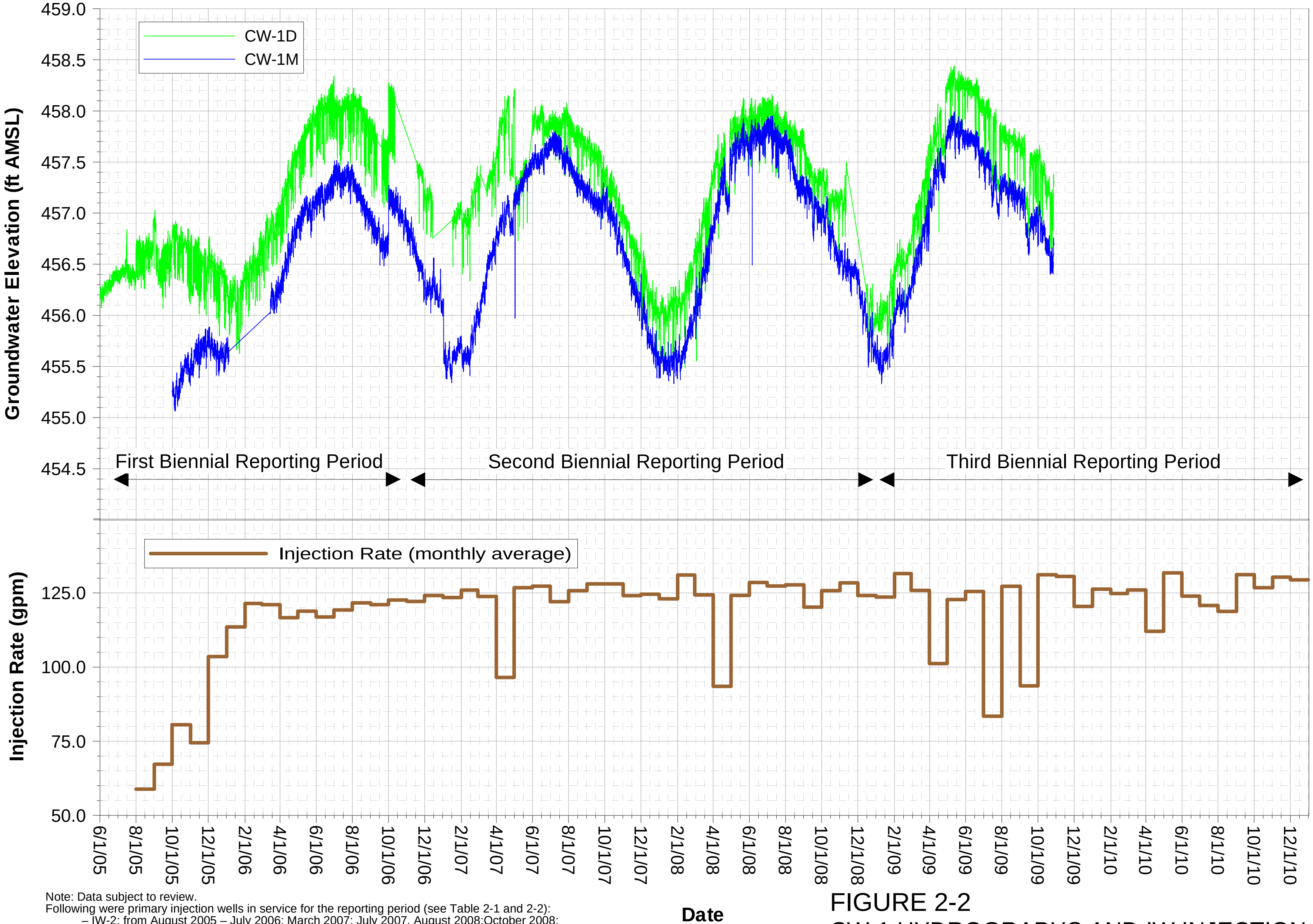
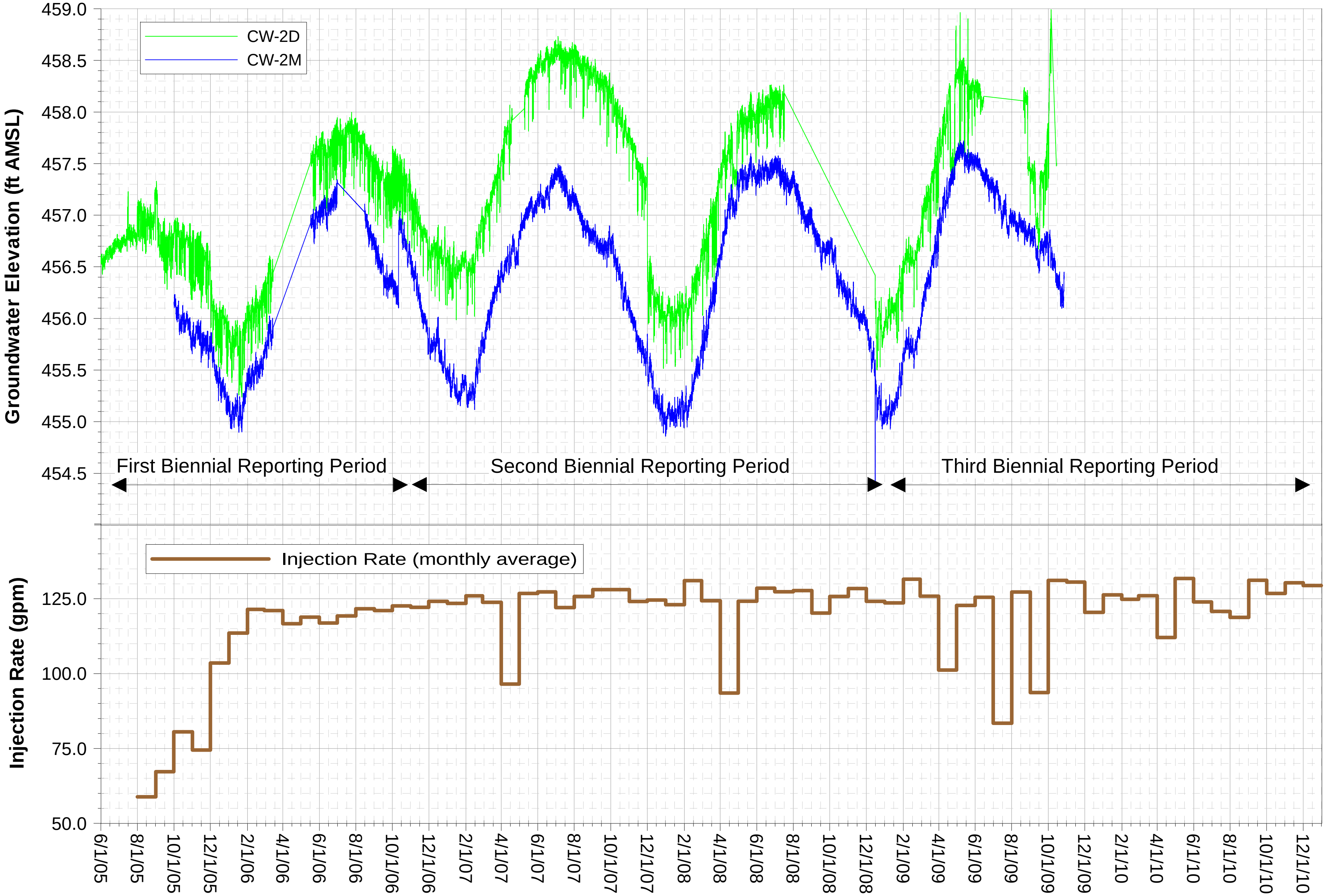


Note: Data subject to review.
Following were primary injection wells in service for the reporting period (see Table 2-1 and 2-2):
– IW-2: from August 2005 – July 2006; March 2007; July 2007, August 2008;October 2008; June 2009; from September 2009 – November 2009; July 2010; October 2010 – Present
– IW-3: from August 2006 – February 2007; from April 2007 – June 2007; from August 2007 – July 2008 September 2008; from November 2008 – May 2009; from July 2009 – August 2009; from December 2009 – June 2010; from August 2010 – September 2010

On September 3, 2009, DTSC approved modifications to the CMP Monitoring and Reporting Program that no longer required continuous groundwater elevation measurements at CW-1D and CW-1M.

FIGURE 2-2
CW-1 HYDROGRAPHS AND IW INJECTION RATE
PERFORMANCE ASSESSMENT REPORT
IM-3 INJECTION WELL FIELD
PG & E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

CH2MHILL



Note: Data subject to review.
Following were primary injection wells in service for the reporting period (see Table 2-1 and 2-2):
- IW-2: from August 2005 – July 2006; March 2007; July 2007, August 2008;October 2008; June 2009; from September 2009 – November 2009; July 2010; October 2010 – Present
- IW-3: from August 2006 – February 2007; from April 2007 – June 2007; from August 2007 – July 2008 September 2008; from November 2008 – May 2009; from July 2009 – August 2009; from December 2009 – June 2010; from August 2010 – September 2010

On September 3, 2009, DTSC approved modifications to the CMP Monitoring and Reporting Program that no longer required continuous groundwater elevation measurements at CW-2D and CW-2M.

FIGURE 2-3
CW-2 HYDROGRAPHS AND IW INJECTION RATE
PERFORMANCE ASSESSMENT REPORT
IM-3 INJECTION WELL FIELD
PG & E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

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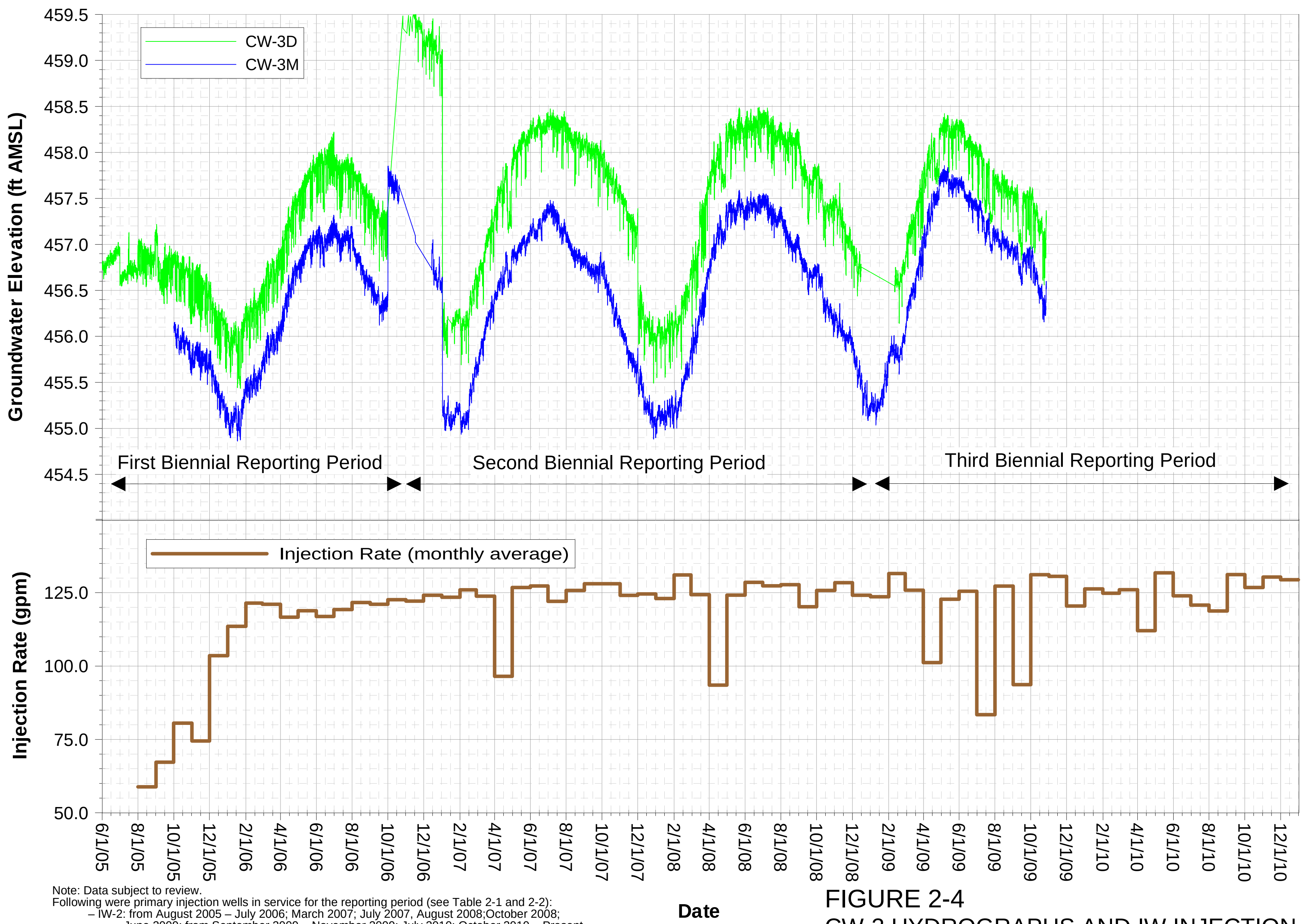

Note: Data subject to review.
Following were primary injection wells in service for the reporting period (see Table 2-1 and 2-2):
– IW-2: from August 2005 – July 2006; March 2007; July 2007, August 2008;October 2008; June 2009; from September 2009 – November 2009; July 2010; October 2010 – Present
– IW-3: from August 2006 – February 2007; from April 2007 – June 2007; from August 2007 – July 2008 September 2008; from November 2008 – May 2009; from July 2009 – August 2009; from December 2009 – June 2010; from August 2010 – September 2010

On September 3, 2009, DTSC approved modifications to the CMP Monitoring and Reporting Program that no longer required continuous groundwater elevation measurements at CW-3D and CW-3M.

FIGURE 2-4
CW-3 HYDROGRAPHS AND IW INJECTION RATE
PERFORMANCE ASSESSMENT REPORT
IM-3 INJECTION WELL FIELD
PG & E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

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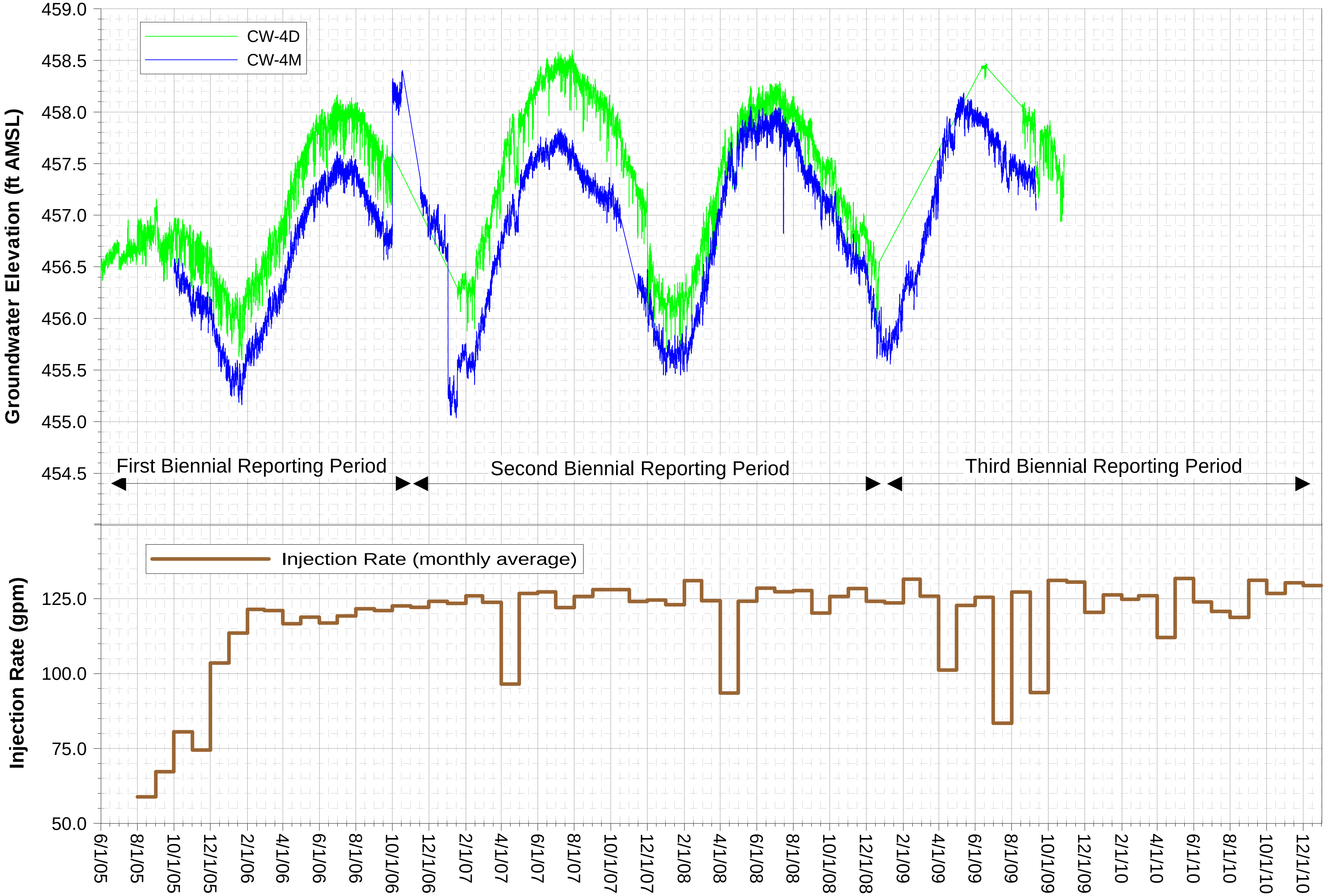

Note: Data subject to review.
Following were primary injection wells in service for the reporting period (see Table 2-1 and 2-2):
– IW-2: from August 2005 – July 2006; March 2007; July 2007, August 2008;October 2008; June 2009; from September 2009 – November 2009; July 2010; October 2010 – Present
– IW-3: from August 2006 – February 2007; from April 2007 – June 2007; from August 2007 – July 2008 September 2008; from November 2008 – May 2009; from July 2009 – August 2009; from December 2009 – June 2010; from August 2010 – September 2010

On September 3, 2009, DTSC approved modifications to the CMP Monitoring and Reporting Program that no longer required continuous groundwater elevation measurements at CW-4D and CW-4M.

FIGURE 2-5
CW-4 HYDROGRAPHS AND IW INJECTION RATE
PERFORMANCE ASSESSMENT REPORT
IM-3 INJECTION WELL FIELD
PG & E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

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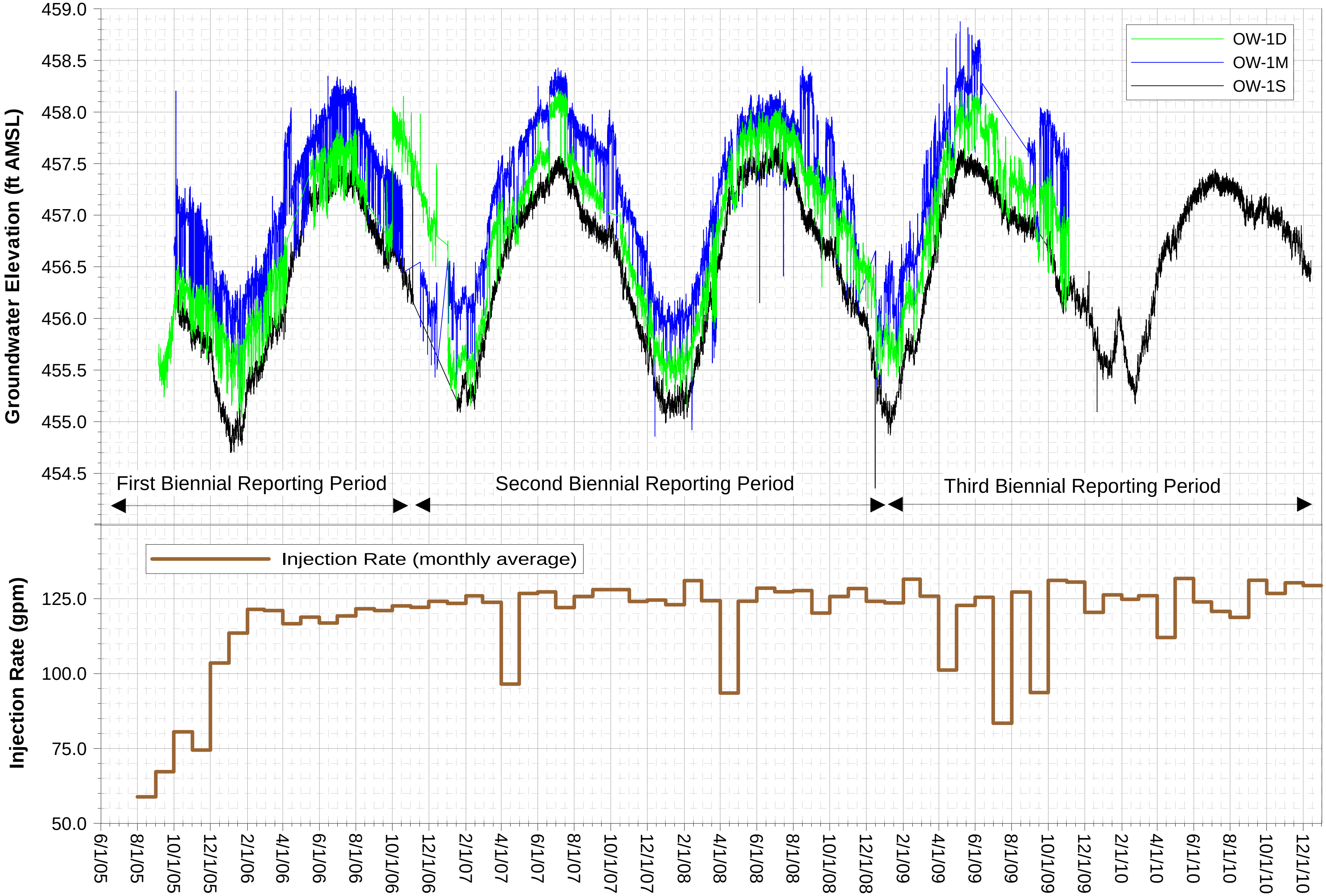

Note: Data subject to review.
Following were primary injection wells in service for the reporting period (see Table 2-1 and 2-2):
– IW-2: from August 2005 – July 2006; March 2007; July 2007, August 2008;October 2008; June 2009; from September 2009 – November 2009; July 2010; October 2010 – Present
– IW-3: from August 2006 – February 2007; from April 2007 – June 2007; from August 2007 – July 2008 September 2008; from November 2008 – May 2009; from July 2009 – August 2009; from December 2009 – June 2010; from August 2010 – September 2010

On September 3, 2009, DTSC approved modifications to the CMP Monitoring and Reporting Program that no longer required continuous groundwater elevation measurements at OW-1D and OW-1M.

FIGURE 2-6
OW-1 HYDROGRAPHS AND IW INJECTION RATE
PERFORMANCE ASSESSMENT REPORT
IM-3 INJECTION WELL FIELD
PG & E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

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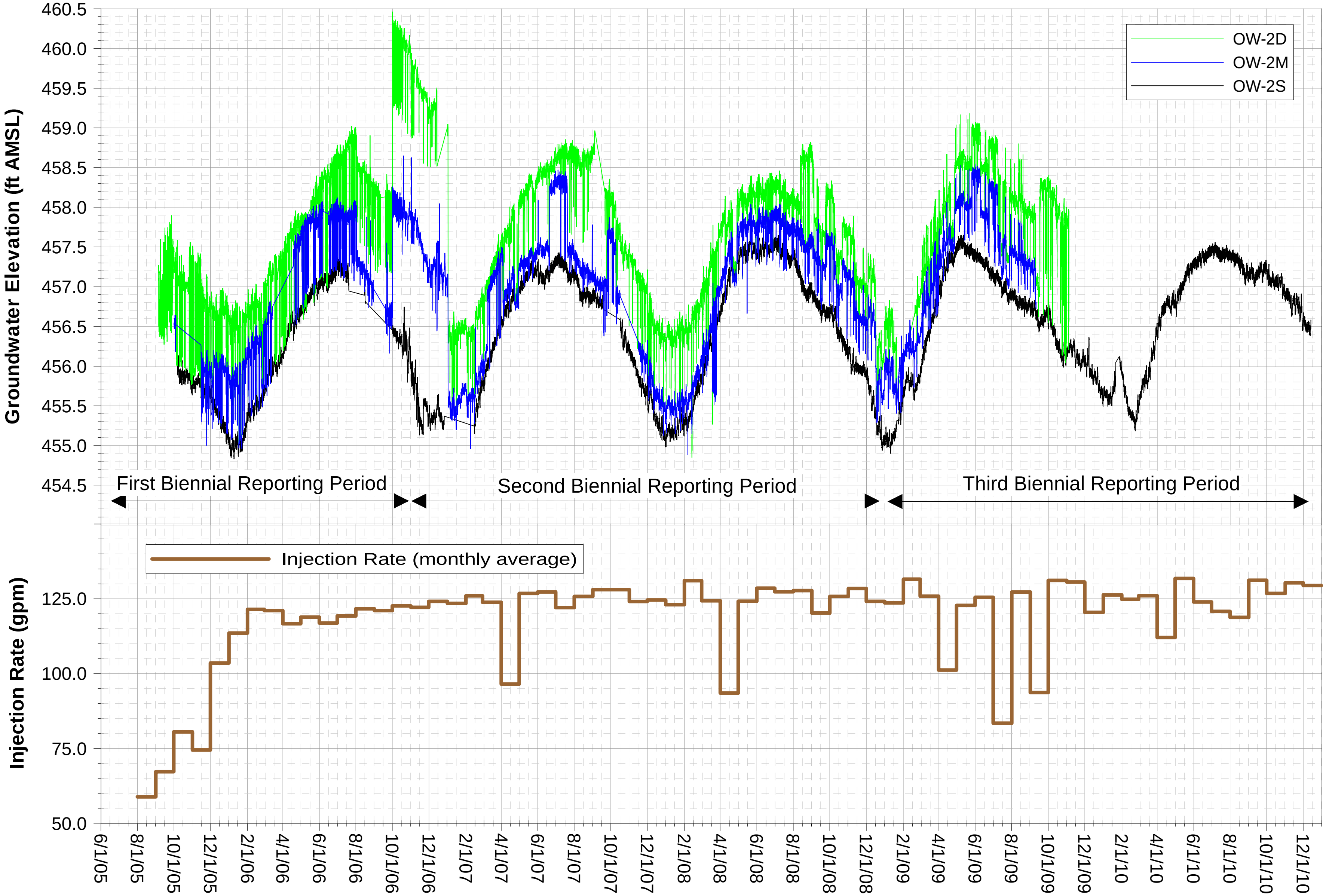

Note: Data subject to review.
Following were primary injection wells in service for the reporting period (see Table 2-1 and 2-2):
– IW-2: from August 2005 – July 2006; March 2007; July 2007, August 2008;October 2008; June 2009; from September 2009 – November 2009; July 2010; October 2010 – Present
– IW-3: from August 2006 – February 2007; from April 2007 – June 2007; from August 2007 – July 2008 September 2008; from November 2008 – May 2009; from July 2009 – August 2009; from December 2009 – June 2010; from August 2010 – September 2010

On September 3, 2009, DTSC approved modifications to the CMP Monitoring and Reporting Program that no longer required continuous groundwater elevation measurements at OW-2D and OW-2M.

FIGURE 2-7
OW-2 HYDROGRAPHS AND IW INJECTION RATE
PERFORMANCE ASSESSMENT REPORT
IM-3 INJECTION WELL FIELD
PG & E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

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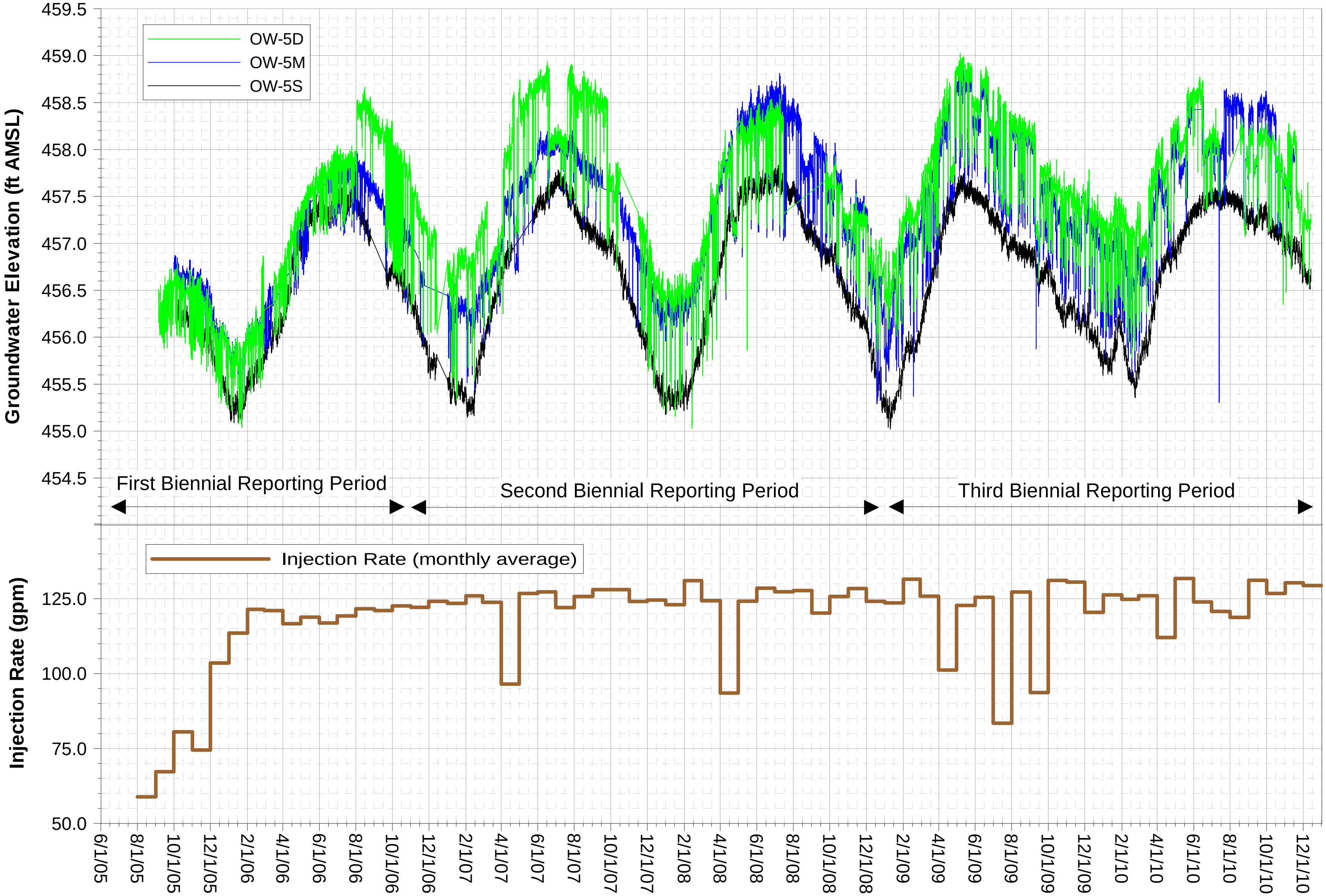

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Following were primary injection wells in service for the reporting period (see Table 2-1 and 2-2):
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– IW-3: from August 2006 – February 2007; from April 2007 – June 2007; from August 2007 – July 2008 September 2008; from November 2008 – May 2009; from July 2009 – August 2009; from December 2009 – June 2010; from August 2010 – September 2010

FIGURE 2-8
OW-5 HYDROGRAPHS AND IW INJECTION RATE
PERFORMANCE ASSESSMENT REPORT
IM-3 INJECTION WELL FIELD
PG & E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

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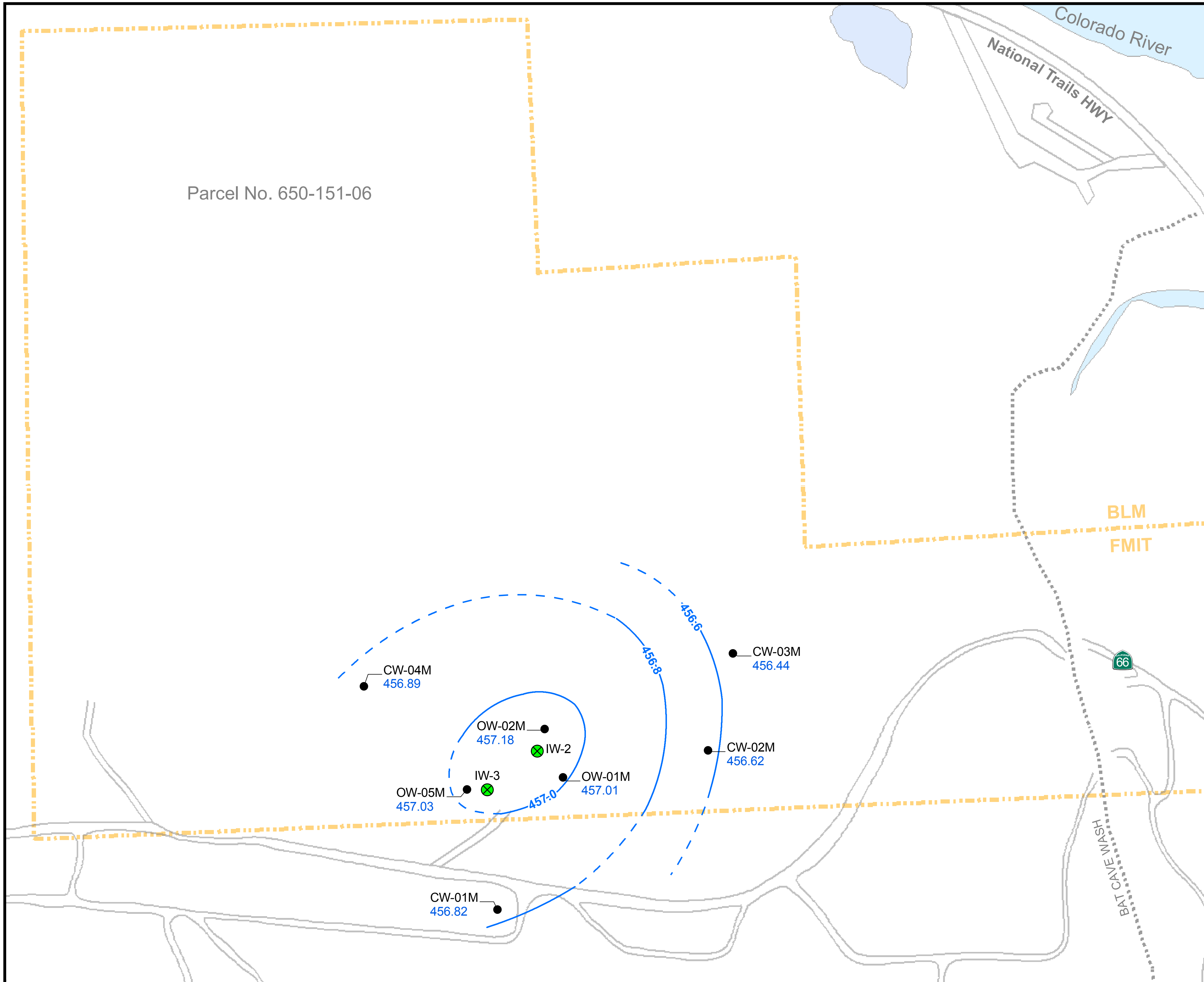

LEGEND

IM-3 Injection Well

Groundwater Monitoring, Compliance, and Observation Well

Groundwater Elevations for Mid-Depth Wells in IM-3 Injection Area

OW-05M
457.03 Salinity and temperature adjusted groundwater head elevation in feet above mean sea level (MSL)

Groundwater elevation contour in feet above MSL (0.2 foot interval), dashed where inferred

N

0 250 500 Feet

1 inch = 250 feet

California State Plane NAD83 Zone 5 US Feet

FIGURE 2-9
AVERAGE GROUNDWATER ELEVATION CONTOURS FOR MID-DEPTH WELLS
NOVEMBER 29, 2010

PERFORMANCE ASSESSMENT REPORT
IM-3 INJECTION WELL FIELD
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

\\ZINFANDEL\PROJ\PACIFICGASELECTRICCO\TOPOCKPROGRAM\GIS\MAPFILES\2011\IM3\IM3_GWE_2010NOV_MID.MXD JLAMANTI 1/12/2011 10:05:30

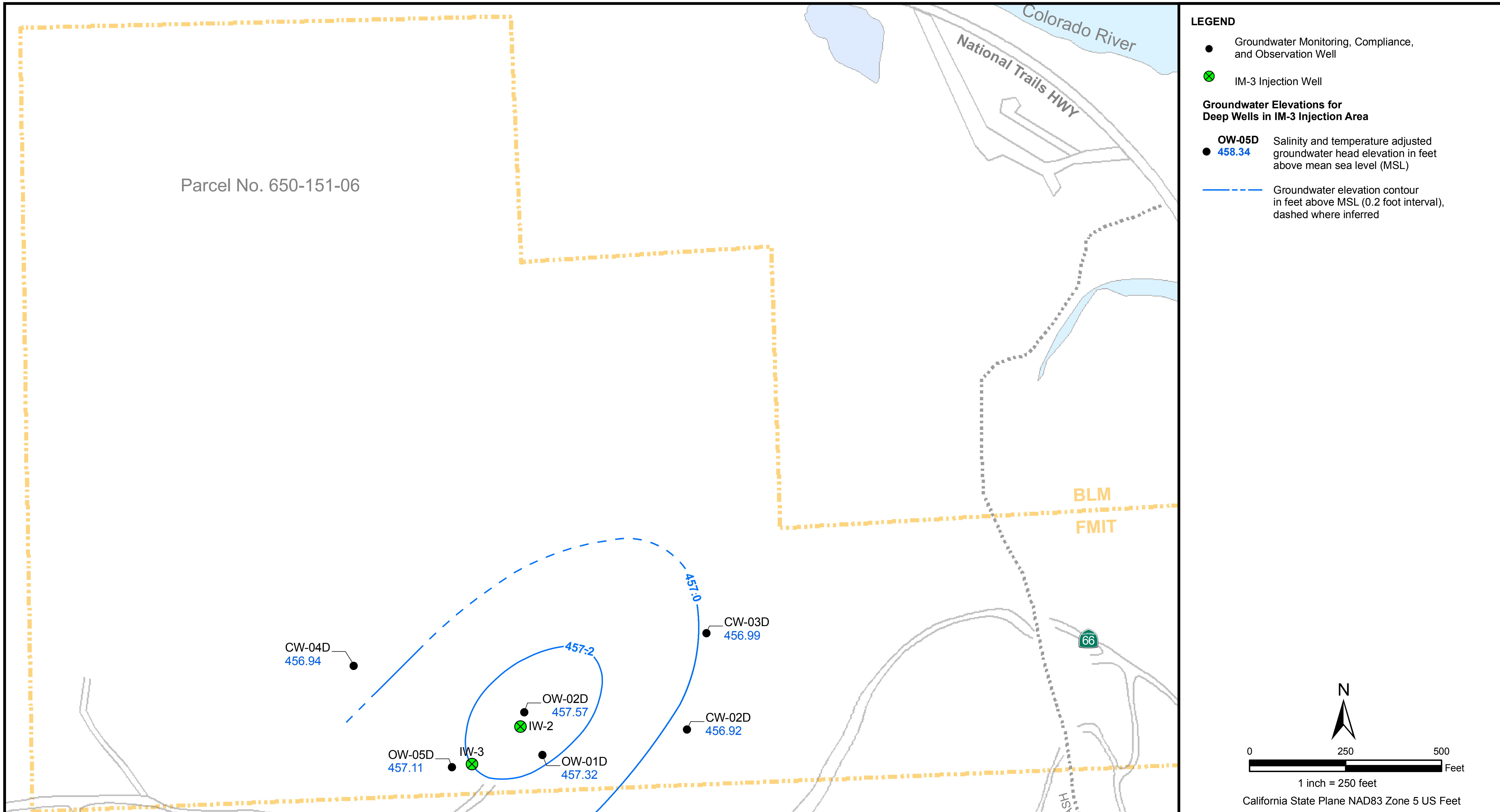

FIGURE 2-10
AVERAGE GROUNDWATER ELEVATION CONTOURS FOR DEEP WELLS
NOVEMBER 29, 2010

PERFORMANCE ASSESSMENT REPORT
IM-3 INJECTION WELL FIELD
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

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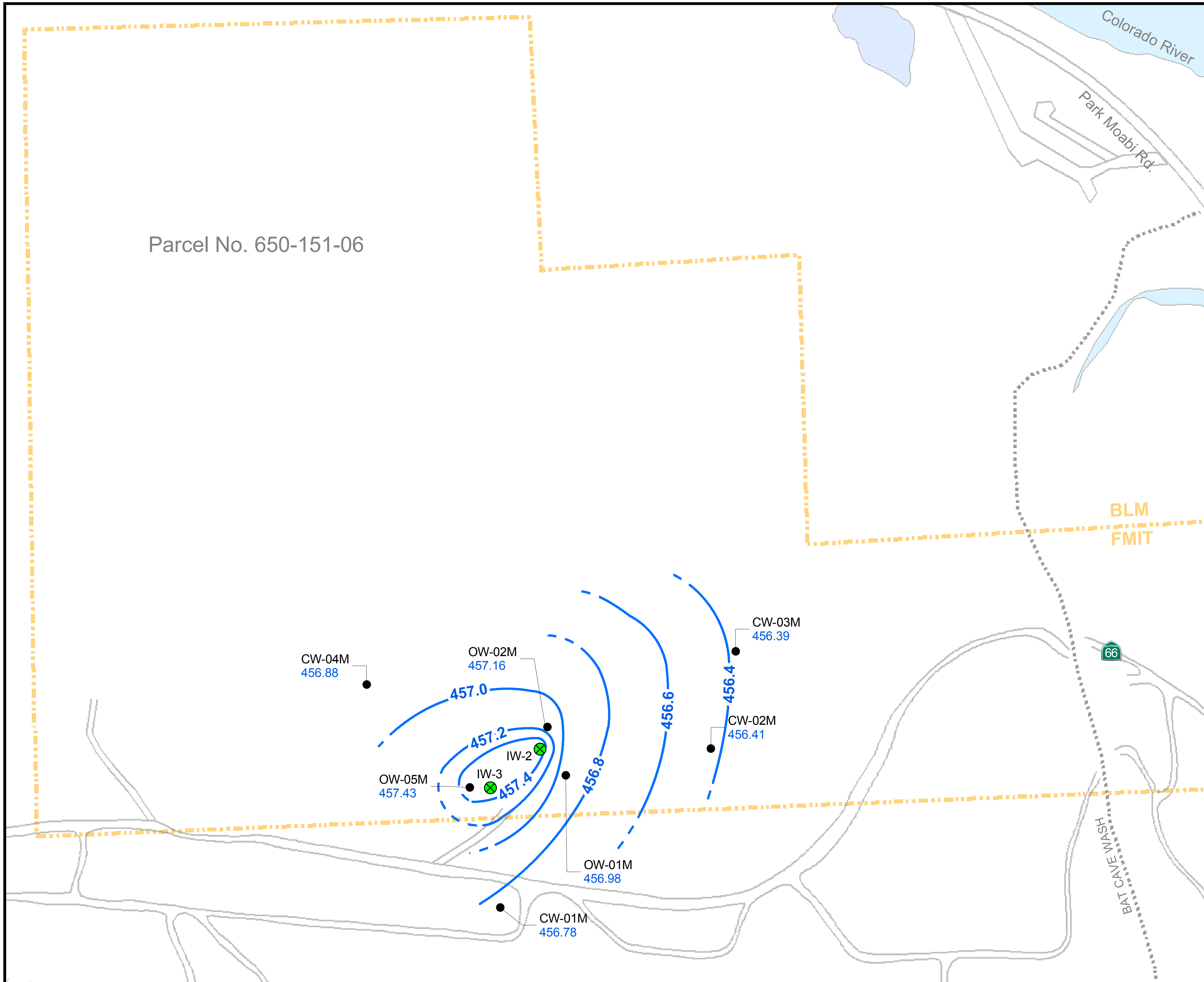

LEGEND

IM-3 Injection Well

Groundwater Monitoring, Compliance, and Observation Well

Groundwater Elevations for Mid-depth Wells in IM-3 Injection Area

OW-02M 457.16 — Salinity and temperature adjusted groundwater head elevation in feet above mean sea level (MSL)

Groundwater elevation contour in feet above MSL (0.2 foot interval), dashed where inferred

Note:
Data posted and contoured from monthly average heads measured with transducers at 30 minute intervals.

N

0 250 500 Feet

1 inch = 250 feet

California State Plane NAD83 Zone 5 US Feet

FIGURE 2-11
AVERAGE GROUNDWATER ELEVATION CONTOURS FOR MID-DEPTH WELLS OCTOBER 1 TO OCTOBER 31, 2008

PERFORMANCE ASSESSMENT REPORT
IM-3 INJECTION WELL FIELD
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

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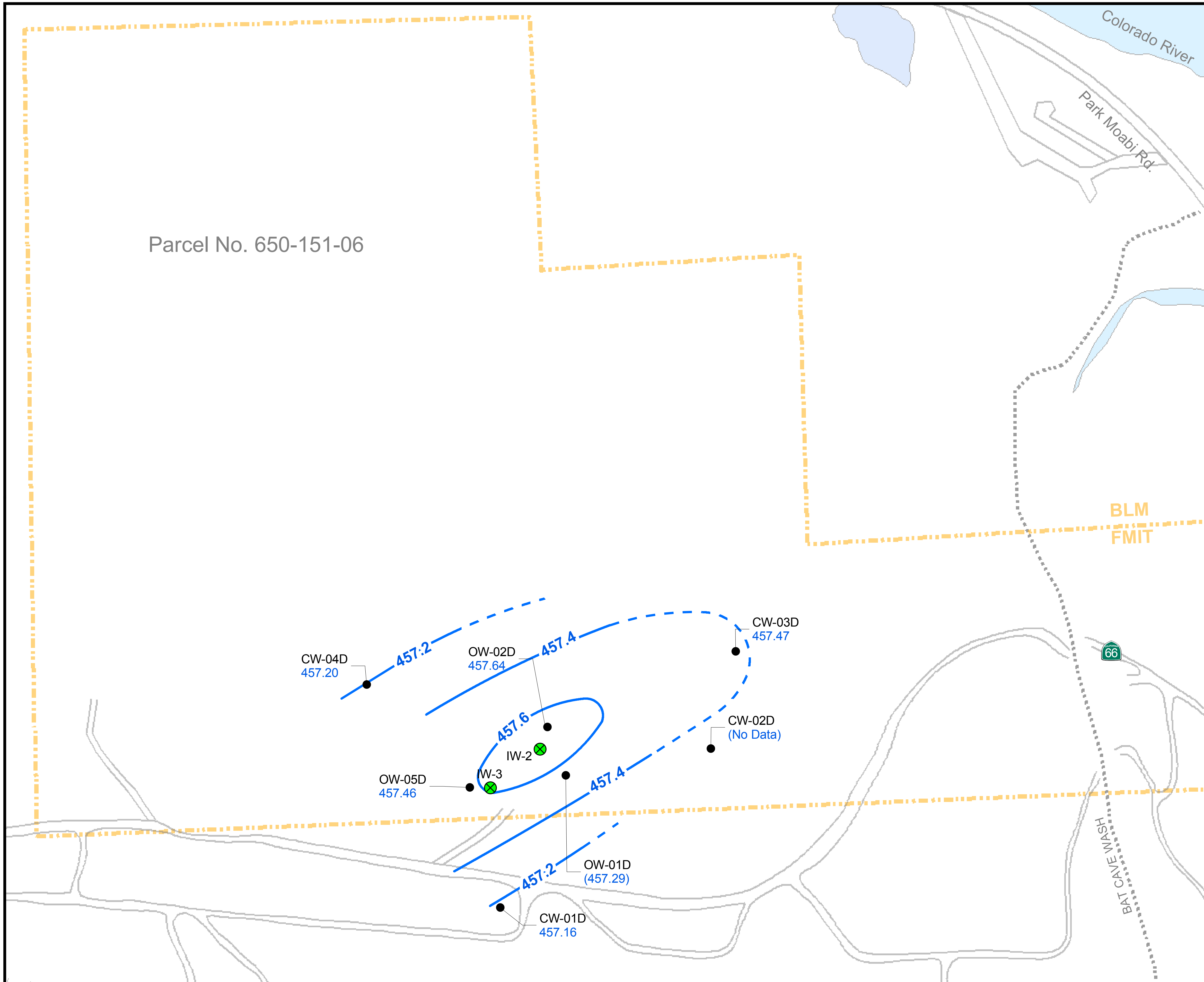

LEGEND

IM-3 Injection Well

Groundwater Monitoring, Compliance, and Observation Well

Groundwater Elevations for Deep Wells in IM-3 Injection Area

OW-02M 457.16 — Salinity and temperature adjusted groundwater head elevation in feet above mean sea level (MSL)

Groundwater elevation contour in feet above MSL (0.2 foot interval), dashed where inferred

Notes:
Data posted and contoured from monthly average heads measured with transducers at 30 minute intervals.
(OW-01D) excluded from contouring.
(CW-02D) transducer failed.

N

0 250 500 Feet

1 inch = 250 feet

California State Plane NAD83 Zone 5 US Feet

FIGURE 2-12
AVERAGE GROUNDWATER ELEVATION CONTOURS FOR DEEP WELLS OCTOBER 1 TO OCTOBER 31, 2008
PERFORMANCE ASSESSMENT REPORT
IM-3 INJECTION WELL FIELD
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

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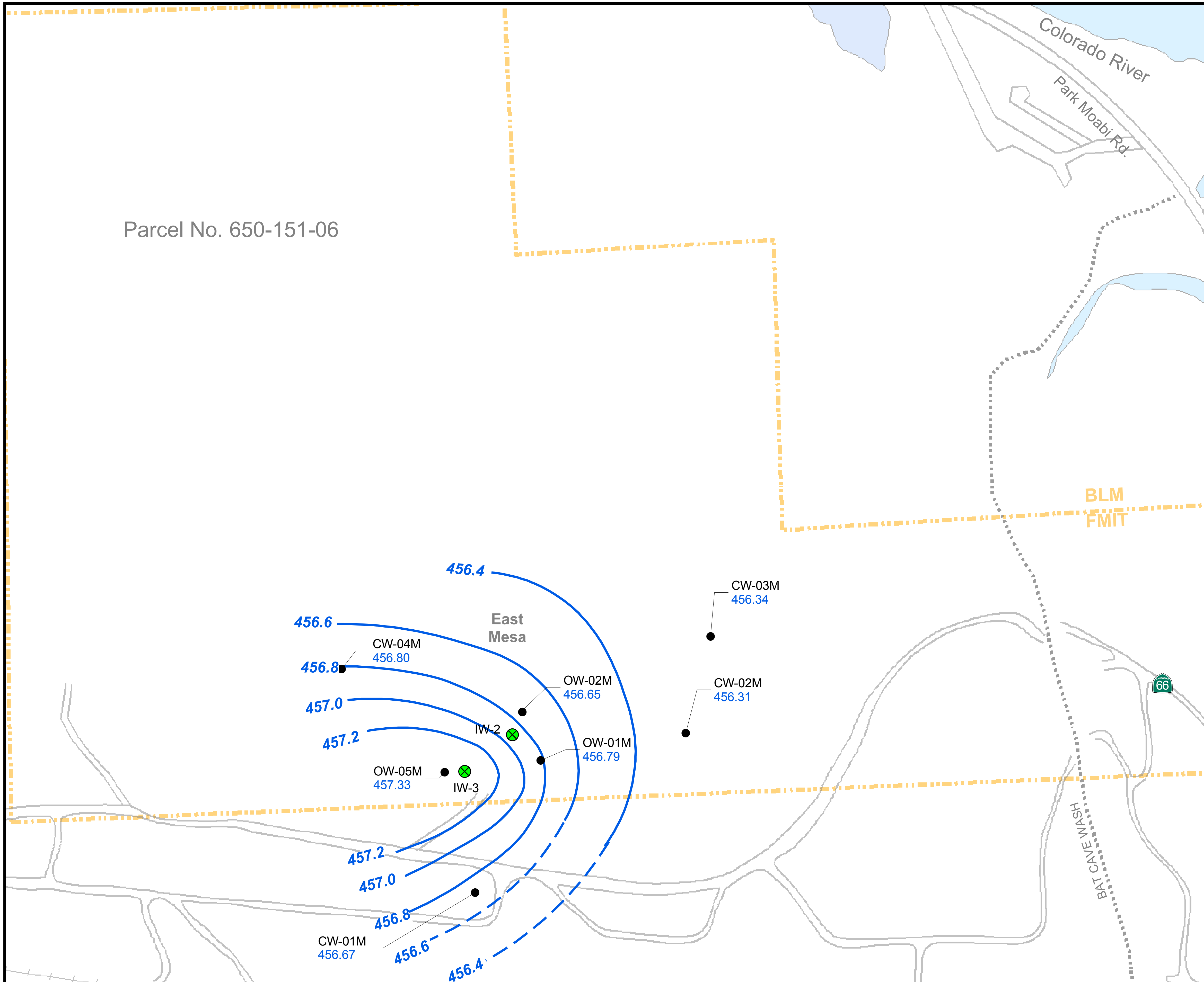

LEGEND

IM-3 Injection Well

Groundwater Monitoring, Compliance, and Observation Well

Groundwater Elevations for Mid-depth Wells in IM-3 Injection Area

OW-02M 454.75 — Salinity and temperature adjusted groundwater head elevation in feet above mean sea level (MSL)

Groundwater elevation contour in feet above MSL (0.2 foot interval), dashed where inferred

Note: Average monthly groundwater elevations are calculated with pressure transducer data measured at 30 minute intervals. OW-5M is the average of data from 9/15/2006 through 9/23/2006.

N

0 250 500 Feet

1 inch = 250 feet

California State Plane NAD83 Zone 5 US Feet

FIGURE 2-13
AVERAGE GROUNDWATER ELEVATION CONTOURS FOR MID-DEPTH WELLS SEPTEMBER 15 TO OCTOBER 15, 2006

PERFORMANCE ASSESSMENT REPORT
IM-3 INJECTION WELL FIELD
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

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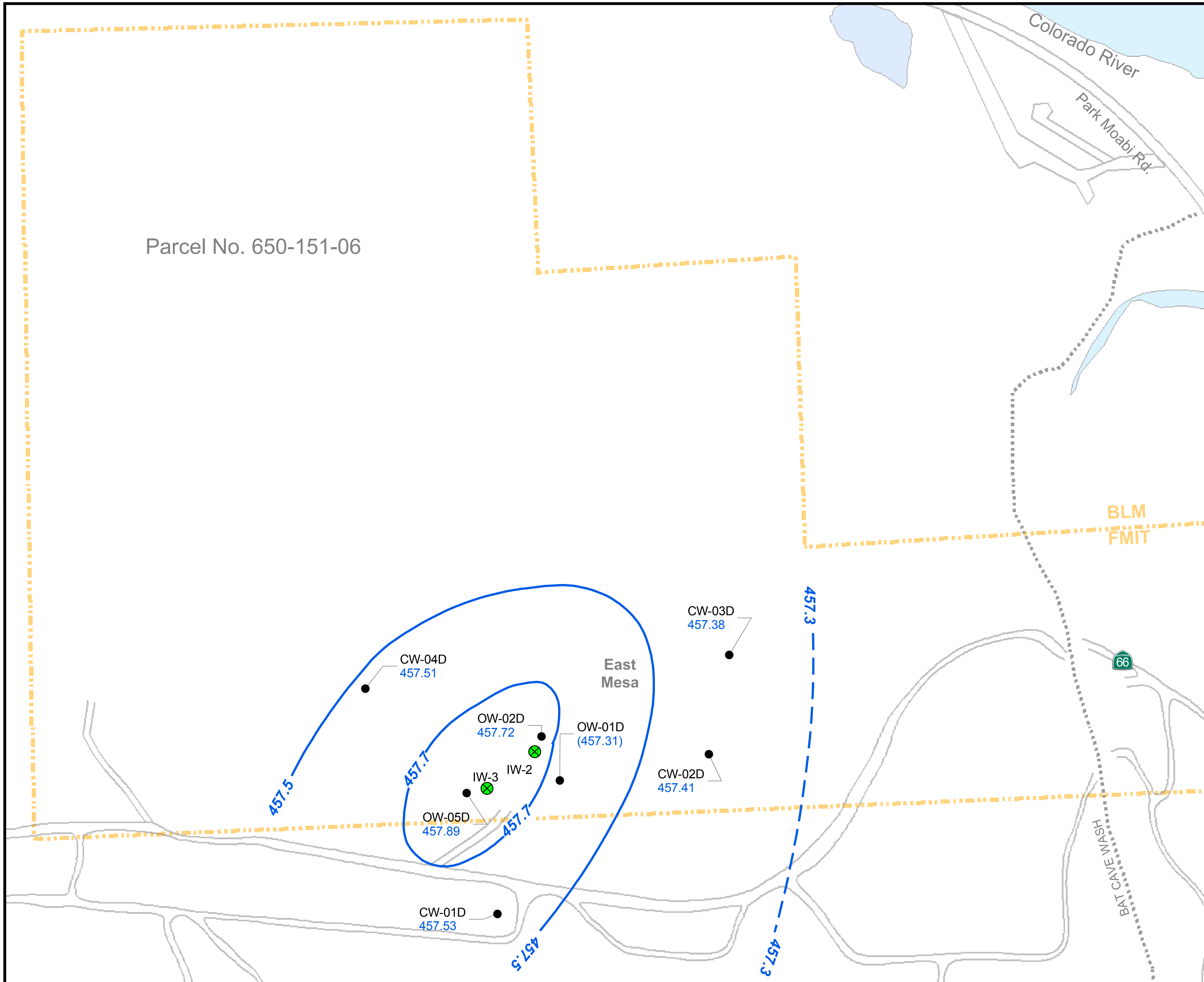

LEGEND

IM-3 Injection Well

Groundwater Monitoring, Compliance, and Observation Well

Groundwater Elevations for Deep Wells in IM-3 Injection Area

OW-05D **454.75** Salinity and temperature adjusted groundwater head elevation in feet above mean sea level (MSL)

Groundwater elevation contour in feet above MSL (0.2 foot interval), dashed where inferred

Notes:
Data posted and contoured from monthly average heads measured with tranducers at 30 minute intervals. (OW-1D) excluded from contouring.

N

0 250 500 Feet

1 inch = 250 feet

California State Plane NAD83 Zone 5 US Feet

FIGURE 2-14
AVERAGE GROUNDWATER ELEVATION CONTOURS FOR DEEP WELLS SEPTEMBER 15 TO OCTOBER 15, 2006
PERFORMANCE ASSESSMENT REPORT
IM-3 INJECTION WELL FIELD
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

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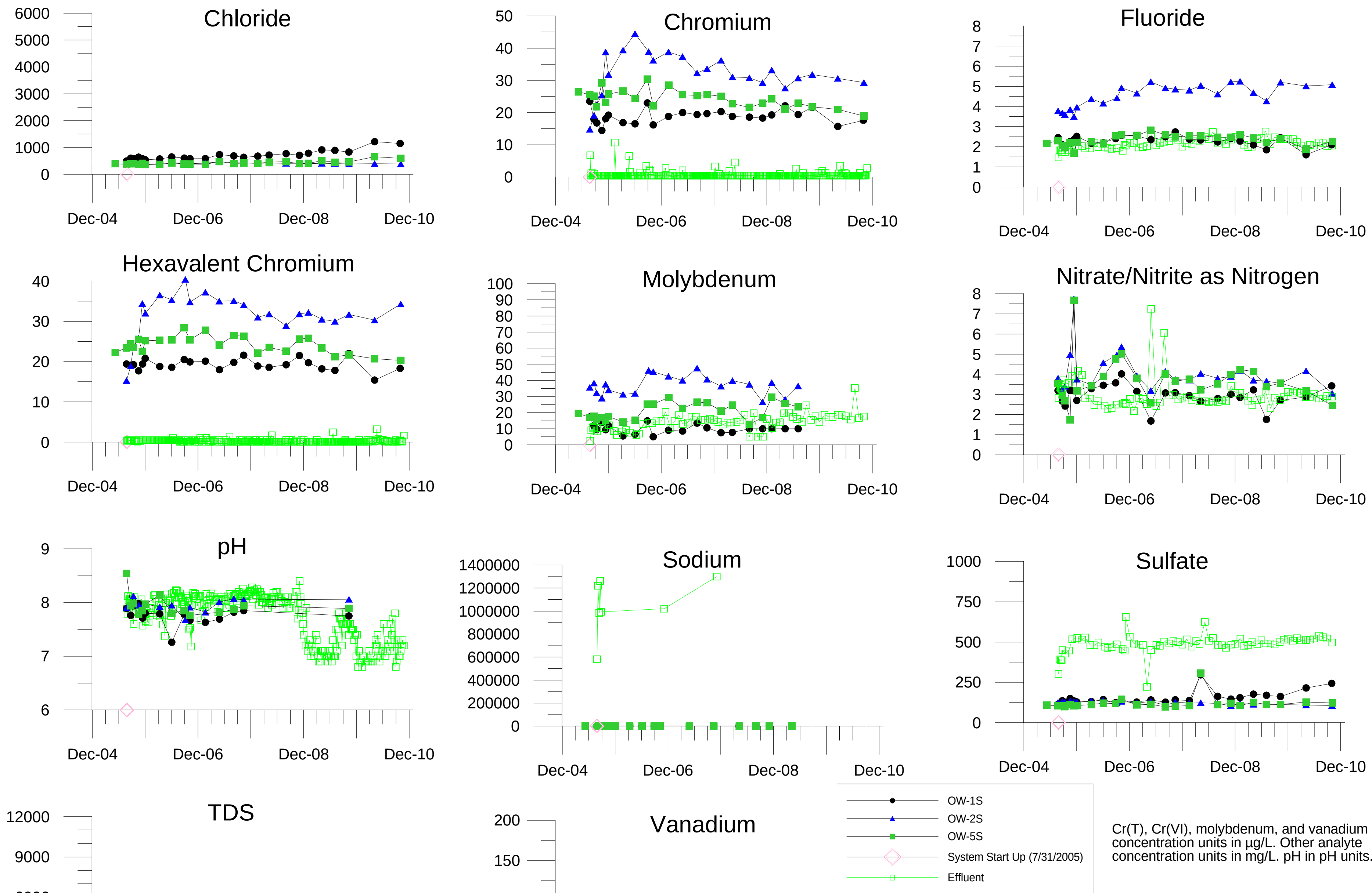


FIGURE 3-1
OW-1S, OW-2S, OW-5S
WATER QUALITY HYDROGRAPHS
PERFORMANCE ASSESSMENT REPORT
IM-3 INJECTION WELL FIELD
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

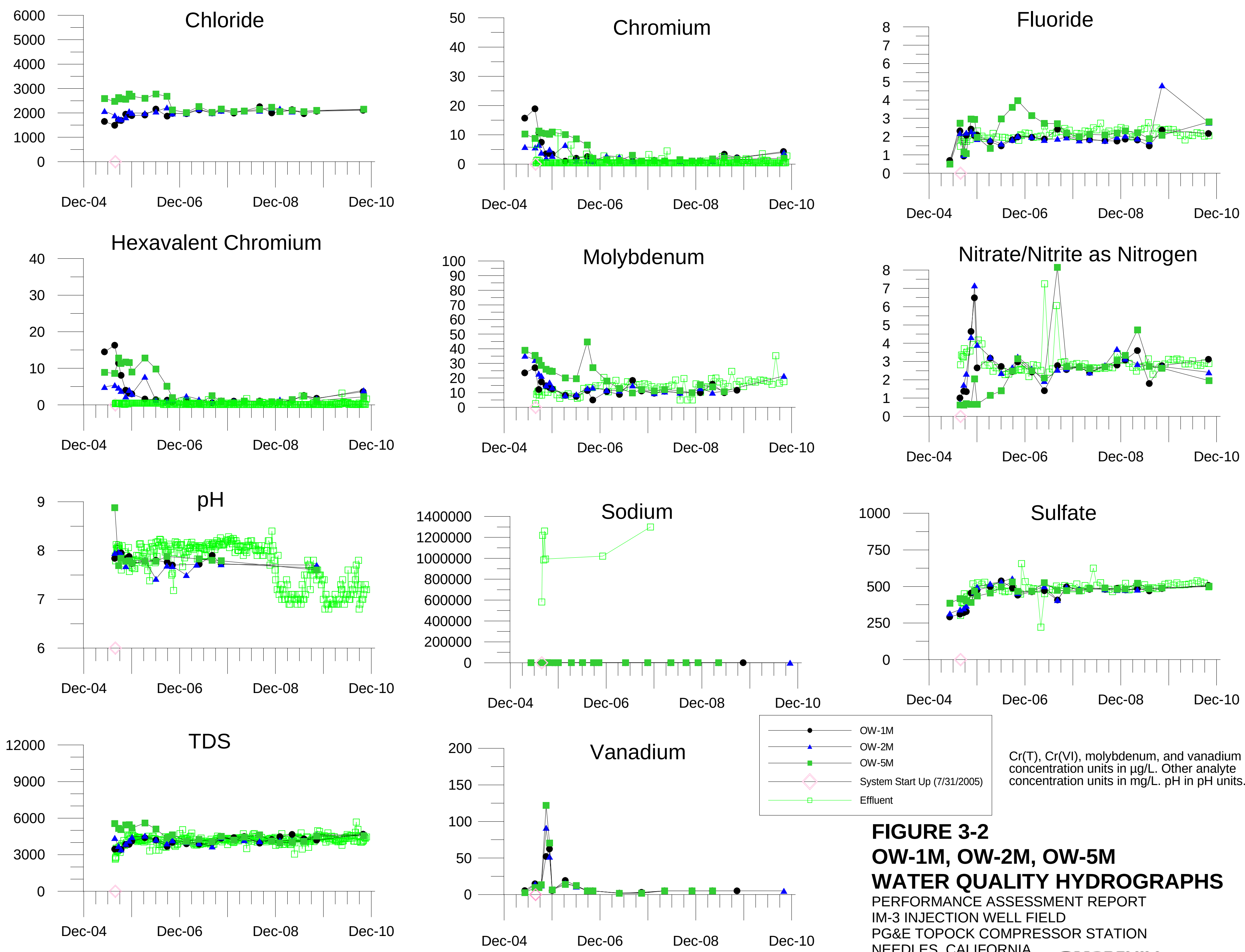


FIGURE 3-2
OW-1M, OW-2M, OW-5M
WATER QUALITY HYDROGRAPHS
PERFORMANCE ASSESSMENT REPORT
IM-3 INJECTION WELL FIELD
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

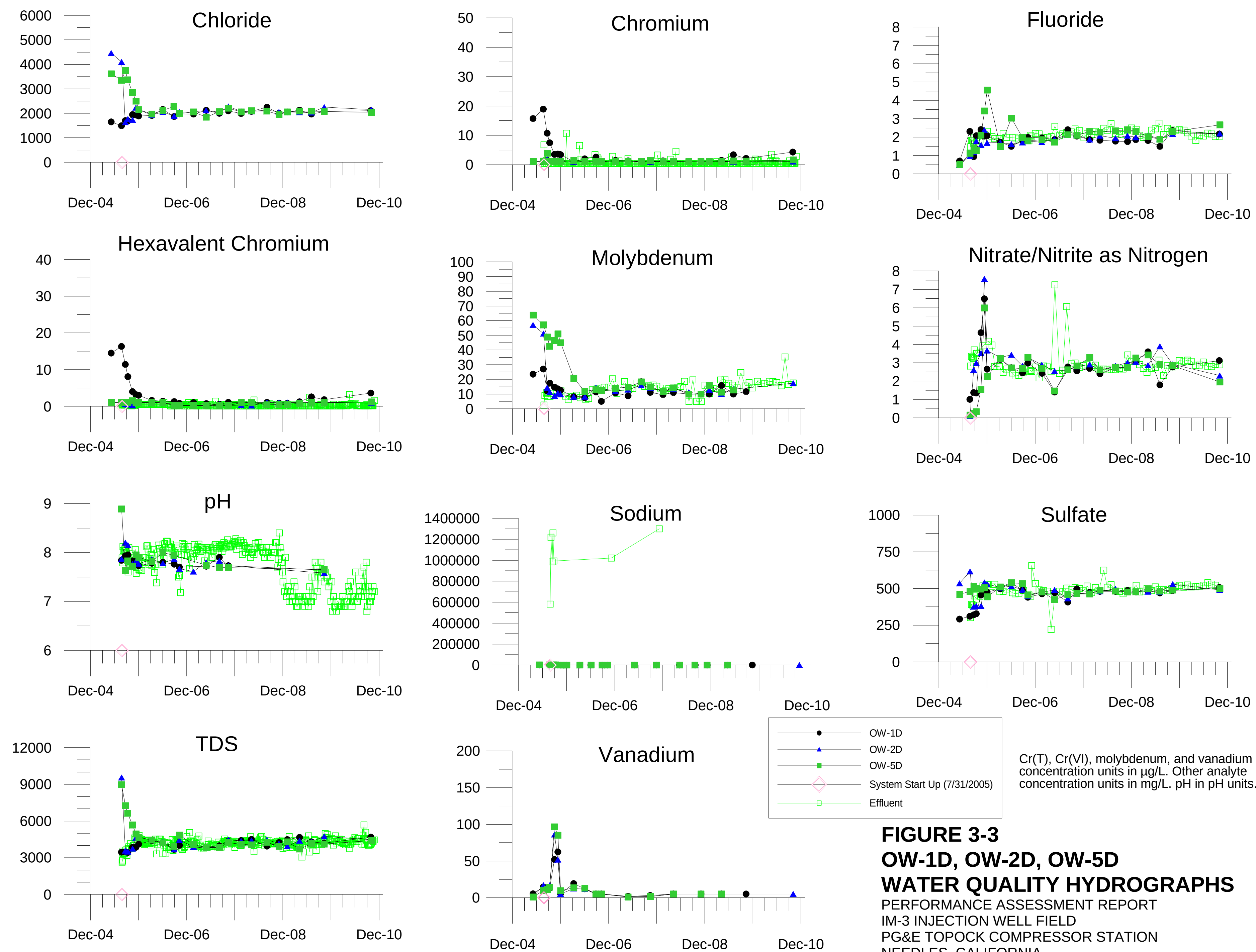
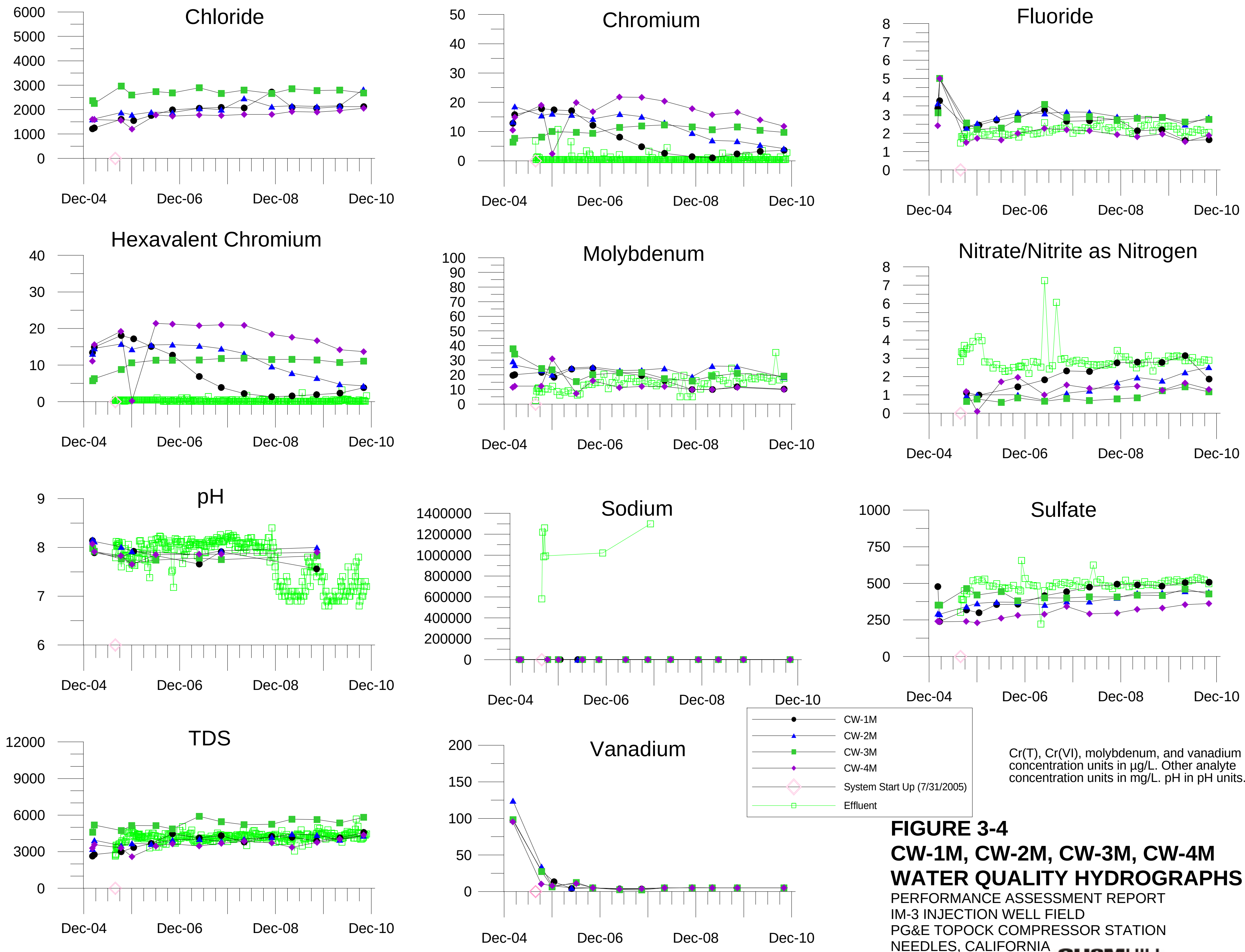


FIGURE 3-3
OW-1D, OW-2D, OW-5D
WATER QUALITY HYDROGRAPHS
PERFORMANCE ASSESSMENT REPORT
IM-3 INJECTION WELL FIELD
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL



Cr(T), Cr(VI), molybdenum, and vanadium concentration units in µg/L. Other analyte concentration units in mg/L. pH in pH units.

FIGURE 3-4
CW-1M, CW-2M, CW-3M, CW-4M WATER QUALITY HYDROGRAPHS
PERFORMANCE ASSESSMENT REPORT
IM-3 INJECTION WELL FIELD
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

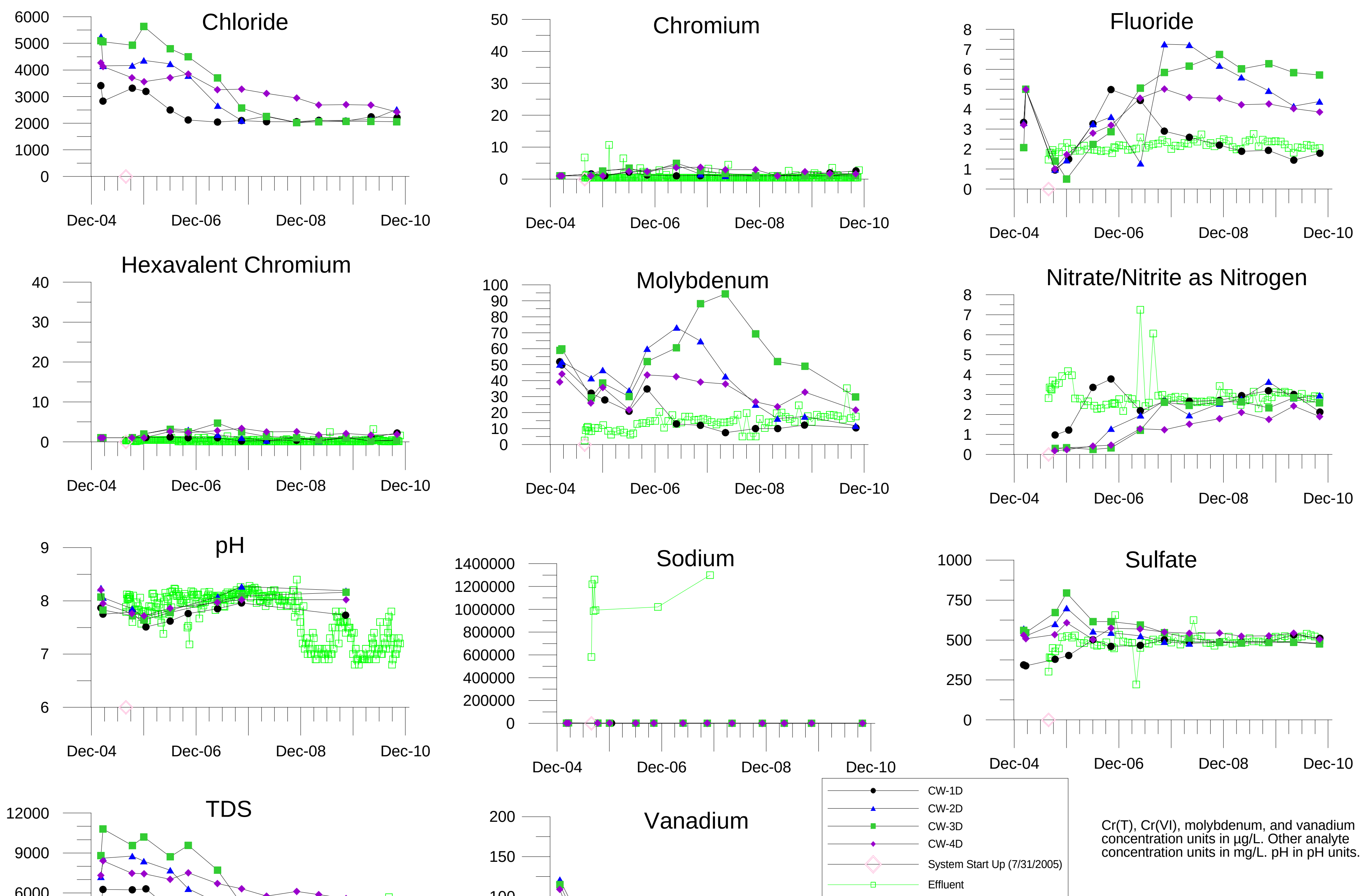


FIGURE 3-5
CW-1D, CW-2D, CW-3D, CW-4D WATER QUALITY HYDROGRAPHS
PERFORMANCE ASSESSMENT REPORT
IM-3 INJECTION WELL FIELD
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

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Appendix A
Semiannual Groundwater Monitoring Report, Second Half 2010 for the Interim Measure Compliance Monitoring Program at the PG&E Topock Compressor Station

Topock Project Executive Abstract

Document Title: Compliance Monitoring Program, Semiannual Groundwater Monitoring Report, Second Half 2010 Submitting Agency: DTSC, RWQCB Final Document? ☒ Yes ☐ No	Date of Document: January 14, 2011 Who Created this Document?: (i.e. PG&E, DTSC, DOI, Other) – PG&E
Priority Status: ☐ **HIGH** ☐ **MED** ☒ **LOW** Is this time critical? ☐ Yes ☒ No Type of Document: ☐ Draft ☒ Report ☐ Letter ☐ Memo ☐ Other / Explain:	Action Required: ☒ Information Only ☐ Review & Comment Return to: ____________________ By Date:______________________ ☐ Other / Explain:
What does this information pertain to? ☐ Resource Conservation and Recovery Act (RCRA) Facility Assessment (RFA)/Preliminary Assessment (PA) ☐ RCRA Facility Investigation (RFI)/Remedial Investigation (RI) (including Risk Assessment) ☐ Corrective Measures Study (CMS)/Feasibility Study (FS) ☐ Corrective Measures Implementation (CMI)/Remedial Action ☐ California Environmental Quality Act (CEQA)/Environmental Impact Report (EIR) ☒ Interim Measures ☐ Other / Explain:	Is this a Regulatory Requirement? ☒ Yes ☐ No If no, why is the document needed?
What is the consequence of NOT doing this item? What is the consequence of DOING this item? Submittal of this report is a compliance requirement of DTSC directives, WDR No. R7-2006-0060, and subsequent MRP revisions.	Other Justification/s: ☐ Permit ☐ Other / Explain:

Brief Summary of attached document:

The purpose of the Topock Compliance Monitoring Program (CMP) is twofold: (1) to monitor changes in groundwater hydraulics and/or water quality of the aquifer in the injection well area and (2) to ensure that the quality of the aquifer is not adversely affected by the injected water. The monitoring network consists of multiple observation wells (OW series) and compliance wells (CW series) screened in the shallow, middle, and/or deep zones of the alluvial aquifer. The injection of treated groundwater in the area began in 2005. As of the Second Half 2010, wells that exhibit water quality similar to the injected water include the middle and deep zone observation wells and certain middle and all deep zone compliance wells. The shallow zone observation wells have not yet shown the injected water quality.

This report presents analytical groundwater laboratory results and groundwater level data collected from the Second Half 2010 CMP monitoring event conducted in October 2010. During the Second Half 2010 monitoring event, the groundwater samples from the shallow observation well OW-2S had hexavalent chromium (Cr[VI]) concentrations of 34.3 micrograms per liter (µg/L) and chromium concentrations of 29.3 µg/L. These results exceeded the Cr(VI) and chromium water quality objectives of 32.6 and 28 µg/L, respectively. The concentrations of Cr(VI) and chromium are not related to injected water (which consistently has significantly lower Cr(VI) and chromium concentrations) but instead is related to the natural variability of background water quality within the shallower portions of the groundwater aquifer. Because of this reason, DTSC and the Water Board have stated in letters to PG&E that it is not necessary to follow contingency plan requirements for Cr(VI) and chromium with respect to OW-2S and OW-5S. No other samples exceeded the water quality objectives for Cr(VI), chromium, pH, or total dissolved solids from the Second Half 2010 CMP sampling event.

Written by: PG&E

Recommendations:
This report is for your information only.

How is this information related to the Final Remedy or Regulatory Requirements:

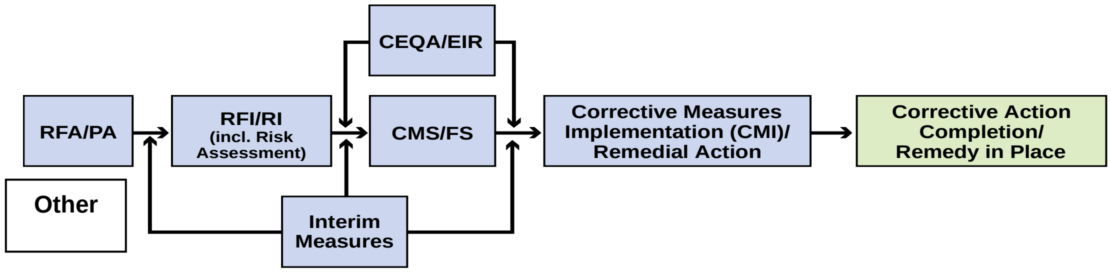
The CMP is a requirement related to the Interim Measure No. 3, designed to (1) monitor changes in groundwater hydraulics and/or water quality of the aquifer in the injection well area and (2) to ensure that the quality of the aquifer is not adversely affected by the injected water.

Other requirements of this information?

None.

Related Reports and Documents:

Click any boxes in the Regulatory Road Map (below) to be linked to the Documents Library on the DTSC Topock Web Site (www.dtsc-topock.com).



Version 9

Legend
RFA/PA – RCRA Facility Assessment/Preliminary Assessment
RFI/RI – RCRA Facility Investigation/CERCLA Remedial Investigation (including Risk Assessment)
CMS/FS – RCRA Corrective Measure Study/CERCLA Feasibility Study
CEQA/EIR – California Environmental Quality Act/Environmental Impact Report

Pacific Gas and Electric Company

Yvonne J. Meeks
Manager

Environmental Remediation
Gas Transmission & Distribution

Mailing Address
4325 South Higuera Street
San Luis Obispo, CA 93401

Location
6588 Ontario Road
San Luis Obispo, CA 93405

805.234.2257
Fax: 805.546.5232
E-mail: YJM1@pge.com

January 14, 2011

Aaron Yue
Senior Hazardous Substance Engineer
California Department of Toxic Substances Control
5796 Corporate Avenue
Cypress, California 90630

Robert Perdue
Executive Officer
California Regional Water Quality Control Board
Colorado River Basin Region
73-720 Fred Waring Drive, Suite 100
Palm Desert, California 92260

Subject: Board Order R7-2006-0060, WDID No. 7B 36 2033 001 - *Interim Measures No. 3, Compliance Monitoring Program, Semiannual Groundwater Monitoring Report, Second Half 2010, PG&E Topock Compressor Station, Needles, California*

Dear Mr. Yue and Mr. Perdue:

Enclosed is the *Compliance Monitoring Program, Semiannual Groundwater Monitoring Report, Second Half 2010* for the Interim Measure No. 3 at the Pacific Gas and Electric Company (PG&E) Topock Compressor Station. This monitoring report presents the results of the Second Half 2010 Compliance Monitoring Program (CMP) groundwater monitoring event and has been prepared in conformance with the California Regional Water Quality Board (Water Board) Order No. R7-2006-0060, MRP No. R7-2006-0060 Revision 1; the California Environmental Protection Agency, Department of Toxic Substances Control (DTSC)'s July 15, 2005 letter approving the Compliance Monitoring Plan; and subsequent letters modifying the reporting requirements.

The current contingency plan specifies the concentrations and values for hexavalent chromium (Cr[VI]), chromium, total dissolved solids (TDS), and pH to be used to determine if contingency plan actions were necessary based on sample results. The water quality objectives concentrations used to trigger the contingency plan are as follows: Cr(VI) greater than 32.6 micrograms per liter (µg/L), chromium greater than 28.0 µg/L, TDS greater than 10,800 milligrams per liter, and pH outside of the range of 6.2 to 9.2.

During the Second Half 2010 monitoring event, samples from the well OW-2S (34.3 µg/L and 29.3 µg/L) exceeded the Cr(VI) and chromium water quality objectives, respectively. A review of the water quality parameters indicative of treated groundwater injection

(Cr[VI], TDS, sulfate, molybdenum, nitrate/nitrite, and fluoride) confirm that injected water has not yet reached OW-2S and that the concentrations of Cr(VI) and chromium are not related to injected water (which consistently has significantly lower Cr(VI) and chromium concentrations than those measured at well OW-2S), but instead is related to the natural variability within the shallower portions of the aquifer.

In a letter data January 5, 2007, DTSC stated that it was not necessary to follow contingency plan requirements for Cr(VI) and chromium with respect to OW-2S and OW-5S. The Water Board concurred with this decision in a letter dated March 2, 2007. As such, the contingency plan was not triggered due to the Cr(VI) and chromium concentrations detected in OW-2S during the Second Half 2010.

No other samples exceeded the water quality objectives for Cr(VI), chromium, pH, or TDS during the Second Half 2010 sampling event. The next CMP event is scheduled to occur in April 2011.

Please contact me at (805) 546-5243 if you have any questions on the CMP.

Sincerely,

Yvonne Meeks

Yvonne Meeks
Topock Remediation Project Manager

Cc: Jose Cortez, Water Board
Christopher Guerre, DTSC

Enclosure

Final Report

Compliance Monitoring Program Semiannual Groundwater Monitoring Report, Second Half 2010

Interim Measure No. 3
PG&E Topock Compressor Station
Needles, California
Board Order R7-2006-0060
WDID No. 7B 36 2033 001

Prepared for

California Department of Toxic Substances Control and the California Regional Water Quality Control Board, Colorado River Basin Region

On behalf of

Pacific Gas and Electric Company

January 14, 2011

CH2MHILL

155 Grand Avenue, Suite 800
Oakland, CA 94612

Compliance Monitoring Program
Semiannual Groundwater Monitoring Report, Second Half 2010

PG&E Topock Compressor Station
Needles, California
Board Order R7-2006-0060, WDID No. 7B 36 2033 001

Prepared for

California Department of Toxic Substance Control and the California Regional Water Quality Control Board, Colorado River Basin Region

On behalf of

Pacific Gas and Electric Company

January 14, 2011

This report was prepared under the supervision of a
California Professional Geologist

Serena Lee
Professional Geologist, P.G. #8259

PROFESSIONAL GEOLOGIST
SERENA LEE
NO. 8259
Exp. 1/31/13
STATE OF CALIFORNIA

Contents

Tables

Figures

Appendices

Acronyms and Abbreviations

µg/L	micrograms per liter
CMP	Compliance Monitoring Program
Cr(VI)	hexavalent chromium
CW	compliance well
DTSC	California Environmental Protection Agency, Department of Toxic Substances Control
IM	Interim Measure
IM No. 3	Interim Measure No. 3
IW	injection well
mg/L	milligrams per liter
MRP	Monitoring and Reporting Program
PG&E	Pacific Gas and Electric Company
OW	observation well
QAPP	Quality Assurance Project Plan
TDS	total dissolved solids
USEPA	United States Environmental Protection Agency
Water Board	California Regional Water Quality Control Board, Colorado River Basin Region
WDR	Waste Discharge Requirements
WQO	water quality objective

1.0 Introduction

Pacific Gas and Electric Company (PG&E) is implementing an Interim Measure (IM) to address chromium concentrations in groundwater at the Topock Compressor Station near Needles, California. The IM consists of groundwater extraction in the Colorado River floodplain and management of extracted groundwater. The groundwater extraction, treatment, and injection systems are collectively referred to as Interim Measure No. 3 (IM No. 3). Currently, the IM No. 3 facilities include a groundwater extraction system, conveyance piping, a groundwater treatment plant, and an injection well field for the discharge of the treated groundwater. Figure 1 shows the location of the IM No. 3 extraction, conveyance, treatment, and injection facilities. (All figures are provided at the end of this report.)

The *Groundwater Compliance Monitoring Plan for Interim Measures No. 3 Injection Area, Topock Compressor Station, Needles, California* (CH2M HILL, 2005a) was submitted to the California Regional Water Quality Control Board, Colorado River Basin Region (Water Board) and the California Environmental Protection Agency, Department of Toxic Substances Control (DTSC) on June 17, 2005 (herein referred to as the Compliance Monitoring Plan). The Compliance Monitoring Plan and its addendum provide the objectives, proposed monitoring program, data evaluation methods, and reporting requirements for the Compliance Monitoring Program (CMP). In a letter dated June 9, 2006, DTSC modified the reporting requirements of the Compliance Monitoring Plan (DTSC, 2006).

On October 13, 2004, the Water Board adopted Waste Discharge Requirements (WDR) Order No. R7-2004-0103. This WDR authorized PG&E to inject treated groundwater into wells located in the East Mesa area of the Topock site. This WDR was superseded on September 20, 2006 by WDR No. R7-2006-0060, which has similar terms. Work described in this report was performed in accordance with the WDR No. R7-2006-0060.

The WDR specifies effluent limitations, prohibitions, specifications, and provisions for subsurface injection. Monitoring and Reporting Program (MRP) No. R7-2004-0103 specified the requirements for the CMP to monitor the aquifer in the injection well area to ensure that the injection of treated groundwater is not causing an adverse effect on the aquifer water quality. As with the WDR, MRP No. R7-2004-0103 was superseded on September 20, 2006 by MRP No. R7-2006-0060 with similar requirements.

The injection system consists of two injection wells (IWs): IW-2 and IW-3. Operation of the treatment system was conditionally approved on July 15, 2005 (DTSC, 2005), and injection into IW-2 began on July 31, 2005. Table 1 is a summary of the history of injection for IM No. 3. (All tables are provided at the end of this report.)

Figure 2 shows the locations of the injection wells and the groundwater monitoring wells (observation wells [OWs] and compliance wells [CWs]) in the CMP. Table 2 is a summary of information on well construction and sampling methods for all wells in the CMP.

On January 22, 2007 (DTSC, 2007), DTSC approved a reduction of constituents analyzed during quarterly sampling of the CMP observation wells (details are provided in

CH2M HILL, 2006). The Water Board concurred in a letter dated January 23, 2007 (Water Board, 2007a).

On October 16, 2007, the Water Board approved collecting pH measurements in the field rather than through laboratory analysis due to the change to 15-minute holding time for laboratory measurements specified by United States Environmental Protection Agency (USEPA) Method 150.1 (Water Board, 2007b). DTSC provided concurrence for the field pH change in an e-mail dated January 22, 2008 (DTSC, 2008a). This change became effective with the first quarter 2008 sampling event.

On November 13, 2007, the Water Board approved a modification to hexavalent chromium (Cr[VI]) analytical methods, which extended the holding time from 24 hours to 28 days (Water Board, 2007c). DTSC provided concurrence for the 28-day holding time for Cr(VI) analyses in an e-mail dated January 22, 2008 (DTSC, 2008a). The first quarter 2008 sampling event was the first event to incorporate the new 28-day holding time for analyzing Cr(VI).

PG&E proposed modifications to the CMP, including the sampling and reporting frequency and the field pH trigger range for the CMP contingency plan, to the Water Board and the DTSC on July 3, 2008. On August 28, 2008, the Water Board approved these modifications as Revision 1 to the MRP (Water Board, 2008). On December 12, 2008, the modification of the CMP contingency plan pH range to a field pH range of 6.2 to 9.2 was also approved by the DTSC (DTSC, 2008b). The remaining MRP modifications were approved by DTSC on September 3, 2009 (DTSC, 2009).

With the approval of the MRP modifications, quarterly sampling is no longer required.

As of October 2010, samples are collected from OWs and CWs (Figure 2) according to the following schedule:

- Three OWs (OW-1S, OW-2S, and OW5S) located near the IM No. 3 injection well field are sampled semiannually (during the second and fourth quarters) for a limited suite of constituents.
- Six OWs (OW-1M, OW-1D, OW-2M, OW-2D, OW-5M, and OW-5D) are:
    - Sampled annually for a limited suite of constituents during the fourth quarter.
    - Sampled for a full suite of constituents one cluster at a time on a triennial (once every 3 years) schedule. Within a 3-year period, all OW middle and deep wells will be sampled for a full suite of constituents. The triennial sampling will occur during the annual event (fourth quarter).
- Eight CWs are sampled semiannually for a limited suite of constituents and annually (during the fourth quarter) for a full suite of constituents.

For semiannual events, laboratory analyses include total dissolved solids (TDS), turbidity, specific conductance, and a reduced suite of metals. For annual events for select OWs, laboratory analyses include TDS, turbidity, specific conductance, and a reduced suite of metals. Annual and triennial sampling events for CWs and select OWs include dissolved chromium, Cr(VI), metals, specific conductance, TDS, turbidity, and major inorganic cations and anions. Groundwater elevation data and field water quality data—including specific conductance, temperature, pH, oxidation-reduction potential, dissolved oxygen, turbidity and salinity—are also measured during each monitoring event (CH2M HILL, 2005a).

This report presents the results of the second half 2010 CMP groundwater monitoring event.

2.0 Second Half 2010 Activities

This section provides a summary of the monitoring and sampling activities completed during the second half 2010. The second half 2010 event was an annual event conducted from October 1 through October 6, 2010 and consisted of:

- Nine observation and eight compliance monitoring wells were sampled for water quality analyses.
- Groundwater elevations and field water quality data were collected prior to sampling.
- Two duplicate samples were collected at wells CW-3M and OW-1S to assess field sampling and analytical quality control.

Continuous groundwater elevation data were collected using pressure transducers/data loggers at five of the 17 CMP wells and were downloaded monthly during the reporting period.

The sampling methods, procedures, field documentation of the CMP sampling, water level measurements, and field water quality monitoring were performed in accordance with the *Sampling, Analysis, and Field Procedures Manual, Revision 1, PG&E Topock Compressor Station, Needles, California* (CH2M HILL, 2005b) and addendums.

CMP groundwater samples were analyzed by Truesdail Laboratories, Inc. in Tustin, California and EMAX Laboratories, Inc. in Torrance, California, both California-certified analytical laboratories. Analytical methods, sample volumes and containers, sample preservation, and quality control sample requirements were in accordance with the *Sampling, Analysis, and Field Procedures Manual, Revision 1, PG&E Topock Compressor Station, Needles, California* (CH2M HILL, 2005b) and addendums. Data validation and management were conducted in accordance with the *Quality Assurance Project Plan* [QAPP] *Addendum to the PG&E Program Quality Assurance Project Plan for the Topock Groundwater Monitoring and Investigation Projects* (CH2M HILL, 2008).

3.0 Second Half 2010 Results

This section is a summary of the results of the CMP groundwater sampling conducted during the second half 2010. Figure 2 presents the locations of the CMP groundwater wells.

The data presented include results for Cr(VI), chromium, specific conductance, metals, TDS, turbidity, and major inorganic cations and anions. Laboratory data quality review, water level measurements, and water quality field parameter data are also presented in this section. The laboratory reports and field data sheets for the Second Half 2010 monitoring event are presented in Appendices A and B, respectively.

3.1 Analytical Results

Nine observation wells and eight compliance wells were sampled during the second half 2010 sampling event. Analytical results for Cr(VI), chromium, other metals, and general chemistry parameters are presented in Tables 3, 4, and 5 and are discussed below. Interim action levels/water quality objectives (WQOs) were updated on August 8, 2006, when PG&E submitted a revised contingency plan flowchart for groundwater quality changes associated with the injection system. The contingency plan specifies the concentrations and values for Cr(VI), chromium, TDS, and pH to be used to determine if contingency plan actions were necessary based on sample results.

3.1.1 Hexavalent Chromium and Chromium

Table 3 presents the Cr(VI) and chromium analytical results for groundwater in the shallow, middle, and deep wells from the second half 2010 CMP sampling event. For shallow wells, the maximum detected Cr(VI) concentration was 34.3 micrograms per liter (µg/L) in well OW-2S on October 5, 2010. For the middle wells, the maximum detected Cr(VI) concentration was 13.7 µg/L in well CW-4M on October 5, 2010. For the deep wells, the maximum detected Cr(VI) concentration was 2.3 µg/L in well OW-1D on October 1, 2010.

During the Second Half 2010 sampling event, a sample from OW-2S exceeded the WQO of 32.6 µg/L for Cr(VI). The October 5, 2010 sample from OW-2S had a Cr(VI) concentration of 34.3 µg/L. This exceedance is not considered to be the result of injection of treated groundwater since the average effluent concentration of Cr(VI) from the IM No. 3 treatment plant is normally below 1 µg/L (CH2M HILL, 2010a). The contingency plan was not triggered due to the Cr(VI) concentration detected in OW-2S during the Second Half 2010.

For shallow wells, the maximum detected chromium concentration was 29.3 µg/L in well OW-2S on October 5, 2010. For the middle wells, the maximum detected chromium concentration was 11.8 µg/L in well CW-4M on October 5, 2010. For the deep wells, the maximum detected chromium concentration was 2.9 µg/L in well CW-1D on October 1, 2010.

During the Second Half 2010 sampling event, a sample from OW-2S exceeded the WQO of 28 µg/L for chromium. The October 5, 2010 sample from well OW-2S had a chromium concentration of 29.3 µg/L. This exceedance is not considered to be the result of injection of treated groundwater since the average effluent concentration of chromium from the IM No. 3 treatment plant is normally non-detect with a reporting limit of 1 µg/L (CH2M HILL, 2010a).

Chromium and Cr(VI) concentrations at OW-2S have been consistently above the WQOs since November 2005. The exceedances of Cr(VI) and chromium are thus considered reflective of the natural variance in background water quality. The contingency plan was not triggered due to the chromium concentrations detected in OW-2S during the Second Half 2010.

3.1.2 Other Metals and General Chemistry

Table 4 presents the other metals and cation results for the CMP groundwater wells sampled during the Second Half 2010. Metals and cations detected in the Second Half 2010 sampling event included aluminum, arsenic, barium, boron, calcium, magnesium, molybdenum, potassium, sodium, and vanadium. In general, concentrations of metals and cations detected during the Second Half 2010 sampling event are similar to those detected in previous sampling events.

Table 5 presents other inorganic analyte results from the CMP wells. During the Second Half 2010, the sampling results from all wells were within the WQOs for TDS (10,800 milligrams per liter [mg/L]) and pH (6.2 to 9.2). Sampling results for TDS varied from 932 mg/L in well OW-2S to 5,820 mg/L in well CW-3M. Field pH varied from 7.56 in well CW-1D to 8.01 in well CW-3D.

3.2 Analytical Data Quality Review

The laboratory analytical data generated from the Second Half 2010 CMP monitoring event were independently reviewed by project chemists to assess data quality and identify deviations from analytical requirements. The quality assurance and quality control requirements are outlined in the *PG&E Program Quality Assurance Project Plan* (CH2M HILL, 2008) *Addendum to the PG&E Program QAPP for the Topock Groundwater Monitoring and Investigation Projects.*

3.2.1 Matrix Interference

For the Second Half 2010 sampling event, matrix interference was encountered in 11 groundwater samples that affected the sensitivity for Cr(VI) when using USEPA method E218.6. The Cr(VI) sample results from CW-1D, CW-1M, CW-2M, CW-3M, CW-3M field duplicate, CW-4D, OW-1D, OW-1M, OW-2M, OW-5D, and OW-5M reflect an adjusted reporting limit of 1 µg/L as a result of the serial dilution that was required to overcome the matrix interference and provide an acceptable matrix spike recovery. No qualifier flags were applied.

3.2.2 Matrix Spike Samples

For the Second Half 2010 sampling event, matrix spike acceptance criteria were met.

3.2.3 Quantitation and Sensitivity

For the Second Half 2010 sampling event, with the exception of the matrix interference issues discussed in Section 3.2.1, all method and analyte combinations met the project reporting limit objectives.

3.2.4 Holding Time Data Qualification

For the Second Half 2010 sampling event, all method holding time requirements were met.

3.2.5 Field Duplicates

For the Second Half 2010 sampling event, the turbidity results from two of the field duplicate pairs had relative percent difference greater than the upper control limit. The four samples, detected results, were qualified as estimated and "J" flagged. All other field duplicate acceptance criteria were met.

3.2.6 Method Blanks

For the Second Half 2010 sampling event, method blank acceptance criteria were met.

3.2.7 Equipment Blanks

For the Second Half 2010 sampling event, equipment blank acceptance criteria were met.

3.2.8 Laboratory Duplicates

For the Second Half 2010 sampling event, laboratory duplicate acceptance criteria for the methods were met.

3.2.9 Calibration

For the Second Half 2010 sampling event, initial and continuing calibrations were performed as required by the methods. All calibration criteria were met.

3.2.10 Conclusion

For the Second Half 2010 sampling event, the completeness objectives were met for all method and analyte combinations. The analyses and data quality met the QAPP and laboratory method quality control criteria except as noted above. Overall, the analytical data are considered acceptable for the purpose of the CMP.

3.3 Influence of Treated Water

3.3.1 Post-injection Versus Pre-injection

Injection of treated water began on July 31, 2005. Under WDR No. R7-2006-0060 for the IM No. 3 groundwater treatment system, PG&E is required to submit WDR monitoring reports on the operation of the system. These reports contain the analytical results of treated water effluent sampling and, as such, the reports are useful in determining the baseline water quality of the treated water being injected into the IM No. 3 injection well field. Table 6 provides selected effluent water analytical results from three of the monthly reports:

August 29, 2005, July 2, 2007, and October 5, 2010. While there are differences among some parameters in these samples, a number of parameters show relatively consistent concentrations in the effluent over time. Analytes that are relatively consistent over the injection time period include Cr(VI), chromium, fluoride, molybdenum, nitrate/nitrite as nitrogen, sulfate, and TDS. These seven constituents provide a characterization of the effluent that does not appear to vary greatly over time and can serve as a basis for determining if a groundwater monitoring well is being affected by injection. In general terms, treated water has the following characteristics (based on review of December 2005 through October 2010 effluent characteristics):

- Cr(VI): typically non-detect (or below 1.0 µg/L)
- Chromium: typically non-detect (1.0 µg/L)
- Fluoride: approximately 2 mg/L
- Molybdenum: approximately 15 µg/L
- Nitrate/nitrite as nitrogen: approximately 3.0 mg/L
- Sulfate: approximately 500 mg/L
- TDS: approximately 4,000 mg/L

These treated water quality characteristics are meant to serve as a general guideline and not as a statistically representative sampling of the treated water quality over time.

Table 6 also lists the results of baseline sampling for the observation wells and compliance wells. A full set of nine OW groundwater samples was collected on July 27 and 28, 2005, and a full set of eight CW groundwater samples was collected on September 15, 2005. These samples are considered representative of conditions unaffected by injection and serve to characterize the pre-injection water quality. In comparing these sampling results to the treated injection water sampling results, there are some similarities in the constituent concentrations. For example, most of the pre-injection OW or CW deep well samples (OW-1D, OW-2D, OW-5D, CW-3D, and CW-4D) contain no detectable Cr(VI) or chromium, which is similar to the treated injection water. Most of the well samples show concentrations similar to the treated water for two or three constituents but observable differences in concentration from the treated water for the remaining four or five. By considering the entire suite of seven analytes and focusing on those parameters that show differences, it is relatively easy to distinguish between the pre-injection water quality at the monitoring wells and the treated water effluent quality.

Table 7 presents a comparison between the treated water quality and the results from the most recent sampling event (the Second Half 2010 sampling event). These samples were collected after approximately 62 months of injection. While the pre-injection OW and CW sample results were significantly different from the treated water quality, a number of the Second Half 2010 sample results show a marked similarity to the treated water results. The following wells display the general characteristics of treated water: OW-1M, OW-1D, OW-2M, OW-2D, OW-5M, OW-5D, CW-1M, CW-1D, CW-2D, CW-3D, and CW-4D. These wells are at locations and depths where the treated water injection front has largely replaced the local pre-injection groundwater. Wells CW-2M and CW-4M have chemical characteristics approaching that of treated water. To date, all shallow observations wells (wells OW-1S, OW-2S, and OW-5S) and compliance well CW-3M do not show water quality effects due to injection of treated water, indicating that injected water has not yet reached these depths and locations. However, wells OW-1S and OW-5S have shown increasing trends in TDS over the past year, suggesting that the injection front is approaching these wells.

3.3.2 Water Quality Hydrographs

Trend data can be used to determine when a rapid change has occurred between sampling events, such as the arrival of the injection front. It can also be used to look at more gradual changes that occur over several sampling events, such as seasonal effects or the interaction of treated water with local groundwater and host aquifer material. Eleven analytes were selected for time-series analysis; these analytes are considered to be most representative of the IM No. 3 injection well field area and have sufficient detections to make time-series analysis useful. The analytes include chloride, chromium, fluoride, Cr(VI), molybdenum, nitrate/nitrite as nitrogen, pH, sodium, sulfate, TDS, and vanadium. Water quality hydrographs (time-series plots) of these 11 analytes in each observation well during Second Half 2010 within the IM No. 3 injection well field are presented in Figures 3A through 3E.

Observation well water quality hydrographs are presented in Figures 3A through 3C. These hydrographs show the same overall patterns: wells that are identified as affected by treated water injection show a shift in water quality for characteristic parameters, while those identified as being unaffected by injection show no net trends. The water quality change brought on by the arrival of the treated water injection front can be either gradual (OW-5M) or step-wise (OW-2M), with most affected wells showing a pattern of change somewhere between the two. Based on the variability in response, it is inferred that the movement of treated water is non-uniform laterally between wells. This variability in lateral movement can be inferred from differences in the water quality hydrographs in both the mid-depth and deep wells. The OW shallow-depth wells (OW-1S, OW-2S, and OW-5S) show little water quality variation over time and generally have no net trends over time. Sodium, chloride, vanadium, and molybdenum are particularly consistent with baseline pre-injection concentrations and show that the local groundwater quality at shallow depths is not being affected by injection of treated water or outside water sources.

Compliance well water quality hydrographs are presented in Figures 3D and 3E. Wells CW-1M, CW-1D, CW-2D, CW-3D, and CW-4D show trends in TDS, sulfate, nitrate/nitrite as nitrogen, chromium, molybdenum, and Cr(VI) similar to the treated water. Wells CW-1M, CW-2M, and CW-4M show decreasing trends in Cr(VI) and chromium. These changes are attributed to the arrival of treated injection water.

3.4 Water Level Measurements

Table 8 presents the manual water level measurements and groundwater elevations for the third and fourth quarter 2010 along with the first and second quarters 2010 per the approved modifications by the Water Board (Water Board, 2008). In compliance with Condition No. Two of DTSC’s 2009 conditional approval letter (DTSC, 2009), confirmation was obtained from the IM3 Plant Manager on either the morning before or of manual water level collection at the CMP wells that the IM3 plant was operating normally on both the day before and the day of sample collection, with no backwash or unplanned shutdowns.

As a requirement of the conditional approval by DTSC (DTSC, 2005) and subsequent modifications (DTSC, 2009), water level measurements were collected continuously (measurements collected every half hour) with pressure transducers to produce hydrographs for select wells. Figures 4A through 4C present hydrographs that illustrate groundwater elevation trends and vertical hydraulic gradients observed over the Second Half 2010 reporting period at select observation monitoring wells.

Groundwater elevation maps for shallow, middle, and deep wells are provided as Figures 5A through 5C. A snapshot of water level elevations was used to produce the groundwater elevation contour plots. The date is noted on each figure.

3.4.1 Groundwater Gradient Characteristics

The monitoring wells in the middle and deep zone categories are screened over a wide elevation range (74 feet in the middle zone wells and 59 feet in the deep wells). Because there are natural vertical gradients as well as vertical gradients induced by injection, the relationships of groundwater elevations for wells in each category will reflect a mixture of vertical and horizontal gradients in groundwater elevation. Therefore, the groundwater contours in Figures 5B and 5C should be viewed as approximate.

The injection well field is located in the East Mesa area of the Topock site (Figure 2). Overall sitewide water level contour maps for shallow wells are prepared annually, with flow consistently being shown to move to the east, northeast across the uplands portions of the site (CH2M HILL, 2010b).

The effects of injection in the IM No. 3 injection well field are superimposed on the more regional Topock site flow system and, as expected, a groundwater mound can be seen around the injection wells. This mound is centered on the active injection well IW-3. The potentiometric surfaces in prior CMP reports mapped the growth of the groundwater mound over time and show that, after 62 months of injection, the mound increased and then stabilized in height at several tenths of a foot in elevation above the surrounding water level elevations. Figures 5B and 5C present groundwater elevation contours for the average groundwater elevation of the mound within the middle and deep wells using November 29, 2010 groundwater elevations. As expected with a mound, the potentiometric surface of the deep wells is slightly broader, while the potentiometric surface of the middle wells is more localized to the vicinity of the injection wells. The mound is elliptical in shape, with the major axis running in a southwest to northeast direction. The lower gradients (broader contours) in the direction of the major axis are an indication that the aquifer permeabilities are greater in this direction, indicating that there may be a preferred direction to flow in this area.

The vertical gradient in the IM No. 3 injection well field area is directed upward at all of the CW and OW well clusters and also upward between each of the depth intervals in those same well clusters. Table 9 presents the vertical gradient data calculated using the November 29, 2010 groundwater elevations. The magnitude of the vertical gradients is similar between clusters and between the depth intervals, indicating that the vertical gradient is generally of the same order of magnitude throughout the injection area. A component of the vertical gradients calculated in the vicinity of the IM No. 3 injection well field is undoubtedly related to the injection of treated water in the lower portions of the aquifer. The observed groundwater gradients in the IM No. 3 injection well field are consistent with expected regional groundwater flow within the southern Mohave Valley.

3.5 Field Parameter Data

A field water quality instrument and flow-through cell were used to measure water quality parameters during well purging and groundwater sampling. The measured field parameters included specific conductance, temperature, pH, oxidation-reduction potential, dissolved oxygen, turbidity, salinity, and water level elevations before sampling. Table 10 presents a summary of the field water quality data measured during the Second Half 2010 monitoring event. Field data sheets for the Second Half 2010 event are presented in Appendix B.

3.6 WDR Monitoring Requirements

Table 11 identifies the laboratory that performed each analysis and lists the following information as required by the WDR for the Second Half 2010 monitoring event:

- Sample location
- Sample identification number
- Sampler name
- Sample date
- Sample time
- Laboratory performing analysis
- Analysis method
- Parameter
- Analysis date
- Laboratory technician
- Result unit
- Sample result
- Reporting limit
- Method detection limit

4.0 Status of Monitoring Activities

4.1 Semiannual Monitoring

The next semiannual monitoring event will occur in April during the first half of 2011. This CMP monitoring event will include the sampling and analysis scope presented in the Compliance Monitoring Plan (CH2M HILL, 2005a, c) and subsequent approved scope revisions (DTSC, 2007, 2008a-b, 2009; Water Board, 2007a-b, 2008). The groundwater monitoring report for this CMP monitoring event will be submitted by July 15, 2011.

4.2 Annual Monitoring

The next annual monitoring event will occur in October during the second half of 2011. The groundwater monitoring report for this annual CMP monitoring event will be submitted by January 13, 2012.

5.0 References

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__________. 2010b. *Fourth Quarter 2009 and Annual Interim Measures Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California*. March 15.

6.0 Certification

PG&E submitted a signature delegation letter to the Water Board on September 20, 2006. The letter delegated PG&E signature authority to Mr. Curt Russell and Ms. Yvonne Meeks for correspondence regarding Board Order R7-2006-0060.

Certification Statement:

I declare under the penalty of law that I have personally examined and am familiar with the information submitted in this document, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of a fine and imprisonment for knowing violations.

Signature: Yvonne Meeks

Name: Yvonne J. Meeks

Company: Pacific Gas and Electric Company

Title: Topock Project Manager

Date: January 14, 2011

Tables

TABLE 1
Operational Status of Interim Measures No. 3 Injection Wells From Inception of Injection Through Second Half 2010
PG&E Topock Compliance Monitoring Program

Time Period	Injection Status
July 31, 2005 to Fourth Quarter 2005	Injection occurred at IW-2.
First Quarter 2006	Injection occurred primarily at IW-2 except during periods of operational testing, when injection was divided equally between IW-2 and IW-3.
Second Quarter 2006	Injection occurred at IW-2.
Third Quarter 2006	In August 2006, IW-2 went offline for routine maintenance, and injection commenced at IW-3.
Fourth Quarter 2006	Injection occurred at IW-3, except during routine maintenance.
First Quarter 2007	Injection occurred at IW-3 and transitioned over to IW-2 on March 8.
Second Quarter 2007	Injection occurred at IW-3 from April 3 through June 20. Injection switched to IW-2 on June 20 and continued through July 20, 2007.
Third Quarter 2007	Injection occurred at IW-3 after July 20. Injection occurred at IW-2 on August 30 for an injection test and then returned to IW-3 after August 31.
Fourth Quarter 2007	Injection occurred at IW-3 and then switched to IW-2 on September 25 for routine maintenance. Injection returned to IW-3 after October 9.
First Quarter 2008	Injection occurred at IW-3 only. From February 5 through February 13, well maintenance activities were conducted at IW-2.
Second Quarter 2008	Injection occurred at IW-3 only. IM-3 system offline from April 21 through April 28 due to routine maintenance. Backwashing occurred at IW-3 on April 9, May 7, May 15, May 22, June 3, and June 4, 2008.
Third Quarter 2008	Injection occurred primarily at IW-3. Injection also occurred at IW-2 for short period on July 25 and from August 12 – August 31, 2008. Backwashing events occurred at IW-3 on June 17, June 27, July 9, July 15, July 17, July 18, August 12, August 13, September 2, and September 3, 2008. Backwashing events occurred at IW-2 on September 9 - September 11, 2008.
Fourth Quarter 2008	Injection occurred at IW-3 and then switched to IW-2 on September 23. Injection returned to IW-3 on October 7 and switched back to IW-2 on October 21. Injection primarily occurred at IW-2 until November 11 when it switched to IW-3 until December 3, 2008. Injection continued at IW-2 until December 16, 2008 and occurred concurrently and continued at IW-3 on December 11, 2008.
First Quarter 2009	Injection switched to IW-2 on December 30, 2008. On January 13, 2009 injection transitioned to IW-3. Backwashing events occurred periodically during the periods when each injection well was offline. Routine and scheduled maintenance occurred 12/18/08 and 1/21/09 at which time both wells were offline.
Second Quarter 2009	Injection continued at IW-3 until April 20, 2009. Injection ceased from April 20, 2009 to April 27, 2009 due to routine maintenance after which injection continued at IW-3 until May 26, 2009 when it transitioned to IW-2. Injection continued at IW-2 until June 9, 2009 when it switched to IW-3. Injection returned to IW-2 on June 24, 2009.

TABLE 1
Operational Status of Interim Measures No. 3 Injection Wells From Inception of Injection Through Second Half 2010
PG&E Topock Compliance Monitoring Program

Time Period	Injection Status
Third Quarter 2009	IM3 injection alternates between the two wells approximately every two weeks. Injection continued at IW-2 until July 8, when it transitioned to IW-3. Injection ceased from July 23 to 27, 2009 when it continued at IW-3 until September 9, 2009. Unplanned downtime occurred from September 9-14, 2009. On September 16, 2009 injection continued at IW-2, except during times of routine maintenance or otherwise mentioned.
Fourth Quarter 2009	Injection occurred at IW-2 until November 25, 2009 when it switched to IW-3. Injection continued at IW-3, except during times of routine maintenance.
First Half 2010	Injection occurred mainly at IW-3 until March 3, 2010. Beginning March 3, 2010, IM3 injection alternated between the two wells approximately every two weeks until April 20, 2010 for a planned shutdown. On April 22, 2010, injection resumed at IW-3 and alternated between the two wells approximately every two weeks. Backwashing events occurred periodically during the periods when each injection well was offline.
Second Half 2010	During the second half 2010, injection occurred primarily at IW-2 with the exception of the following periods when it primarily occurred at IW-3: July 22 - August 25, August 30- September 7, September 16 – October 15, November 5-18, and December 17-31, 2010.

TABLE 2
Well Construction and Sampling Summary for Groundwater Samples, Second Half 2010
PG&E Topock Compliance Monitoring Program

Well ID	Site Area	Measuring Point Elevation (ft AMSL)	Screen Interval (ft bgs)	Well Casing (inches)	Well Depth (ft btoc)	Depth to Water (ft btoc)	Sampling System	Typical Purge Rate (gpm)	Typical Purge Volume (gallons)	Pump Depth (ft bgs)	Transducer Status	Remarks
IM Compliance Wells												
CW-01M	East Mesa	566.07	140 - 190	2 (PVC)	192.7	109.2	Temp. pump	2	44	165		
CW-01D	East Mesa	566.46	250 - 300	2 (PVC)	322.7	109.3	Temp. pump	3	110	180		
CW-02M	East Mesa	549.45	152 - 202	2 (PVC)	208.3	92.8	Temp. pump	2	60	195		
CW-02D	East Mesa	549.43	285 - 335	2 (PVC)	357.7	92.3	Temp. pump	3	135	159		
CW-03M	East Mesa	534.10	172 - 222	2 (PVC)	224.6	77.7	Temp. pump	2	74	180		
CW-03D	East Mesa	534.14	270 - 320	2 (PVC)	342.6	77.0	Temp. pump	3	135	143		
CW-04M	East Mesa	518.55	119.5 - 169.8	2 (PVC)	172.5	61.5	Temp. pump	2	55	160		
CW-04D	East Mesa	518.55	233 - 283	2 (PVC)	305.6	61.4	Temp. pump	3	125	134		
IM Observation Wells												
OW-01S	East Mesa	550.21	83.5 - 113.5	2 (PVC)	116.1	93.7	Temp. pump	1	12	100	Active	
OW-01M	East Mesa	550.36	165 - 185	2 (PVC)	188.4	93.2	Temp. pump	3	50	109.6		
OW-01D	East Mesa	550.36	257 - 277	2 (PVC)	279.6	92.9	Temp. pump	3	102	111.4		
OW-02S	East Mesa	548.88	71 - 101	2 (PVC)	103.6	92.4	Temp. pump	1	6	100	Active	
OW-02M	East Mesa	548.52	190 - 210	2 (PVC)	212.9	91.2	Temp. pump	2	60	111.4		
OW-02D	East Mesa	549.01	310 - 330	2 (PVC)	342.3	91.2	Temp. pump	3	120	110.3		
OW-05S	East Mesa	551.83	70 - 110	2 (PVC)	112.9	95.1	Temp. pump	1	9	100	Active	
OW-05M	East Mesa	551.81	210 - 250	2 (PVC)	253.0	94.6	Temp. pump	3	80	112.5	Active	
OW-05D	East Mesa	552.41	300 - 320	2 (PVC)	352.8	95.1	Temp. pump	3	130	113.2	Active	

Notes:

AMSL	above mean sea level
BGS	below ground surface
BTOC	below top of polyvinyl chloride (PVC) casing
Redi-Flo AR	adjustable-rate electric submersible pump
Temp	temporary
gpm	gallons per minute

Depth to water for each well was collected in October 2010.
All wells were purged and sampled using 3 well-volume method.

TABLE 3
Chromium Results for Groundwater Samples, Second Half 2010
PG&E Topock Compliance Monitoring Program

		Method:	E218.6	E200.8
Location ID	**Sample Date**		**Hexavalent Chromium (µg/L)**	**Chromium (µg/L)**
CW-01M	10/6/2010		3.80	3.60
CW-01D	10/6/2010		2.20	2.60
CW-02M	10/4/2010		4.30	4.20
CW-02D	10/4/2010		0.47	1.80
CW-03M	10/5/2010		9.80	9.70
CW-03M	10/5/2010	(FD)	11.1	9.60
CW-03D	10/4/2010		0.40	ND (1.0)
CW-04M	10/5/2010		13.7	11.8
CW-04D	10/5/2010		1.90	1.60
OW-01S	10/1/2010		18.3	17.6
OW-01S	10/1/2010	(FD)	18.3	17.6
OW-01M	10/1/2010		3.60	4.30
OW-01D	10/1/2010		2.30	2.90
OW-02S	10/5/2010		34.3	29.3
OW-02M	10/5/2010		4.00	4.00
OW-02D	10/5/2010		0.88	1.10
OW-05S	10/6/2010		20.3	18.9
OW-05M	10/6/2010		2.20	2.00
OW-05D	10/6/2010		1.20	1.60

Notes:

FD field duplicate
ND parameter not detected at the listed reporting limit
µg/L micrograms per liter

Hexavalent Chromium and Chromium are field filtered.

TABLE 4
Metals and Cation Results for Groundwater Samples, Second Half 2010
PG&E Topock Compliance Monitoring Program

	Method:	Dissolved E200.7, E200.8																								
Location ID	Sample Date	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Cobalt	Copper	Lead	Manganese	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Boron	Calcium	Iron [1]	Iron [2]	Potassium	Magnesium	Sodium
		µg/L																		mg/L						
CW-01M	10/6/2010	ND (50)	ND (10)	1.60	76.6	ND (1.0)	ND (3.0)	ND (5.0)	ND (5.0)	ND (10)	ND (10)	ND (0.2)	10.2	ND (10)	ND (10)	ND (5.0)	ND (1.0)	ND (5.0)	ND (10)	1.01	139	ND (0.02)	ND (0.02)	13.5	12.5	1380
CW-01D	10/6/2010	ND (50)	ND (10)	1.90	23.4	ND (1.0)	ND (3.0)	ND (5.0)	ND (5.0)	ND (10)	ND (10)	ND (0.2)	10.4	ND (10)	ND (10)	ND (5.0)	ND (1.0)	ND (5.0)	ND (10)	0.939	178	ND (0.02)	ND (0.02)	14.5	17.6	1320
CW-02M	10/4/2010	ND (50)	ND (10)	2.20	59.9	ND (1.0)	ND (3.0)	ND (5.0)	ND (5.0)	ND (10)	ND (10)	ND (0.2)	18.4	ND (10)	ND (10)	ND (5.0)	ND (1.0)	ND (5.0)	ND (10)	1.07	130	ND (0.02)	ND (0.02)	13.4	11.0	1300
CW-02D	10/4/2010	52.0	ND (10)	3.50	ND (10)	ND (1.0)	ND (3.0)	ND (5.0)	ND (5.0)	ND (10)	ND (10)	ND (0.2)	11.7	ND (10)	ND (10)	ND (5.0)	ND (1.0)	5.60	ND (10)	1.24	71.5	ND (0.02)	ND (0.02)	12.0	4.16	1440
CW-03M	10/5/2010	ND (50)	ND (10)	1.20	46.1	ND (1.0)	ND (3.0)	ND (5.0)	ND (5.0)	ND (10)	ND (10)	ND (0.2)	19.0	ND (10)	ND (10)	ND (5.0)	ND (1.0)	ND (5.0)	ND (10)	1.03	207	ND (0.02)	ND (0.02)	17.0	17.9	1580
CW-03M	10/5/2010 FD	ND (50)	ND (10)	ND (1.0)	46.1	ND (1.0)	ND (3.0)	ND (5.0)	ND (5.0)	ND (10)	ND (10)	ND (0.2)	17.3	ND (10)	ND (10)	ND (5.0)	ND (1.0)	ND (5.0)	ND (10)	1.04	203	ND (0.02)	ND (0.02)	16.8	18.0	1560
CW-03D	10/4/2010	ND (50)	ND (10)	1.40	10.3	ND (1.0)	ND (3.0)	ND (5.0)	ND (5.0)	ND (10)	ND (10)	ND (0.2)	29.8	ND (10)	ND (10)	ND (5.0)	ND (1.0)	ND (5.0)	ND (10)	1.33	69.2	ND (0.02)	ND (0.02)	13.0	5.75	1430
CW-04M	10/5/2010	ND (50)	ND (10)	3.00	79.9	ND (1.0)	ND (3.0)	ND (5.0)	ND (5.0)	ND (10)	ND (10)	ND (0.2)	ND (10)	ND (10)	ND (10)	ND (5.0)	ND (1.0)	ND (5.0)	ND (10)	0.812	156	ND (0.02)	ND (0.02)	13.6	14.3	1120
CW-04D	10/5/2010	ND (50)	ND (10)	3.60	20.7	ND (1.0)	ND (3.0)	ND (5.0)	ND (5.0)	ND (10)	ND (10)	ND (0.2)	21.6	ND (10)	ND (10)	ND (5.0)	ND (1.0)	ND (5.0)	ND (10)	1.24	121	ND (0.02)	ND (0.02)	14.0	8.85	1580
OW-01S	10/1/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
OW-01S	10/1/2010 FD	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
OW-01M	10/1/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
OW-01D	10/1/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
OW-02S	10/5/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
OW-02M	10/5/2010	ND (50)	ND (10)	ND (1.0)	51.3	ND (1.0)	ND (3.0)	ND (5.0)	ND (5.0)	ND (10)	ND (10)	ND (0.2)	21.5	ND (10)	ND (10)	ND (5.0)	ND (1.0)	ND (5.0)	ND (10)	0.961	178	ND (0.02)	ND (0.02)	15.1	21.8	1300
OW-02D	10/5/2010	ND (50)	ND (10)	3.90	15.3	ND (1.0)	ND (3.0)	ND (5.0)	ND (5.0)	ND (10)	ND (10)	ND (0.2)	17.4	ND (10)	ND (10)	ND (5.0)	ND (1.0)	ND (5.0)	ND (10)	0.962	131	ND (0.02)	ND (0.02)	16.0	23.0	1270
OW-05S	10/6/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
OW-05M	10/6/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
OW-05D	10/6/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

NOTES:
FD field duplicate
ND parameter not detected at the listed reporting limit
mg/L milligrams per liter
µg/L micrograms per liter
--- data not collected or available
J concentration estimated by laboratory or data validation

[1] Total Iron
[2] Dissolved Iron

TABLE 5
Other Inorganics Results for Groundwater Samples, Second Half 2010
PG&E Topock Compliance Monitoring Program

	Method:	E120.1	Field	SM2540C	SM2130B	E300.0	E300.0	E300.0	SM4500NO3E	SM2320B	SM4500NH3D
Location ID	Sample Date	Specific Conductance (µmhos/cm)	Field pH	Total Dissolved Solids (mg/L)	Turbidity (NTU)	Chloride (mg/L)	Fluoride (mg/L)	Sulfate (mg/L)	Nitrate/Nitrite as Nitrogen (mg/L)	Alkalinity, total as CaCo3 (mg/L)	Ammonia as Nitrogen (mg/L)
CW-01M	10/6/2010	7380	7.66	4580	0.318	2120	1.65	507	1.87	71.0	ND (0.5)
CW-01D	10/6/2010	7380	7.56	4570	0.557	2210	1.79	511	2.12	68.0	ND (0.5)
CW-02M	10/4/2010	7140	7.85	4300	0.251	2830	2.87	440	2.52	52.0	ND (0.5)
CW-02D	10/4/2010	7190	7.97	4090	0.291	2520	4.39	478	2.96	69.0	ND (0.5)
CW-03M	10/5/2010	8630	7.64	5820	0.373 J	2680	2.76	427	0.641	48.0	ND (0.5)
CW-03M	10/5/2010 (FD)	8540	---	5720	0.161 J	2660	2.64	427	1.17	50.0	ND (0.5)
CW-03D	10/4/2010	7220	8.01	4360	0.140	2060	5.71	475	2.58	65.0	ND (0.5)
CW-04M	10/5/2010	6610	7.67	4380	0.260	2060	1.88	361	1.30	54.0	ND (0.5)
CW-04D	10/5/2010	8190	7.80	5060	0.175	2420	3.86	505	1.90	61.0	ND (0.5)
OW-01S	10/1/2010	3780	7.66	2300	2.260 J	1070	2.10	216	3.09	---	---
OW-01S	10/1/2010 (FD)	3670	---	2540	3.570 J	1150	2.03	243	3.42	---	---
OW-01M	10/1/2010	7250	7.75	4680	0.125	2110	2.17	507	3.12	---	---
OW-01D	10/1/2010	7320	7.73	3790	0.372	1990	1.93	513	2.87	---	---
OW-02S	10/5/2010	1690	7.94	932	0.662	388	5.09	106	3.05	---	---
OW-02M	10/5/2010	7260	7.69	4640	0.262	2130	2.76	500	2.41	50.0	ND (0.5)
OW-02D	10/5/2010	7270	7.87	4470	0.386	2150	2.19	490	2.30	44.0	ND (0.5)
OW-05S	10/6/2010	2320	7.67	1340	1.970	595	2.27	122	2.45	---	---
OW-05M	10/6/2010	7240	7.65	4550	0.567	2150	2.81	501	1.95	---	---
OW-05D	10/6/2010	7260	7.86	4410	0.670	2040	2.67	500	1.95	---	---

NOTES:

ND	parameter not detected at the listed reporting limit
FD	field duplicate
µmhos/cm	micro-mhos per centimeter
NTU	Nephelometric Turbidity Unit
mg/L	milligrams per liter
---	data not collected, available
J	concentration estimated by laboratory or data validation

TABLE 6
Treated Water Quality Compared to OW and CW Pre-injection Water Quality
PG&E Topock Compliance Monitoring Program

Location ID	Sample Date	Hexavalent Chromium (µg/L)	Chromium (µg/L)	Fluoride (mg/L)	Dissolved Molybdenum (µg/L)	Nitrate/ Nitrite as Nitrogen (mg/L)	Sulfate (mg/L)	TDS (mg/L)
Treated Water	8/29/2005	ND(1.0)	ND (2.1)	1.95	8.3	3.7	450	3620
Treated Water	7/2/2007	ND(0.2)	ND (1.0)	2.18	17.5	2.60	477	3980
Treated Water	10/5/2010	0.31	ND (1.0)	2.05	17.6	2.89	497	4190
OW-01S	7/28/2005	19.4	23.5	2.45	17.2	3.2	114	1320
OW-01M	7/27/2005	16.3	18.9	2.31	27	1.01	311	3450
OW-01D	7/27/2005	ND(1.0)	ND(1.3)	1.14	46.1	0.321	441	6170
OW-02S	7/28/2005	15.3	14.8	3.79	35.6	3.81	126	1090
OW-02M	7/28/2005	5.4	5.7	2.19	32.4	0.735	342	4380
OW-02D	7/28/2005	ND(1.0)	ND(1.2)	0.966	51.2	0.1	616	9550
OW-05S	7/28/2005	23.4	25.6	2.3	17.1	3.55	105	1060
OW-05M	7/28/2005	8.6	8.8	2.74	35.4	0.621	417	5550
OW-05D	7/28/2005	ND(1.0)	ND(1.2)	1.11	57	0.151	480	8970
CW-01M	9/15/2005	18.1	17.8	2.34	21.6	1.11	318	2990
CW-01D	9/15/2005	ND(1.0)	1.6	0.951	32.1	0.972	379	6230
CW-02M	9/15/2005	15.8	15.5	2.3	23.1	0.908	342	3500
CW-02D	9/15/2005	ND(1.0)	1.6	0.982	41.6	0.28	601	8770
CW-03M	9/15/2005	8.8	8.1	2.57	24.2	0.642	464	4740
CW-03D	9/15/2005	ND(1.0)	ND(1.0)	1.4	29.2	0.304	672	9550
CW-04M	9/15/2005	19.2	19	1.5	12.3	1.18	240	3310
CW-04D	9/15/2005	ND(1.0)	ND(1.0)	1.01	26	0.188	534	7470

NOTES:

ND Not detected at the listed reporting limit.
mg/L milligrams per liter
µg/L micrograms per liter

Hexavalent chromium samples were analyzed using method 7199 in 2005 and then by method E218.6.
Chromium samples were analyzed using method 6020A for samples collected on 7/28/2005, by method 6010B for samples collected on 9/15/2005, by method 6020B for samples collected on 8/29/2005 and by method E200.8 for all other chromium samples.
Chromium samples of the treated water were unfiltered.

TABLE 7

Treated Water Quality Compared to Second Half 2010 Sampling Event Water Quality

PG&E Topock Compliance Monitoring Program

Location ID	Sample Date	Hexavalent Chromium (µg/L)	Chromium (µg/L)	Fluoride (mg/L)	Molybdenum (µg/L)	Nitrate/Nitrite as Nitrogen (mg/L)	Sulfate (mg/L)	Total Dissolved Solids (mg/L)
Treated Water	12/2/2009	ND (0.2)	ND (1.0)	2.40	14.2	3.12	521	4490
Treated Water	4/7/2010	0.29	ND (1.0)	1.82	18.6	2.87	512	4270
Treated Water	10/5/2010	0.31	ND (1.0)	2.05	17.6	2.89	497	4190
CW-01M	10/6/2010	3.80	3.60	1.65	10.2	1.87	507	4580
CW-01D	10/6/2010	2.20	2.60	1.79	10.4	2.12	511	4570
CW-02M	10/4/2010	4.30	4.20	2.87	18.4	2.52	440	4300
CW-02D	10/4/2010	0.47	1.80	4.39	11.7	2.96	478	4090
CW-03M	10/5/2010 (FD)	11.1	9.60	2.64	17.3	1.17	427	5720
CW-03M	10/5/2010	9.80	9.70	2.76	19.0	0.641	427	5820
CW-03D	10/4/2010	0.40	ND (1.0)	5.71	29.8	2.58	475	4360
CW-04M	10/5/2010	13.7	11.8	1.88	ND (10)	1.30	361	4380
CW-04D	10/5/2010	1.90	1.60	3.86	21.6	1.90	505	5060
OW-01S	10/1/2010 (FD)	18.3	17.6	2.03	---	3.42	243	2540
OW-01S	10/1/2010	18.3	17.6	2.10	---	3.09	216	2300
OW-01M	10/1/2010	3.60	4.30	2.17	---	3.12	507	4680
OW-01D	10/1/2010	2.30	2.90	1.93	---	2.87	513	3790
OW-02S	10/5/2010	34.3	29.3	5.09	---	3.05	106	932
OW-02M	10/5/2010	4.00	4.00	2.76	21.5	2.41	500	4640
OW-02D	10/5/2010	0.88	1.10	2.19	17.4	2.30	490	4470
OW-05S	10/6/2010	20.3	18.9	2.27	---	2.45	122	1340
OW-05M	10/6/2010	2.20	2.00	2.81	---	1.95	501	4550
OW-05D	10/6/2010	1.20	1.60	2.67	---	1.95	500	4410

Notes:

FD field duplicate
ND parameter not detected at the listed reporting limit
mg/L milligrams per liter
µg/L micrograms per liter
--- not sampled or required for this event

All hexavalent chromium samples were analyzed with method E218.6

All chromium and molybdenum samples were analyzed with method E200.8. Chromium and molybdenum samples were field filtered, except for the treated water.

Fluoride and Sulfate samples were analyzed with method E300.0.

All nitrate/nitrite as nitrogen samples were analyzed with method SM4500NO3E, except for treated water which used method E300.

All total dissolved solid samples were analyzed with method SM2540C.

TABLE 8
Manual Water Level Measurements and Elevations, Second Half 2010
PG&E Topock Compliance Monitoring Program

Location ID	Well Depth (feet BTOC)	Measuring Point Elevation (feet AMSL)	Monitoring Date & Time		Water Level Measurement (feet BTOC)	Salinity (%)	Groundwater/Water Elevation Adjusted for Salinity (feet AMSL)
CW-01M	192.7	566.07	23-Mar-10	10:25 AM	109.69	0.66	456.41
			02-Jun-10	9:38 AM	108.53	0.47	457.47
			13-Sep-10	12:12 PM	108.57	0.48	457.43
			29-Nov-10	12:15 PM	109.18	0.48	456.82
CW-01D	322.7	566.46	23-Mar-10	10:28 AM	109.71	0.70	456.88
			02-Jun-10	9:41 AM	108.71	0.49	457.60
			13-Sep-10	12:14 PM	108.63	0.50	457.68
			29-Nov-10	12:17 PM	109.25	0.50	457.06
CW-02M	208.3	549.45	23-Mar-10	10:15 AM	93.18	0.68	456.35
			02-Jun-10	9:24 AM	92.08	0.50	457.31
			13-Sep-10	12:17 PM	92.09	0.49	457.28
			29-Nov-10	12:06 PM	92.75	0.49	456.62
CW-02D	357.7	549.43	23-Mar-10	10:17 AM	92.71	0.60	456.69
			02-Jun-10	9:20 AM	91.73	0.51	457.51
			13-Sep-10	12:19 PM	91.61	0.49	457.59
			29-Nov-10	12:03 PM	92.28	0.49	456.92
CW-03M	224.6	534.10	23-Mar-10	10:22 AM	78.00	0.84	456.36
			02-Jun-10	9:33 AM	76.96	0.60	457.15
			13-Sep-10	12:22 PM	76.97	0.60	457.15
			29-Nov-10	12:12 PM	77.68	0.60	456.44
CW-03D	342.6	534.14	23-Mar-10	10:20 AM	77.40	0.66	456.83
			02-Jun-10	9:31 AM	76.40	0.55	457.61
			13-Sep-10	12:23 PM	76.34	0.53	457.63
			29-Nov-10	12:09 PM	76.98	0.53	456.99
CW-04M	172.5	518.55	23-Mar-10	10:36 AM	62.00	0.61	456.58
			02-Jun-10	9:51 AM	60.87	0.45	457.58
			13-Sep-10	11:50 AM	60.94	0.43	457.50
			29-Nov-10	12:28 PM	61.55	0.43	456.89
CW-04D	305.6	518.55	23-Mar-10	10:34 AM	61.84	0.84	457.10
			02-Jun-10	9:48 AM	60.85	0.58	457.63
			13-Sep-10	11:48 AM	60.78	0.51	457.59
			29-Nov-10	12:26 PM	61.43	0.51	456.94
OW-01S	116.1	550.21	02-Jun-10	9:58 AM	92.95	0.26	457.21
			13-Sep-10	11:55 AM	93.07	0.21	457.09
			29-Nov-10	12:34 PM	93.65	0.21	456.50
OW-01M	188.4	550.36	02-Jun-10	10:01 AM	92.77	0.49	457.50

TABLE 8
Manual Water Level Measurements and Elevations, Second Half 2010
PG&E Topock Compliance Monitoring Program

Location ID	Well Depth (feet BTOC)	Measuring Point Elevation (feet AMSL)	Monitoring Date & Time		Water Level Measurement (feet BTOC)	Salinity (%)	Groundwater/Water Elevation Adjusted for Salinity (feet AMSL)
OW-01M	188.4	550.36	13-Sep-10	11:56 AM	92.71	0.46	457.54
			29-Nov-10	12:36 PM	93.24	0.46	457.01
OW-01D	279.6	550.36	02-Jun-10	10:03 AM	92.53	0.49	457.66
			13-Sep-10	11:58 AM	91.95	0.48	458.23
			29-Nov-10	12:38 PM	92.86	0.48	457.32
OW-02S	103.6	548.88	02-Jun-10	10:11 AM	91.56	0.09	457.22
			13-Sep-10	12:01 PM	91.65	0.09	457.19
			29-Nov-10	12:43 PM	92.29	0.09	456.55
OW-02M	212.9	548.52	02-Jun-10	10:14 AM	90.90	0.49	457.51
			13-Sep-10	12:02 PM	90.65	0.49	457.75
			29-Nov-10	12:45 PM	91.22	0.49	457.18
OW-02D	342.3	549.01	02-Jun-10	10:07 AM	91.08	0.50	457.69
			13-Sep-10	12:04 PM	90.41	0.49	458.34
			29-Nov-10	12:41 PM	91.18	0.49	457.57
OW-05S	112.9	551.83	02-Jun-10	10:18 AM	94.45	0.14	457.33
			13-Sep-10	12:06 PM	94.50	0.17	457.28
			29-Nov-10	12:48 PM	95.13	0.17	456.64
OW-05M	253.0	551.81	02-Jun-10	10:21 AM	93.47	0.67	458.40
			13-Sep-10	12:07 PM	93.89	0.46	457.84
			29-Nov-10	12:50 PM	94.61	0.46	457.03
OW-05D	352.8	552.41	02-Jun-10	10:25 AM	94.31	0.76	458.34
			13-Sep-10	12:09 PM	94.50	0.52	457.88
			29-Nov-10	12:52 PM	95.12	0.52	457.11

Notes:

AMSL above mean sea level
BTOC below top of polyvinyl chloride (PVC) casing
% percentage

Salinity used to adjust water level to freshwater equivalent. Salinity values have been averaged in accordance with the Performance Monitoring Program.

TABLE 9
Vertical Gradients within the OW and CW Clusters
PG&E Topock Compliance Monitoring Program

Well Pairs	Vertical Gradient (ft/ft)[a]
CW-01D to CW-01M	0.0022
CW-02D to CW-02M	0.0022
CW-03D to CW-03M	0.0056
CW-04D to CW-04M	0.0004
OW-01M to OW-01S	0.0067
OW-01D to OW-01M	0.0034
OW-02M to OW-02S	0.0056
OW-02D to OW-02M	0.0032
OW-05M to OW-05S	0.0028

[a] Positive value signifies an upward gradient.

Gradients calculated using November 29, 2010 groundwater levels.

TABLE 10
Field Parameters and Manual Water Level Measurements for Groundwater Samples, Second Half 2010
PG&E Topock Compliance Monitoring Program

Location ID	Sampling Date	Specific Conductance (µmhos/cm)	Temperature (°C)	pH	ORP (mV)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	Salinity (%)	Depth To Water (feet BTOC)
CW-01M	10/6/2010	7750	29.54	7.66	146	11.6	0.3	0.5	108.71
CW-01D	10/6/2010	7670	29.46	7.56	154.4	13.71	0.3	0.5	108.77
CW-02M	10/4/2010	7540	29.97	7.85	116.5	5.62	0.3	0.49	92.19
CW-02D	10/4/2010	7580	30.87	7.97	133.4	8.95	0.3	0.49	91.82
CW-03M	10/5/2010	9130	29.41	7.64	104.9	1.28	0.4	0.59	77.21
CW-03D	10/4/2010	7650	31.01	8.01	125.3	8.21	0.2	0.49	76.43
CW-04M	10/5/2010	4380	29.59	7.67	125.2	2.4	0.4	0.28	61.17
CW-04D	10/5/2010	7330	30.45	7.8	138.8	4.89	0.8	0.47	61.21
OW-01S	10/1/2010	4008	29.71	7.66	68.6	7.02	3.3	0.26	93.00
OW-01M	10/1/2010	7477	28.49	7.75	102.7	9.79	0.7	0.48	92.90
OW-01D	10/1/2010	7490	28.36	7.73	120	7.97	1.1	0.48	92.65
OW-02S	10/5/2010	1780	29.35	7.94	160.4	5.86	1.5	0.12	91.64
OW-02M	10/5/2010	7440	28.99	7.69	154.1	6.52	0.4	0.48	91.40
OW-02D	10/5/2010	7660	29.76	7.87	172	7.87	0.3	0.5	91.82
OW-05S	10/6/2010	2510	29.44	7.67	104.3	7.78	3.4	0.16	94.51
OW-05M	10/6/2010	7680	28.61	7.65	134	14.01	0.4	0.5	93.35
OW-05D	10/6/2010	7540	29.61	7.86	144.3	15.61	0.2	0.49	94.26

Notes:

µmhos/cm	micro-mhos per centimeter
°C	degree centigrade
ORP	oxidation reduction potential
mV	millivolts
mg/L	milligrams per liter
NTU	Nephelometric Turbidity Unit
%	percentage
BTOC	below top of polyvinyl chloride (PVC) casing

Salinity is calculated using the specific conductance field measurement, the last measurement before sampling.

TABLE 11
Board Order No. R7-2006-0060 WDR Monitoring Information for Groundwater Samples, Second Half 2010
PG&E Topock Compliance Monitoring Program

Location	Sample ID	Sampler Name	Sample Date	Sample Time	Lab	Analysis Method	Parameter	Analysis Date	Lab Technician	Units	Result	RL	MDL
CW-01D	CW-01D-024	Barry Collom	10/6/2010	8:45:00 AM	TLI	EPA 120.1	SC	10/15/2010	Iordan Stavrev	µmhos/cm	7380	2.0	0.038
					TLI	EPA 200.7	BD	10/14/2010	Ethel Suico	mg/L	0.939	0.20	0.025
					TLI	EPA 200.7	CAD	10/14/2010	Ethel Suico	mg/L	178	50.0	5.49
					TLI	EPA 200.7	FETD	10/14/2010	Ethel Suico	mg/L	ND (0.02)	0.02	0.003
					TLI	EPA 200.7	KD	10/14/2010	Ethel Suico	mg/L	14.5	1.00	0.132
					TLI	EPA 200.7	MGD	10/14/2010	Ethel Suico	mg/L	17.6	1.00	0.038
					TLI	EPA 200.7	NAD	10/14/2010	Ethel Suico	mg/L	1320	100	4.40
					TLI	EPA 200.8	AGD	10/12/2010	Hope Trinidad	µg/L	ND (5.0)	5.0	0.20
					TLI	EPA 200.8	ALD	10/12/2010	Hope Trinidad	µg/L	ND (50)	50.0	6.00
					TLI	EPA 200.8	ASD	10/12/2010	Hope Trinidad	µg/L	1.90	1.0	0.26
					TLI	EPA 200.8	BAD	10/12/2010	Hope Trinidad	µg/L	23.4	10.0	0.185
					TLI	EPA 200.8	BED	10/12/2010	Hope Trinidad	µg/L	ND (1.0)	1.0	0.11
					TLI	EPA 200.8	CDD	10/12/2010	Hope Trinidad	µg/L	ND (3.0)	3.0	0.125
					TLI	EPA 200.8	COBD	10/12/2010	Hope Trinidad	µg/L	ND (5.0)	5.0	0.00
					TLI	EPA 200.8	CRTD	10/12/2010	Hope Trinidad	µg/L	2.60	1.0	0.095
					TLI	EPA 200.8	CUD	10/12/2010	Hope Trinidad	µg/L	ND (5.0)	5.0	0.305
					TLI	EPA 200.8	HGD	10/15/2010	Hope Trinidad	µg/L	ND (0.2)	0.2	0.025
					TLI	EPA 200.8	MND	10/12/2010	Hope Trinidad	µg/L	ND (10)	10.0	0.21
					TLI	EPA 200.8	MOD	10/12/2010	Hope Trinidad	µg/L	10.4	10.0	0.66
					TLI	EPA 200.8	NID	10/12/2010	Hope Trinidad	µg/L	ND (10)	10.0	0.24
					TLI	EPA 200.8	PBD	10/12/2010	Hope Trinidad	µg/L	ND (10)	10.0	0.095
					TLI	EPA 200.8	SBD	10/15/2010	Hope Trinidad	µg/L	ND (10)	10.0	0.19
					TLI	EPA 200.8	SED	10/12/2010	Hope Trinidad	µg/L	ND (10)	10.0	0.74
					TLI	EPA 200.8	TLD	10/12/2010	Hope Trinidad	µg/L	ND (1.0)	1.0	0.18
					TLI	EPA 200.8	VD	10/12/2010	Hope Trinidad	µg/L	ND (5.0)	5.0	0.10
					TLI	EPA 200.8	ZND	10/12/2010	Hope Trinidad	µg/L	ND (10)	10.0	1.32
					TLI	EPA 218.6	CR6	10/12/2010	Sonya Bersudsky	µg/L	2.20	1.0	0.11
					TLI	EPA 300.0	CL	10/11/2010	Giawad Ghenniwa	mg/L	2210	100	12.0

TABLE 11

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PG&E Topock Compliance Monitoring Program

Location	Sample ID	Sampler Name	Sample Date	Sample Time	Lab	Analysis Method	Parameter	Analysis Date	Lab Technician	Units	Result	RL	MDL
CW-01D	CW-01D-024	Barry Collom	10/6/2010	8:45:00 AM	TLI	EPA 300.0	FL	10/11/2010	Giawad Ghenniwa	mg/L	1.79	0.5	0.06
					TLI	EPA 300.0	SO4	10/11/2010	Giawad Ghenniwa	mg/L	511	12.5	1.00
					TLI	EPA 6010B	FE	10/25/2010	Ethel Suico	mg/L	ND (0.02)	0.02	0.003
					TLI	SM 2320B	ALKB	10/12/2010	Iordan Stavrev	mg/L	68.0	5.0	0.153
					TLI	SM 2320B	ALKC	10/12/2010	Iordan Stavrev	mg/L	ND (5.0)	5.0	0.153
					TLI	SM 2320B	ALKT	10/12/2010	Iordan Stavrev	mg/L	68.0	5.0	1.68
					TLI	SM2130B	TRB	10/8/2010	Iordan Stavrev	NTU	0.557	0.1	0.014
					TLI	SM2540C	TDS	10/11/2010	Jenny Tankunakorn	mg/L	4570	250	0.434
					TLI	SM4500NH3D	NH3N	10/12/2010	Iordan Stavrev	mg/L	ND (0.5)	0.5	0.002
					EMXT	SM4500NO3-E	NO3NO2N	10/20/2010	Mary Jane Mendoza	mg/L	2.12	1.0	0.20
CW-01M	CW-01M-024	Barry Collom	10/6/2010	9:39:44 AM	TLI	EPA 120.1	SC	10/15/2010	Iordan Stavrev	µmhos/cm	7380	2.0	0.038
					TLI	EPA 200.7	BD	10/14/2010	Ethel Suico	mg/L	1.01	0.20	0.025
					TLI	EPA 200.7	CAD	10/14/2010	Ethel Suico	mg/L	139	50.0	5.49
					TLI	EPA 200.7	FETD	10/14/2010	Ethel Suico	mg/L	ND (0.02)	0.02	0.003
					TLI	EPA 200.7	KD	10/14/2010	Ethel Suico	mg/L	13.5	1.00	0.132
					TLI	EPA 200.7	MGD	10/14/2010	Ethel Suico	mg/L	12.5	1.00	0.038
					TLI	EPA 200.7	NAD	10/14/2010	Ethel Suico	mg/L	1380	100	4.40
					TLI	EPA 200.8	AGD	10/12/2010	Hope Trinidad	µg/L	ND (5.0)	5.0	0.20
					TLI	EPA 200.8	ALD	10/12/2010	Hope Trinidad	µg/L	ND (50)	50.0	6.00
					TLI	EPA 200.8	ASD	10/12/2010	Hope Trinidad	µg/L	1.60	1.0	0.26
					TLI	EPA 200.8	BAD	10/12/2010	Hope Trinidad	µg/L	76.6	10.0	0.185
					TLI	EPA 200.8	BED	10/12/2010	Hope Trinidad	µg/L	ND (1.0)	1.0	0.11
					TLI	EPA 200.8	CDD	10/12/2010	Hope Trinidad	µg/L	ND (3.0)	3.0	0.125
					TLI	EPA 200.8	COBD	10/12/2010	Hope Trinidad	µg/L	ND (5.0)	5.0	0.00
					TLI	EPA 200.8	CRTD	10/12/2010	Hope Trinidad	µg/L	3.60	1.0	0.095
					TLI	EPA 200.8	CUD	10/12/2010	Hope Trinidad	µg/L	ND (5.0)	5.0	0.305
					TLI	EPA 200.8	HGD	10/15/2010	Hope Trinidad	µg/L	ND (0.2)	0.2	0.025

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Location	Sample ID	Sampler Name	Sample Date	Sample Time	Lab	Analysis Method	Parameter	Analysis Date	Lab Technician	Units	Result	RL	MDL
CW-01M	CW-01M-024	Barry Collom	10/6/2010	9:39:44 AM	TLI	EPA 200.8	MND	10/12/2010	Hope Trinidad	µg/L	ND (10)	10.0	0.21
					TLI	EPA 200.8	MOD	10/12/2010	Hope Trinidad	µg/L	10.2	10.0	0.66
					TLI	EPA 200.8	NID	10/12/2010	Hope Trinidad	µg/L	ND (10)	10.0	0.24
					TLI	EPA 200.8	PBD	10/12/2010	Hope Trinidad	µg/L	ND (10)	10.0	0.095
					TLI	EPA 200.8	SBD	10/15/2010	Hope Trinidad	µg/L	ND (10)	10.0	0.19
					TLI	EPA 200.8	SED	10/12/2010	Hope Trinidad	µg/L	ND (10)	10.0	0.74
					TLI	EPA 200.8	TLD	10/12/2010	Hope Trinidad	µg/L	ND (1.0)	1.0	0.18
					TLI	EPA 200.8	VD	10/12/2010	Hope Trinidad	µg/L	ND (5.0)	5.0	0.10
					TLI	EPA 200.8	ZND	10/12/2010	Hope Trinidad	µg/L	ND (10)	10.0	1.32
					TLI	EPA 218.6	CR6	10/12/2010	Sonya Bersudsky	µg/L	3.80	1.0	0.11
					TLI	EPA 300.0	CL	10/11/2010	Giawad Ghenniwa	mg/L	2120	100	12.0
					TLI	EPA 300.0	FL	10/11/2010	Giawad Ghenniwa	mg/L	1.65	0.5	0.06
					TLI	EPA 300.0	SO4	10/11/2010	Giawad Ghenniwa	mg/L	507	50.0	4.00
					TLI	EPA 6010B	FE	10/25/2010	Ethel Suico	mg/L	ND (0.02)	0.02	0.003
					TLI	SM 2320B	ALKB	10/12/2010	Iordan Stavrev	mg/L	71.0	5.0	0.153
					TLI	SM 2320B	ALKC	10/12/2010	Iordan Stavrev	mg/L	ND (5.0)	5.0	0.153
					TLI	SM 2320B	ALKT	10/12/2010	Iordan Stavrev	mg/L	71.0	5.0	1.68
					TLI	SM2130B	TRB	10/8/2010	Iordan Stavrev	NTU	0.318	0.1	0.014
					TLI	SM2540C	TDS	10/11/2010	Jenny Tankunakorn	mg/L	4580	250	0.434
					TLI	SM4500NH3D	NH3N	10/12/2010	Iordan Stavrev	mg/L	ND (0.5)	0.5	0.002
					EMXT	SM4500NO3-E	NO3NO2N	10/20/2010	Mary Jane Mendoza	mg/L	1.87	1.0	0.20
CW-02D	CW-02D-024	Barry Collom	10/4/2010	12:41:25 PM	TLI	EPA 120.1	SC	10/6/2010	Iordan Stavrev	µmhos/cm	7190	2.0	0.038
					TLI	EPA 200.7	BD	10/14/2010	Ethel Suico	mg/L	1.24	0.20	0.025
					TLI	EPA 200.7	CAD	10/14/2010	Ethel Suico	mg/L	71.5	50.0	5.49
					TLI	EPA 200.7	FETD	10/14/2010	Ethel Suico	mg/L	ND (0.02)	0.02	0.003
					TLI	EPA 200.7	KD	10/14/2010	Ethel Suico	mg/L	12.0	1.00	0.132
					TLI	EPA 200.7	MGD	10/14/2010	Ethel Suico	mg/L	4.16	1.00	0.038

TABLE 11

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Location	Sample ID	Sampler Name	Sample Date	Sample Time	Lab	Analysis Method	Parameter	Analysis Date	Lab Technician	Units	Result	RL	MDL
CW-02D	CW-02D-024	Barry Collom	10/4/2010	12:41:25 PM	TLI	EPA 200.7	NAD	10/14/2010	Ethel Suico	mg/L	1440	100	4.40
					TLI	EPA 200.8	AGD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (5.0)	5.0	0.20
					TLI	EPA 200.8	ALD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	52.0	50.0	6.00
					TLI	EPA 200.8	ASD	10/14/2010	Daniel Kang/Hope Trinidad	µg/L	3.50	1.0	0.26
					TLI	EPA 200.8	BAD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (10)	10.0	0.185
					TLI	EPA 200.8	BED	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (1.0)	1.0	0.11
					TLI	EPA 200.8	CDD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (3.0)	3.0	0.125
					TLI	EPA 200.8	COBD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (5.0)	5.0	0.00
					TLI	EPA 200.8	CRTD	10/12/2010	Daniel Kang/Hope Trinidad	µg/L	1.80	1.0	0.095
					TLI	EPA 200.8	CUD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (5.0)	5.0	0.305
					TLI	EPA 200.8	HGD	10/15/2010	Daniel Kang/Hope Trinidad	µg/L	ND (0.2)	0.2	0.025
					TLI	EPA 200.8	MND	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (10)	10.0	0.21
					TLI	EPA 200.8	MOD	10/12/2010	Daniel Kang/Hope Trinidad	µg/L	11.7	10.0	0.66
					TLI	EPA 200.8	NID	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (10)	10.0	0.24
					TLI	EPA 200.8	PBD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (10)	10.0	0.095
					TLI	EPA 200.8	SBD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (10)	10.0	0.19
					TLI	EPA 200.8	SED	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (10)	10.0	0.74
					TLI	EPA 200.8	TLD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (1.0)	1.0	0.18
					TLI	EPA 200.8	VD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	5.60	5.0	0.10
					TLI	EPA 200.8	ZND	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (10)	10.0	1.32
					TLI	EPA 218.6	CR6	10/8/2010	Sonya Bersudsky	µg/L	0.47	0.2	0.022
					TLI	EPA 300.0	CL	10/7/2010	Giawad Ghenniwa	mg/L	2520	100	12.0
					TLI	EPA 300.0	FL	10/6/2010	Giawad Ghenniwa	mg/L	4.39	0.5	0.06
					TLI	EPA 300.0	SO4	10/7/2010	Giawad Ghenniwa	mg/L	478	12.5	1.00
					TLI	EPA 6010B	FE	10/8/2010	Ethel Suico	mg/L	ND (0.02)	0.02	0.004
					TLI	SM 2320B	ALKB	10/12/2010	Iordan Stavrev	mg/L	69.0	5.0	0.153
					TLI	SM 2320B	ALKC	10/12/2010	Iordan Stavrev	mg/L	ND (5.0)	5.0	0.153
					TLI	SM 2320B	ALKT	10/12/2010	Iordan Stavrev	mg/L	69.0	5.0	1.68

TABLE 11
Board Order No. R7-2006-0060 WDR Monitoring Information for Groundwater Samples, Second Half 2010
PG&E Topock Compliance Monitoring Program

Location	Sample ID	Sampler Name	Sample Date	Sample Time	Lab	Analysis Method	Parameter	Analysis Date	Lab Technician	Units	Result	RL	MDL
CW-02D	CW-02D-024	Barry Collom	10/4/2010	12:41:25 PM	TLI	SM2130B	TRB	10/6/2010	Gautam Savani	NTU	0.291	0.1	0.014
					TLI	SM2540C	TDS	10/7/2010	Jenny Tankunakorn	mg/L	4090	250	0.434
					TLI	SM4500NH3D	NH3N	10/12/2010	Iordan Stavrev	mg/L	ND (0.5)	0.5	0.002
					EMXT	SM4500NO3-E	NO3NO2N	10/12/2010	Mary Jane Mendoza	mg/L	2.96	0.5	0.10
CW-02M	CW-02M-024	Barry Collom	10/4/2010	1:42:47 PM	TLI	EPA 120.1	SC	10/6/2010	Iordan Stavrev	µmhos/cm	7140	2.0	0.038
					TLI	EPA 200.7	BD	10/14/2010	Ethel Suico	mg/L	1.07	0.20	0.025
					TLI	EPA 200.7	CAD	10/14/2010	Ethel Suico	mg/L	130	50.0	5.49
					TLI	EPA 200.7	FETD	10/14/2010	Ethel Suico	mg/L	ND (0.02)	0.02	0.003
					TLI	EPA 200.7	KD	10/14/2010	Ethel Suico	mg/L	13.4	1.00	0.132
					TLI	EPA 200.7	MGD	10/14/2010	Ethel Suico	mg/L	11.0	1.00	0.038
					TLI	EPA 200.7	NAD	10/14/2010	Ethel Suico	mg/L	1300	100	4.40
					TLI	EPA 200.8	AGD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (5.0)	5.0	0.20
					TLI	EPA 200.8	ALD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (50)	50.0	6.00
					TLI	EPA 200.8	ASD	10/14/2010	Daniel Kang/Hope Trinidad	µg/L	2.20	1.0	0.26
					TLI	EPA 200.8	BAD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	59.9	10.0	0.185
					TLI	EPA 200.8	BED	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (1.0)	1.0	0.11
					TLI	EPA 200.8	CDD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (3.0)	3.0	0.125
					TLI	EPA 200.8	COBD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (5.0)	5.0	0.00
					TLI	EPA 200.8	CRTD	10/12/2010	Daniel Kang/Hope Trinidad	µg/L	4.20	1.0	0.095
					TLI	EPA 200.8	CUD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (5.0)	5.0	0.305
					TLI	EPA 200.8	HGD	10/15/2010	Daniel Kang/Hope Trinidad	µg/L	ND (0.2)	0.2	0.025
					TLI	EPA 200.8	MND	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (10)	10.0	0.21
					TLI	EPA 200.8	MOD	10/12/2010	Daniel Kang/Hope Trinidad	µg/L	18.4	10.0	0.66
					TLI	EPA 200.8	NID	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (10)	10.0	0.24
					TLI	EPA 200.8	PBD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (10)	10.0	0.095
					TLI	EPA 200.8	SBD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (10)	10.0	0.19
					TLI	EPA 200.8	SED	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (10)	10.0	0.74

TABLE 11

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PG&E Topock Compliance Monitoring Program

Location	Sample ID	Sampler Name	Sample Date	Sample Time	Lab	Analysis Method	Parameter	Analysis Date	Lab Technician	Units	Result	RL	MDL
CW-02M	CW-02M-024	Barry Collom	10/4/2010	1:42:47 PM	TLI	EPA 200.8	TLD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (1.0)	1.0	0.18
					TLI	EPA 200.8	VD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (5.0)	5.0	0.10
					TLI	EPA 200.8	ZND	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (10)	10.0	1.32
					TLI	EPA 218.6	CR6	10/8/2010	Sonya Bersudsky	µg/L	4.30	1.0	0.11
					TLI	EPA 300.0	CL	10/7/2010	Giawad Ghenniwa	mg/L	2830	100	12.0
					TLI	EPA 300.0	FL	10/6/2010	Giawad Ghenniwa	mg/L	2.87	0.5	0.06
					TLI	EPA 300.0	SO4	10/7/2010	Giawad Ghenniwa	mg/L	440	12.5	1.00
					TLI	EPA 6010B	FE	10/8/2010	Ethel Suico	mg/L	ND (0.02)	0.02	0.004
					TLI	SM 2320B	ALKB	10/12/2010	Iordan Stavrev	mg/L	52.0	5.0	0.153
					TLI	SM 2320B	ALKC	10/12/2010	Iordan Stavrev	mg/L	ND (5.0)	5.0	0.153
					TLI	SM 2320B	ALKT	10/12/2010	Iordan Stavrev	mg/L	52.0	5.0	1.68
					TLI	SM2130B	TRB	10/6/2010	Gautam Savani	NTU	0.251	0.1	0.014
					TLI	SM2540C	TDS	10/7/2010	Jenny Tankunakorn	mg/L	4300	250	0.434
					TLI	SM4500NH3D	NH3N	10/12/2010	Iordan Stavrev	mg/L	ND (0.5)	0.5	0.002
					EMXT	SM4500NO3-E	NO3NO2N	10/12/2010	Mary Jane Mendoza	mg/L	2.52	0.5	0.10
CW-03D	CW-03D-024	Barry Collom	10/4/2010	3:38:55 PM	TLI	EPA 120.1	SC	10/6/2010	Iordan Stavrev	µmhos/cm	7220	2.0	0.038
					TLI	EPA 200.7	BD	10/14/2010	Ethel Suico	mg/L	1.33	0.20	0.025
					TLI	EPA 200.7	CAD	10/14/2010	Ethel Suico	mg/L	69.2	50.0	5.49
					TLI	EPA 200.7	FETD	10/14/2010	Ethel Suico	mg/L	ND (0.02)	0.02	0.003
					TLI	EPA 200.7	KD	10/14/2010	Ethel Suico	mg/L	13.0	1.00	0.132
					TLI	EPA 200.7	MGD	10/14/2010	Ethel Suico	mg/L	5.75	1.00	0.038
					TLI	EPA 200.7	NAD	10/14/2010	Ethel Suico	mg/L	1430	100	4.40
					TLI	EPA 200.8	AGD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (5.0)	5.0	0.20
					TLI	EPA 200.8	ALD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (50)	50.0	6.00
					TLI	EPA 200.8	ASD	10/14/2010	Daniel Kang/Hope Trinidad	µg/L	1.40	1.0	0.26
					TLI	EPA 200.8	BAD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	10.3	10.0	0.185
					TLI	EPA 200.8	BED	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (1.0)	1.0	0.11

TABLE 11
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PG&E Topock Compliance Monitoring Program

Location	Sample ID	Sampler Name	Sample Date	Sample Time	Lab	Analysis Method	Parameter	Analysis Date	Lab Technician	Units	Result	RL	MDL
CW-03D	CW-03D-024	Barry Collom	10/4/2010	3:38:55 PM	TLI	EPA 200.8	CDD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (3.0)	3.0	0.125
					TLI	EPA 200.8	COBD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (5.0)	5.0	0.00
					TLI	EPA 200.8	CRTD	10/12/2010	Daniel Kang/Hope Trinidad	µg/L	ND (1.0)	1.0	0.095
					TLI	EPA 200.8	CUD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (5.0)	5.0	0.305
					TLI	EPA 200.8	HGD	10/15/2010	Daniel Kang/Hope Trinidad	µg/L	ND (0.2)	0.2	0.025
					TLI	EPA 200.8	MND	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (10)	10.0	0.21
					TLI	EPA 200.8	MOD	10/12/2010	Daniel Kang/Hope Trinidad	µg/L	29.8	10.0	0.66
					TLI	EPA 200.8	NID	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (10)	10.0	0.24
					TLI	EPA 200.8	PBD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (10)	10.0	0.095
					TLI	EPA 200.8	SBD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (10)	10.0	0.19
					TLI	EPA 200.8	SED	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (10)	10.0	0.74
					TLI	EPA 200.8	TLD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (1.0)	1.0	0.18
					TLI	EPA 200.8	VD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (5.0)	5.0	0.10
					TLI	EPA 200.8	ZND	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (10)	10.0	1.32
					TLI	EPA 218.6	CR6	10/8/2010	Sonya Bersudsky	µg/L	0.40	0.2	0.022
					TLI	EPA 300.0	CL	10/7/2010	Giawad Ghenniwa	mg/L	2060	100	12.0
					TLI	EPA 300.0	FL	10/6/2010	Giawad Ghenniwa	mg/L	5.71	0.5	0.06
					TLI	EPA 300.0	SO4	10/7/2010	Giawad Ghenniwa	mg/L	475	12.5	1.00
					TLI	EPA 6010B	FE	10/8/2010	Ethel Suico	mg/L	ND (0.02)	0.02	0.004
					TLI	SM 2320B	ALKB	10/12/2010	Iordan Stavrev	mg/L	65.0	5.0	0.153
					TLI	SM 2320B	ALKC	10/12/2010	Iordan Stavrev	mg/L	ND (5.0)	5.0	0.153
					TLI	SM 2320B	ALKT	10/12/2010	Iordan Stavrev	mg/L	65.0	5.0	1.68
					TLI	SM2130B	TRB	10/6/2010	Gautam Savani	NTU	0.14	0.1	0.014
					TLI	SM2540C	TDS	10/7/2010	Jenny Tankunakorn	mg/L	4360	250	0.434
					TLI	SM4500NH3D	NH3N	10/12/2010	Iordan Stavrev	mg/L	ND (0.5)	0.5	0.002
					EMXT	SM4500NO3-E	NO3NO2N	10/12/2010	Mary Jane Mendoza	mg/L	2.58	0.5	0.10
CW-03M	CW-03M-024	Barry Collom	10/5/2010	9:11:50 AM	TLI	EPA 120.1	SC	10/6/2010	Iordan Stavrev	µmhos/cm	8630	2.0	0.038

TABLE 11

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Location	Sample ID	Sampler Name	Sample Date	Sample Time	Lab	Analysis Method	Parameter	Analysis Date	Lab Technician	Units	Result	RL	MDL
CW-03M	CW-03M-024	Barry Collom	10/5/2010	9:11:50 AM	TLI	EPA 200.7	BD	10/14/2010	Ethel Suico	mg/L	1.03	0.20	0.025
					TLI	EPA 200.7	CAD	10/14/2010	Ethel Suico	mg/L	207	50.0	5.49
					TLI	EPA 200.7	FETD	10/14/2010	Ethel Suico	mg/L	ND (0.02)	0.02	0.003
					TLI	EPA 200.7	KD	10/14/2010	Ethel Suico	mg/L	17.0	1.00	0.132
					TLI	EPA 200.7	MGD	10/14/2010	Ethel Suico	mg/L	17.9	1.00	0.038
					TLI	EPA 200.7	NAD	10/14/2010	Ethel Suico	mg/L	1580	100	4.40
					TLI	EPA 200.8	AGD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (5.0)	5.0	0.20
					TLI	EPA 200.8	ALD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (50)	50.0	6.00
					TLI	EPA 200.8	ASD	10/14/2010	Daniel Kang/Hope Trinidad	µg/L	1.20	1.0	0.26
					TLI	EPA 200.8	BAD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	46.1	10.0	0.185
					TLI	EPA 200.8	BED	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (1.0)	1.0	0.11
					TLI	EPA 200.8	CDD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (3.0)	3.0	0.125
					TLI	EPA 200.8	COBD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (5.0)	5.0	0.00
					TLI	EPA 200.8	CRTD	10/12/2010	Daniel Kang/Hope Trinidad	µg/L	9.70	1.0	0.095
					TLI	EPA 200.8	CUD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (5.0)	5.0	0.305
					TLI	EPA 200.8	HGD	10/15/2010	Daniel Kang/Hope Trinidad	µg/L	ND (0.2)	0.2	0.025
					TLI	EPA 200.8	MND	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (10)	10.0	0.21
					TLI	EPA 200.8	MOD	10/12/2010	Daniel Kang/Hope Trinidad	µg/L	19.0	10.0	0.66
					TLI	EPA 200.8	NID	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (10)	10.0	0.24
					TLI	EPA 200.8	PBD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (10)	10.0	0.095
					TLI	EPA 200.8	SBD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (10)	10.0	0.19
					TLI	EPA 200.8	SED	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (10)	10.0	0.74
					TLI	EPA 200.8	TLD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (1.0)	1.0	0.18
					TLI	EPA 200.8	VD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (5.0)	5.0	0.10
					TLI	EPA 200.8	ZND	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (10)	10.0	1.32
					TLI	EPA 218.6	CR6	10/8/2010	Sonya Bersudsky	µg/L	9.80	1.0	0.11
					TLI	EPA 300.0	CL	10/7/2010	Giawad Ghenniwa	mg/L	2680	100	12.0
					TLI	EPA 300.0	FL	10/6/2010	Giawad Ghenniwa	mg/L	2.76	0.5	0.06

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PG&E Topock Compliance Monitoring Program

Location	Sample ID	Sampler Name	Sample Date	Sample Time	Lab	Analysis Method	Parameter	Analysis Date	Lab Technician	Units	Result	RL	MDL
CW-03M	CW-03M-024	Barry Collom	10/5/2010	9:11:50 AM	TLI	EPA 300.0	SO4	10/7/2010	Giawad Ghenniwa	mg/L	427	12.5	1.00
					TLI	EPA 6010B	FE	10/8/2010	Ethel Suico	mg/L	ND (0.02)	0.02	0.004
					TLI	SM 2320B	ALKB	10/12/2010	Iordan Stavrev	mg/L	48.0	5.0	0.153
					TLI	SM 2320B	ALKC	10/12/2010	Iordan Stavrev	mg/L	ND (5.0)	5.0	0.153
					TLI	SM 2320B	ALKT	10/12/2010	Iordan Stavrev	mg/L	48.0	5.0	1.68
					TLI	SM2130B	TRB	10/6/2010	Gautam Savani	NTU	0.373 J	0.1	0.014
					TLI	SM2540C	TDS	10/7/2010	Jenny Tankunakorn	mg/L	5820	250	0.434
					TLI	SM4500NH3D	NH3N	10/12/2010	Iordan Stavrev	mg/L	ND (0.5)	0.5	0.002
					EMXT	SM4500NO3-E	NO3NO2N	10/12/2010	Mary Jane Mendoza	mg/L	0.641	0.5	0.10
CW-03M	OW-90-024	Barry Collom	10/5/2010	9:14:05 AM	TLI	EPA 120.1	SC	10/6/2010	Iordan Stavrev	µmhos/cm	8540	2.0	0.038
					TLI	EPA 200.7	BD	10/14/2010	Ethel Suico	mg/L	1.04	0.20	0.025
					TLI	EPA 200.7	CAD	10/14/2010	Ethel Suico	mg/L	203	50.0	5.49
					TLI	EPA 200.7	FETD	10/14/2010	Ethel Suico	mg/L	ND (0.02)	0.02	0.003
					TLI	EPA 200.7	KD	10/14/2010	Ethel Suico	mg/L	16.8	1.00	0.132
					TLI	EPA 200.7	MGD	10/14/2010	Ethel Suico	mg/L	18.0	1.00	0.038
					TLI	EPA 200.7	NAD	10/14/2010	Ethel Suico	mg/L	1560	100	4.40
					TLI	EPA 200.8	AGD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (5.0)	5.0	0.20
					TLI	EPA 200.8	ALD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (50)	50.0	6.00
					TLI	EPA 200.8	ASD	10/14/2010	Daniel Kang/Hope Trinidad	µg/L	ND (1.0)	1.0	0.26
					TLI	EPA 200.8	BAD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	46.1	10.0	0.185
					TLI	EPA 200.8	BED	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (1.0)	1.0	0.11
					TLI	EPA 200.8	CDD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (3.0)	3.0	0.125
					TLI	EPA 200.8	COBD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (5.0)	5.0	0.00
					TLI	EPA 200.8	CRTD	10/12/2010	Daniel Kang/Hope Trinidad	µg/L	9.60	1.0	0.095
					TLI	EPA 200.8	CUD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (5.0)	5.0	0.305
					TLI	EPA 200.8	HGD	10/15/2010	Daniel Kang/Hope Trinidad	µg/L	ND (0.2)	0.2	0.025
					TLI	EPA 200.8	MND	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (10)	10.0	0.21

TABLE 11
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Location	Sample ID	Sampler Name	Sample Date	Sample Time	Lab	Analysis Method	Parameter	Analysis Date	Lab Technician	Units	Result	RL	MDL
CW-03M	OW-90-024	Barry Collom	10/5/2010	9:14:05 AM	TLI	EPA 200.8	MOD	10/12/2010	Daniel Kang/Hope Trinidad	µg/L	17.3	10.0	0.66
					TLI	EPA 200.8	NID	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (10)	10.0	0.24
					TLI	EPA 200.8	PBD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (10)	10.0	0.095
					TLI	EPA 200.8	SBD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (10)	10.0	0.19
					TLI	EPA 200.8	SED	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (10)	10.0	0.74
					TLI	EPA 200.8	TLD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (1.0)	1.0	0.18
					TLI	EPA 200.8	VD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (5.0)	5.0	0.10
					TLI	EPA 200.8	ZND	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (10)	10.0	1.32
					TLI	EPA 218.6	CR6	10/8/2010	Sonya Bersudsky	µg/L	11.1	1.0	0.11
					TLI	EPA 300.0	CL	10/7/2010	Giawad Ghenniwa	mg/L	2660	100	12.0
					TLI	EPA 300.0	FL	10/6/2010	Giawad Ghenniwa	mg/L	2.64	0.5	0.06
					TLI	EPA 300.0	SO4	10/7/2010	Giawad Ghenniwa	mg/L	427	12.5	1.00
					TLI	EPA 6010B	FE	10/8/2010	Ethel Suico	mg/L	ND (0.02)	0.02	0.004
					TLI	SM 2320B	ALKB	10/12/2010	Iordan Stavrev	mg/L	50.0	5.0	0.153
					TLI	SM 2320B	ALKC	10/12/2010	Iordan Stavrev	mg/L	ND (5.0)	5.0	0.153
					TLI	SM 2320B	ALKT	10/12/2010	Iordan Stavrev	mg/L	50.0	5.0	1.68
					TLI	SM2130B	TRB	10/6/2010	Gautam Savani	NTU	0.161 J	0.1	0.014
					TLI	SM2540C	TDS	10/7/2010	Jenny Tankunakorn	mg/L	5720	250	0.434
					TLI	SM4500NH3D	NH3N	10/12/2010	Iordan Stavrev	mg/L	ND (0.5)	0.5	0.002
					EMXT	SM4500NO3-E	NO3NO2N	10/12/2010	Mary Jane Mendoza	mg/L	1.17	1.0	0.20
CW-04D	CW-04D-024	Barry Collom	10/5/2010	10:51:57 AM	TLI	EPA 120.1	SC	10/6/2010	Iordan Stavrev	µmhos/cm	8190	2.0	0.038
					TLI	EPA 200.7	BD	10/14/2010	Ethel Suico	mg/L	1.24	0.20	0.025
					TLI	EPA 200.7	CAD	10/14/2010	Ethel Suico	mg/L	121	50.0	5.49
					TLI	EPA 200.7	FETD	10/14/2010	Ethel Suico	mg/L	ND (0.02)	0.02	0.003
					TLI	EPA 200.7	KD	10/14/2010	Ethel Suico	mg/L	14.0	1.00	0.132
					TLI	EPA 200.7	MGD	10/14/2010	Ethel Suico	mg/L	8.85	1.00	0.038
					TLI	EPA 200.7	NAD	10/14/2010	Ethel Suico	mg/L	1580	100	4.40

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Location	Sample ID	Sampler Name	Sample Date	Sample Time	Lab	Analysis Method	Parameter	Analysis Date	Lab Technician	Units	Result	RL	MDL
CW-04D	CW-04D-024	Barry Collom	10/5/2010	10:51:57 AM	TLI	EPA 200.8	AGD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (5.0)	5.0	0.20
					TLI	EPA 200.8	ALD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (50)	50.0	6.00
					TLI	EPA 200.8	ASD	10/14/2010	Daniel Kang/Hope Trinidad	µg/L	3.60	1.0	0.26
					TLI	EPA 200.8	BAD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	20.7	10.0	0.185
					TLI	EPA 200.8	BED	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (1.0)	1.0	0.11
					TLI	EPA 200.8	CDD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (3.0)	3.0	0.125
					TLI	EPA 200.8	COBD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (5.0)	5.0	0.00
					TLI	EPA 200.8	CRTD	10/12/2010	Daniel Kang/Hope Trinidad	µg/L	1.60	1.0	0.095
					TLI	EPA 200.8	CUD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (5.0)	5.0	0.305
					TLI	EPA 200.8	HGD	10/15/2010	Daniel Kang/Hope Trinidad	µg/L	ND (0.2)	0.2	0.025
					TLI	EPA 200.8	MND	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (10)	10.0	0.21
					TLI	EPA 200.8	MOD	10/12/2010	Daniel Kang/Hope Trinidad	µg/L	21.6	10.0	0.66
					TLI	EPA 200.8	NID	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (10)	10.0	0.24
					TLI	EPA 200.8	PBD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (10)	10.0	0.095
					TLI	EPA 200.8	SBD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (10)	10.0	0.19
					TLI	EPA 200.8	SED	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (10)	10.0	0.74
					TLI	EPA 200.8	TLD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (1.0)	1.0	0.18
					TLI	EPA 200.8	VD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (5.0)	5.0	0.10
					TLI	EPA 200.8	ZND	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (10)	10.0	1.32
					TLI	EPA 218.6	CR6	10/8/2010	Sonya Bersudsky	µg/L	1.90	1.0	0.11
					TLI	EPA 300.0	CL	10/7/2010	Giawad Ghenniwa	mg/L	2420	100	12.0
					TLI	EPA 300.0	FL	10/6/2010	Giawad Ghenniwa	mg/L	3.86	0.5	0.06
					TLI	EPA 300.0	SO4	10/7/2010	Giawad Ghenniwa	mg/L	505	12.5	1.00
					TLI	EPA 6010B	FE	10/8/2010	Ethel Suico	mg/L	ND (0.02)	0.02	0.004
					TLI	SM 2320B	ALKB	10/12/2010	Iordan Stavrev	mg/L	61.0	5.0	0.153
					TLI	SM 2320B	ALKC	10/12/2010	Iordan Stavrev	mg/L	ND (5.0)	5.0	0.153
					TLI	SM 2320B	ALKT	10/12/2010	Iordan Stavrev	mg/L	61.0	5.0	1.68
					TLI	SM2130B	TRB	10/6/2010	Gautam Savani	NTU	0.175	0.1	0.014

TABLE 11
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Location	Sample ID	Sampler Name	Sample Date	Sample Time	Lab	Analysis Method	Parameter	Analysis Date	Lab Technician	Units	Result	RL	MDL
CW-04D	CW-04D-024	Barry Collom	10/5/2010	10:51:57 AM	TLI	SM2540C	TDS	10/7/2010	Jenny Tankunakorn	mg/L	5060	250	0.434
					TLI	SM4500NH3D	NH3N	10/12/2010	Iordan Stavrev	mg/L	ND (0.5)	0.5	0.002
					EMXT	SM4500NO3-E	NO3NO2N	10/12/2010	Mary Jane Mendoza	mg/L	1.90	1.0	0.20
CW-04M	CW-04M-024	Barry Collom	10/5/2010	12:11:35 PM	TLI	EPA 120.1	SC	10/6/2010	Iordan Stavrev	µmhos/cm	6610	2.0	0.038
					TLI	EPA 200.7	BD	10/14/2010	Ethel Suico	mg/L	0.812	0.20	0.025
					TLI	EPA 200.7	CAD	10/14/2010	Ethel Suico	mg/L	156	50.0	5.49
					TLI	EPA 200.7	FETD	10/14/2010	Ethel Suico	mg/L	ND (0.02)	0.02	0.003
					TLI	EPA 200.7	KD	10/14/2010	Ethel Suico	mg/L	13.6	1.00	0.132
					TLI	EPA 200.7	MGD	10/14/2010	Ethel Suico	mg/L	14.3	1.00	0.038
					TLI	EPA 200.7	NAD	10/14/2010	Ethel Suico	mg/L	1120	100	4.40
					TLI	EPA 200.8	AGD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (5.0)	5.0	0.20
					TLI	EPA 200.8	ALD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (50)	50.0	6.00
					TLI	EPA 200.8	ASD	10/14/2010	Daniel Kang/Hope Trinidad	µg/L	3.00	1.0	0.26
					TLI	EPA 200.8	BAD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	79.9	10.0	0.185
					TLI	EPA 200.8	BED	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (1.0)	1.0	0.11
					TLI	EPA 200.8	CDD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (3.0)	3.0	0.125
					TLI	EPA 200.8	COBD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (5.0)	5.0	0.00
					TLI	EPA 200.8	CRTD	10/12/2010	Daniel Kang/Hope Trinidad	µg/L	11.8	1.0	0.095
					TLI	EPA 200.8	CUD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (5.0)	5.0	0.305
					TLI	EPA 200.8	HGD	10/15/2010	Daniel Kang/Hope Trinidad	µg/L	ND (0.2)	0.2	0.025
					TLI	EPA 200.8	MND	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (10)	10.0	0.21
					TLI	EPA 200.8	MOD	10/12/2010	Daniel Kang/Hope Trinidad	µg/L	ND (10)	10.0	0.66
					TLI	EPA 200.8	NID	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (10)	10.0	0.24
					TLI	EPA 200.8	PBD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (10)	10.0	0.095
					TLI	EPA 200.8	SBD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (10)	10.0	0.19
					TLI	EPA 200.8	SED	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (10)	10.0	0.74
					TLI	EPA 200.8	TLD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (1.0)	1.0	0.18

TABLE 11

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Location	Sample ID	Sampler Name	Sample Date	Sample Time	Lab	Analysis Method	Parameter	Analysis Date	Lab Technician	Units	Result	RL	MDL
CW-04M	CW-04M-024	Barry Collom	10/5/2010	12:11:35 PM	TLI	EPA 200.8	VD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (5.0)	5.0	0.10
					TLI	EPA 200.8	ZND	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (10)	10.0	1.32
					TLI	EPA 218.6	CR6	10/8/2010	Sonya Bersudsky	µg/L	13.7	0.2	0.022
					TLI	EPA 300.0	CL	10/7/2010	Giawad Ghenniwa	mg/L	2060	100	12.0
					TLI	EPA 300.0	FL	10/6/2010	Giawad Ghenniwa	mg/L	1.88	0.5	0.06
					TLI	EPA 300.0	SO4	10/7/2010	Giawad Ghenniwa	mg/L	361	12.5	1.00
					TLI	EPA 6010B	FE	10/8/2010	Ethel Suico	mg/L	ND (0.02)	0.02	0.004
					TLI	SM 2320B	ALKB	10/12/2010	Iordan Stavrev	mg/L	54.0	5.0	0.153
					TLI	SM 2320B	ALKC	10/12/2010	Iordan Stavrev	mg/L	ND (5.0)	5.0	0.153
					TLI	SM 2320B	ALKT	10/12/2010	Iordan Stavrev	mg/L	54.0	5.0	1.68
					TLI	SM2130B	TRB	10/6/2010	Gautam Savani	NTU	0.26	0.1	0.014
					TLI	SM2540C	TDS	10/7/2010	Jenny Tankunakorn	mg/L	4380	125	0.434
					TLI	SM4500NH3D	NH3N	10/12/2010	Iordan Stavrev	mg/L	ND (0.5)	0.5	0.002
					EMXT	SM4500NO3-E	NO3NO2N	10/12/2010	Mary Jane Mendoza	mg/L	1.30	0.5	0.10
OW-01D	OW-01D-024	Barry Collom	10/1/2010	9:17:40 AM	TLI	EPA 120.1	SC	10/4/2010	Iordan Stavrev	µmhos/cm	7320	2.0	0.038
					TLI	EPA 200.8	CRTD	10/11/2010	Daniel Kang	µg/L	2.90	1.0	0.095
					TLI	EPA 218.6	CR6	10/5/2010	Sonya Bersudsky	µg/L	2.30	1.0	0.11
					TLI	EPA 300.0	CL	10/2/2010	Giawad Ghenniwa	mg/L	1990	100	12.0
					TLI	EPA 300.0	FL	10/2/2010	Giawad Ghenniwa	mg/L	1.93	0.5	0.06
					TLI	EPA 300.0	SO4	10/5/2010	Giawad Ghenniwa	mg/L	513	12.5	1.00
					TLI	SM2130B	TRB	10/2/2010	Kim Luck	NTU	0.372	0.1	0.014
					TLI	SM2540C	TDS	10/4/2010	Jenny Tankunakorn	mg/L	3790	250	0.434
					EMXT	SM4500NO3-E	NO3NO2N	10/12/2010	Mary Jane Mendoza	mg/L	2.87	0.5	0.10
OW-01M	OW-01M-024	Barry Collom	10/1/2010	9:55:33 AM	TLI	EPA 120.1	SC	10/4/2010	Iordan Stavrev	µmhos/cm	7250	2.0	0.038
					TLI	EPA 200.8	CRTD	10/11/2010	Daniel Kang	µg/L	4.30	1.0	0.095
					TLI	EPA 218.6	CR6	10/5/2010	Sonya Bersudsky	µg/L	3.60	1.0	0.11
					TLI	EPA 300.0	CL	10/2/2010	Giawad Ghenniwa	mg/L	2110	100	12.0

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Location	Sample ID	Sampler Name	Sample Date	Sample Time	Lab	Analysis Method	Parameter	Analysis Date	Lab Technician	Units	Result	RL	MDL
OW-01M	OW-01M-024	Barry Collom	10/1/2010	9:55:33 AM	TLI	EPA 300.0	FL	10/2/2010	Giawad Ghenniwa	mg/L	2.17	0.5	0.06
					TLI	EPA 300.0	SO4	10/5/2010	Giawad Ghenniwa	mg/L	507	12.5	1.00
					TLI	SM2130B	TRB	10/2/2010	Kim Luck	NTU	0.125	0.1	0.014
					TLI	SM2540C	TDS	10/4/2010	Jenny Tankunakorn	mg/L	4680	250	0.434
					EMXT	SM4500NO3-E	NO3NO2N	10/12/2010	Mary Jane Mendoza	mg/L	3.12	0.5	0.10
OW-01S	OW-01S-024	Barry Collom	10/1/2010	10:28:34 AM	TLI	EPA 120.1	SC	10/4/2010	Iordan Stavrev	µmhos/cm	3780	2.0	0.038
					TLI	EPA 200.8	CRTD	10/11/2010	Daniel Kang	µg/L	17.6	1.0	0.095
					TLI	EPA 218.6	CR6	10/5/2010	Sonya Bersudsky	µg/L	18.3	0.2	0.022
					TLI	EPA 300.0	CL	10/2/2010	Giawad Ghenniwa	mg/L	1070	100	12.0
					TLI	EPA 300.0	FL	10/2/2010	Giawad Ghenniwa	mg/L	2.10	0.5	0.06
					TLI	EPA 300.0	SO4	10/5/2010	Giawad Ghenniwa	mg/L	216	5.0	0.40
					TLI	SM2130B	TRB	10/2/2010	Kim Luck	NTU	2.26 J	0.1	0.014
					TLI	SM2540C	TDS	10/4/2010	Jenny Tankunakorn	mg/L	2300	50.0	0.434
					EMXT	SM4500NO3-E	NO3NO2N	10/12/2010	Mary Jane Mendoza	mg/L	3.09	0.5	0.10
OW-01S	OW-91-024	Barry Collom	10/1/2010	11:09:02 AM	TLI	EPA 120.1	SC	10/4/2010	Iordan Stavrev	µmhos/cm	3670	2.0	0.038
					TLI	EPA 200.8	CRTD	10/11/2010	Daniel Kang	µg/L	17.6	1.0	0.095
					TLI	EPA 218.6	CR6	10/5/2010	Sonya Bersudsky	µg/L	18.3	0.2	0.022
					TLI	EPA 300.0	CL	10/2/2010	Giawad Ghenniwa	mg/L	1150	100	12.0
					TLI	EPA 300.0	FL	10/2/2010	Giawad Ghenniwa	mg/L	2.03	0.5	0.06
					TLI	EPA 300.0	SO4	10/5/2010	Giawad Ghenniwa	mg/L	243	5.0	0.40
					TLI	SM2130B	TRB	10/2/2010	Kim Luck	NTU	3.57 J	0.1	0.014
					TLI	SM2540C	TDS	10/4/2010	Jenny Tankunakorn	mg/L	2540	50.0	0.434
					EMXT	SM4500NO3-E	NO3NO2N	10/12/2010	Mary Jane Mendoza	mg/L	3.42	0.5	0.10
OW-02D	OW-02D-024	Barry Collom	10/5/2010	2:11:00 PM	TLI	EPA 120.1	SC	10/6/2010	Iordan Stavrev	µmhos/cm	7270	2.0	0.038
					TLI	EPA 200.7	BD	10/14/2010	Ethel Suico	mg/L	0.962	0.20	0.025
					TLI	EPA 200.7	CAD	10/14/2010	Ethel Suico	mg/L	131	50.0	5.49
					TLI	EPA 200.7	FETD	10/14/2010	Ethel Suico	mg/L	ND (0.02)	0.02	0.003

TABLE 11

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Location	Sample ID	Sampler Name	Sample Date	Sample Time	Lab	Analysis Method	Parameter	Analysis Date	Lab Technician	Units	Result	RL	MDL
OW-02D	OW-02D-024	Barry Collom	10/5/2010	2:11:00 PM	TLI	EPA 200.7	KD	10/14/2010	Ethel Suico	mg/L	16.0	1.00	0.132
					TLI	EPA 200.7	MGD	10/14/2010	Ethel Suico	mg/L	23.0	2.50	0.095
					TLI	EPA 200.7	NAD	10/14/2010	Ethel Suico	mg/L	1270	100	4.40
					TLI	EPA 200.8	AGD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (5.0)	5.0	0.20
					TLI	EPA 200.8	ALD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (50)	50.0	6.00
					TLI	EPA 200.8	ASD	10/14/2010	Daniel Kang/Hope Trinidad	µg/L	3.90	1.0	0.26
					TLI	EPA 200.8	BAD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	15.3	10.0	0.185
					TLI	EPA 200.8	BED	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (1.0)	1.0	0.11
					TLI	EPA 200.8	CDD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (3.0)	3.0	0.125
					TLI	EPA 200.8	COBD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (5.0)	5.0	0.00
					TLI	EPA 200.8	CRTD	10/12/2010	Daniel Kang/Hope Trinidad	µg/L	1.10	1.0	0.095
					TLI	EPA 200.8	CUD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (5.0)	5.0	0.305
					TLI	EPA 200.8	HGD	10/15/2010	Daniel Kang/Hope Trinidad	µg/L	ND (0.2)	0.2	0.025
					TLI	EPA 200.8	MND	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (10)	10.0	0.21
					TLI	EPA 200.8	MOD	10/12/2010	Daniel Kang/Hope Trinidad	µg/L	17.4	10.0	0.66
					TLI	EPA 200.8	NID	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (10)	10.0	0.24
					TLI	EPA 200.8	PBD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (10)	10.0	0.095
					TLI	EPA 200.8	SBD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (10)	10.0	0.19
					TLI	EPA 200.8	SED	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (10)	10.0	0.74
					TLI	EPA 200.8	TLD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (1.0)	1.0	0.18
					TLI	EPA 200.8	VD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (5.0)	5.0	0.10
					TLI	EPA 200.8	ZND	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (10)	10.0	1.32
					TLI	EPA 218.6	CR6	10/8/2010	Sonya Bersudsky	µg/L	0.88	0.2	0.022
					TLI	EPA 300.0	CL	10/7/2010	Giawad Ghenniwa	mg/L	2150	100	12.0
					TLI	EPA 300.0	FL	10/6/2010	Giawad Ghenniwa	mg/L	2.19	0.5	0.06
					TLI	EPA 300.0	SO4	10/7/2010	Giawad Ghenniwa	mg/L	490	12.5	1.00
					TLI	EPA 6010B	FE	10/8/2010	Ethel Suico	mg/L	ND (0.02)	0.02	0.004
					TLI	SM 2320B	ALKB	10/12/2010	Iordan Stavrev	mg/L	44.0	5.0	0.153

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Location	Sample ID	Sampler Name	Sample Date	Sample Time	Lab	Analysis Method	Parameter	Analysis Date	Lab Technician	Units	Result	RL	MDL
OW-02D	OW-02D-024	Barry Collom	10/5/2010	2:11:00 PM	TLI	SM 2320B	ALKC	10/12/2010	Iordan Stavrev	mg/L	ND (5.0)	5.0	0.153
					TLI	SM 2320B	ALKT	10/12/2010	Iordan Stavrev	mg/L	44.0	5.0	1.68
					TLI	SM2130B	TRB	10/6/2010	Gautam Savani	NTU	0.386	0.1	0.014
					TLI	SM2540C	TDS	10/7/2010	Jenny Tankunakorn	mg/L	4470	250	0.434
					TLI	SM4500NH3D	NH3N	10/12/2010	Iordan Stavrev	mg/L	ND (0.5)	0.5	0.002
					EMXT	SM4500NO3-E	NO3NO2N	10/12/2010	Mary Jane Mendoza	mg/L	2.30	0.5	0.10
OW-02M	OW-02M-024	Barry Collom	10/5/2010	3:08:00 PM	TLI	EPA 120.1	SC	10/6/2010	Iordan Stavrev	µmhos/cm	7260	2.0	0.038
					TLI	EPA 200.7	BD	10/14/2010	Ethel Suico	mg/L	0.961	0.20	0.025
					TLI	EPA 200.7	CAD	10/14/2010	Ethel Suico	mg/L	178	50.0	5.49
					TLI	EPA 200.7	FETD	10/14/2010	Ethel Suico	mg/L	ND (0.02)	0.02	0.003
					TLI	EPA 200.7	KD	10/14/2010	Ethel Suico	mg/L	15.1	1.00	0.132
					TLI	EPA 200.7	MGD	10/14/2010	Ethel Suico	mg/L	21.8	2.50	0.095
					TLI	EPA 200.7	NAD	10/14/2010	Ethel Suico	mg/L	1300	100	4.40
					TLI	EPA 200.8	AGD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (5.0)	5.0	0.20
					TLI	EPA 200.8	ALD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (50)	50.0	6.00
					TLI	EPA 200.8	ASD	10/14/2010	Daniel Kang/Hope Trinidad	µg/L	ND (1.0)	1.0	0.26
					TLI	EPA 200.8	BAD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	51.3	10.0	0.185
					TLI	EPA 200.8	BED	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (1.0)	1.0	0.11
					TLI	EPA 200.8	CDD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (3.0)	3.0	0.125
					TLI	EPA 200.8	COBD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (5.0)	5.0	0.00
					TLI	EPA 200.8	CRTD	10/12/2010	Daniel Kang/Hope Trinidad	µg/L	4.00	1.0	0.095
					TLI	EPA 200.8	CUD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (5.0)	5.0	0.305
					TLI	EPA 200.8	HGD	10/15/2010	Daniel Kang/Hope Trinidad	µg/L	ND (0.2)	0.2	0.025
					TLI	EPA 200.8	MND	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (10)	10.0	0.21
					TLI	EPA 200.8	MOD	10/12/2010	Daniel Kang/Hope Trinidad	µg/L	21.5	10.0	0.66
					TLI	EPA 200.8	NID	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (10)	10.0	0.24
					TLI	EPA 200.8	PBD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (10)	10.0	0.095

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Location	Sample ID	Sampler Name	Sample Date	Sample Time	Lab	Analysis Method	Parameter	Analysis Date	Lab Technician	Units	Result	RL	MDL
OW-02M	OW-02M-024	Barry Collom	10/5/2010	3:08:00 PM	TLI	EPA 200.8	SBD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (10)	10.0	0.19
					TLI	EPA 200.8	SED	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (10)	10.0	0.74
					TLI	EPA 200.8	TLD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (1.0)	1.0	0.18
					TLI	EPA 200.8	VD	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (5.0)	5.0	0.10
					TLI	EPA 200.8	ZND	10/11/2010	Daniel Kang/Hope Trinidad	µg/L	ND (10)	10.0	1.32
					TLI	EPA 218.6	CR6	10/8/2010	Sonya Bersudsky	µg/L	4.00	1.0	0.11
					TLI	EPA 300.0	CL	10/7/2010	Giawad Ghenniwa	mg/L	2130	100	12.0
					TLI	EPA 300.0	FL	10/6/2010	Giawad Ghenniwa	mg/L	2.76	0.5	0.06
					TLI	EPA 300.0	SO4	10/7/2010	Giawad Ghenniwa	mg/L	500	12.5	1.00
					TLI	EPA 6010B	FE	10/8/2010	Ethel Suico	mg/L	ND (0.02)	0.02	0.004
					TLI	SM 2320B	ALKB	10/12/2010	Iordan Stavrev	mg/L	50.0	5.0	0.153
					TLI	SM 2320B	ALKC	10/12/2010	Iordan Stavrev	mg/L	ND (5.0)	5.0	0.153
					TLI	SM 2320B	ALKT	10/12/2010	Iordan Stavrev	mg/L	50.0	5.0	1.68
					TLI	SM2130B	TRB	10/6/2010	Gautam Savani	NTU	0.262	0.1	0.014
					TLI	SM2540C	TDS	10/7/2010	Jenny Tankunakorn	mg/L	4640	250	0.434
					TLI	SM4500NH3D	NH3N	10/12/2010	Iordan Stavrev	mg/L	ND (0.5)	0.5	0.002
					EMXT	SM4500NO3-E	NO3NO2N	10/12/2010	Mary Jane Mendoza	mg/L	2.41	0.5	0.10
OW-02S	OW-02S-024	Barry Collom	10/5/2010	3:40:00 PM	TLI	EPA 120.1	SC	10/6/2010	Iordan Stavrev	µmhos/cm	1690	2.0	0.038
					TLI	EPA 200.8	CRTD	10/12/2010	Daniel Kang/Hope Trinidad	µg/L	29.3	1.0	0.019
					TLI	EPA 218.6	CR6	10/8/2010	Sonya Bersudsky	µg/L	34.3	1.0	0.11
					TLI	EPA 300.0	CL	10/7/2010	Giawad Ghenniwa	mg/L	388	20.0	2.40
					TLI	EPA 300.0	FL	10/6/2010	Giawad Ghenniwa	mg/L	5.09	0.5	0.06
					TLI	EPA 300.0	SO4	10/7/2010	Giawad Ghenniwa	mg/L	106	12.5	1.00
					TLI	SM2130B	TRB	10/6/2010	Gautam Savani	NTU	0.662	0.1	0.014
					TLI	SM2540C	TDS	10/7/2010	Jenny Tankunakorn	mg/L	932	50.0	0.434
					EMXT	SM4500NO3-E	NO3NO2N	10/12/2010	Mary Jane Mendoza	mg/L	3.05	0.5	0.10
OW-05D	OW-05D-024	Barry Collom	10/6/2010	11:12:28 AM	TLI	EPA 120.1	SC	10/15/2010	Iordan Stavrev	µmhos/cm	7260	2.0	0.038

TABLE 11
Board Order No. R7-2006-0060 WDR Monitoring Information for Groundwater Samples, Second Half 2010
PG&E Topock Compliance Monitoring Program

Location	Sample ID	Sampler Name	Sample Date	Sample Time	Lab	Analysis Method	Parameter	Analysis Date	Lab Technician	Units	Result	RL	MDL
OW-05D	OW-05D-024	Barry Collom	10/6/2010	11:12:28 AM	TLI	EPA 200.8	CRTD	10/12/2010	Hope Trinidad	µg/L	1.60	1.0	0.095
					TLI	EPA 218.6	CR6	10/12/2010	Sonya Bersudsky	µg/L	1.20	1.0	0.11
					TLI	EPA 300.0	CL	10/11/2010	Giawad Ghenniwa	mg/L	2040	100	12.0
					TLI	EPA 300.0	FL	10/11/2010	Giawad Ghenniwa	mg/L	2.67	0.5	0.06
					TLI	EPA 300.0	SO4	10/11/2010	Giawad Ghenniwa	mg/L	500	12.5	1.00
					TLI	SM2130B	TRB	10/8/2010	Iordan Stavrev	NTU	0.67	0.1	0.014
					TLI	SM2540C	TDS	10/11/2010	Jenny Tankunakorn	mg/L	4410	250	0.434
					EMXT	SM4500NO3-E	NO3NO2N	10/20/2010	Mary Jane Mendoza	mg/L	1.95	1.0	0.20
OW-05M	OW-05M-024	Barry Collom	10/6/2010	12:05:11 PM	TLI	EPA 120.1	SC	10/15/2010	Iordan Stavrev	µmhos/cm	7240	2.0	0.038
					TLI	EPA 200.8	CRTD	10/12/2010	Hope Trinidad	µg/L	2.00	1.0	0.095
					TLI	EPA 218.6	CR6	10/12/2010	Sonya Bersudsky	µg/L	2.20	1.0	0.11
					TLI	EPA 300.0	CL	10/11/2010	Giawad Ghenniwa	mg/L	2150	100	12.0
					TLI	EPA 300.0	FL	10/11/2010	Giawad Ghenniwa	mg/L	2.81	0.5	0.06
					TLI	EPA 300.0	SO4	10/11/2010	Giawad Ghenniwa	mg/L	501	12.5	1.00
					TLI	SM2130B	TRB	10/8/2010	Iordan Stavrev	NTU	0.567	0.1	0.014
					TLI	SM2540C	TDS	10/11/2010	Jenny Tankunakorn	mg/L	4550	250	0.434
					EMXT	SM4500NO3-E	NO3NO2N	10/20/2010	Mary Jane Mendoza	mg/L	1.95	1.0	0.20
OW-05S	OW-05S-024	Barry Collom	10/6/2010	12:36:00 PM	TLI	EPA 120.1	SC	10/15/2010	Iordan Stavrev	µmhos/cm	2320	2.0	0.038
					TLI	EPA 200.8	CRTD	10/12/2010	Hope Trinidad	µg/L	18.9	1.0	0.095
					TLI	EPA 218.6	CR6	10/12/2010	Sonya Bersudsky	µg/L	20.3	1.0	0.11
					TLI	EPA 300.0	CL	10/11/2010	Giawad Ghenniwa	mg/L	595	100	12.0
					TLI	EPA 300.0	FL	10/11/2010	Giawad Ghenniwa	mg/L	2.27	0.5	0.06
					TLI	EPA 300.0	SO4	10/11/2010	Giawad Ghenniwa	mg/L	122	12.5	1.00
					TLI	SM2130B	TRB	10/8/2010	Iordan Stavrev	NTU	1.97	0.1	0.014
					TLI	SM2540C	TDS	10/11/2010	Jenny Tankunakorn	mg/L	1340	50.0	0.434
					EMXT	SM4500NO3-E	NO3NO2N	10/20/2010	Mary Jane Mendoza	mg/L	2.45	1.0	0.20

NOTES:

MDL	method detection limit corrected for sample dilution
RL	reporting limit corrected for sample dilution
ND	parameter not detected at the listed reporting limit
µmhos/cm	micro-mhos per centimeter
NTU	Nephelometric Turbidity Unit
mg/L	milligrams per liter
µg/L	micrograms per liter
J	Concentration estimated by laboratory or data validation

TLI	Truesdail Laboratories, Inc.
EMXT	Emax Laboratories
WDR	Waste Discharge Requirements

ALKC	alkalinity, as carbonate	HGD	mercury, dissolved
ALKT	alkalinity, total as CaCO3	KD	potassium, dissolved
ALKB	alkalinity, bicarbonate as CaCO3	MGD	magnesium, dissolved
ALD	almunium, dissolved	MND	manganese, dissolved
AGD	silver, dissolved	MOD	molybdenum, dissolved
ASD	arsenic, dissolved	NAD	sodium, dissolved
BD	boron, dissolved	NID	nickel, dissolved
BAD	barium, dissolved	NH3N	ammonia (as Nitrogen)
BED	beryllium, dissolved	NO3NO2N	nitrate/nitrite (as Nitrogen)
CAD	calcium, dissolved	PBD	lead, dissolved
CDD	cadmium, dissolved	SBD	antimony, dissolved
CL	chloride	SC	specific conductance
COBD	cobalt, dissolved	SED	selenium, dissolved
CRTD	chromium, dissolved	SO4	sulfate
CR6	hexavalent chromium	TLD	thallium, dissolved
CUD	copper, dissolved	TDS	total dissolved solids
FE	iron	TRB	turbidity
FETD	iron, dissolved	VD	vanadium, dissolved
FL	fluoride	ZND	zinc, dissolved

Figures

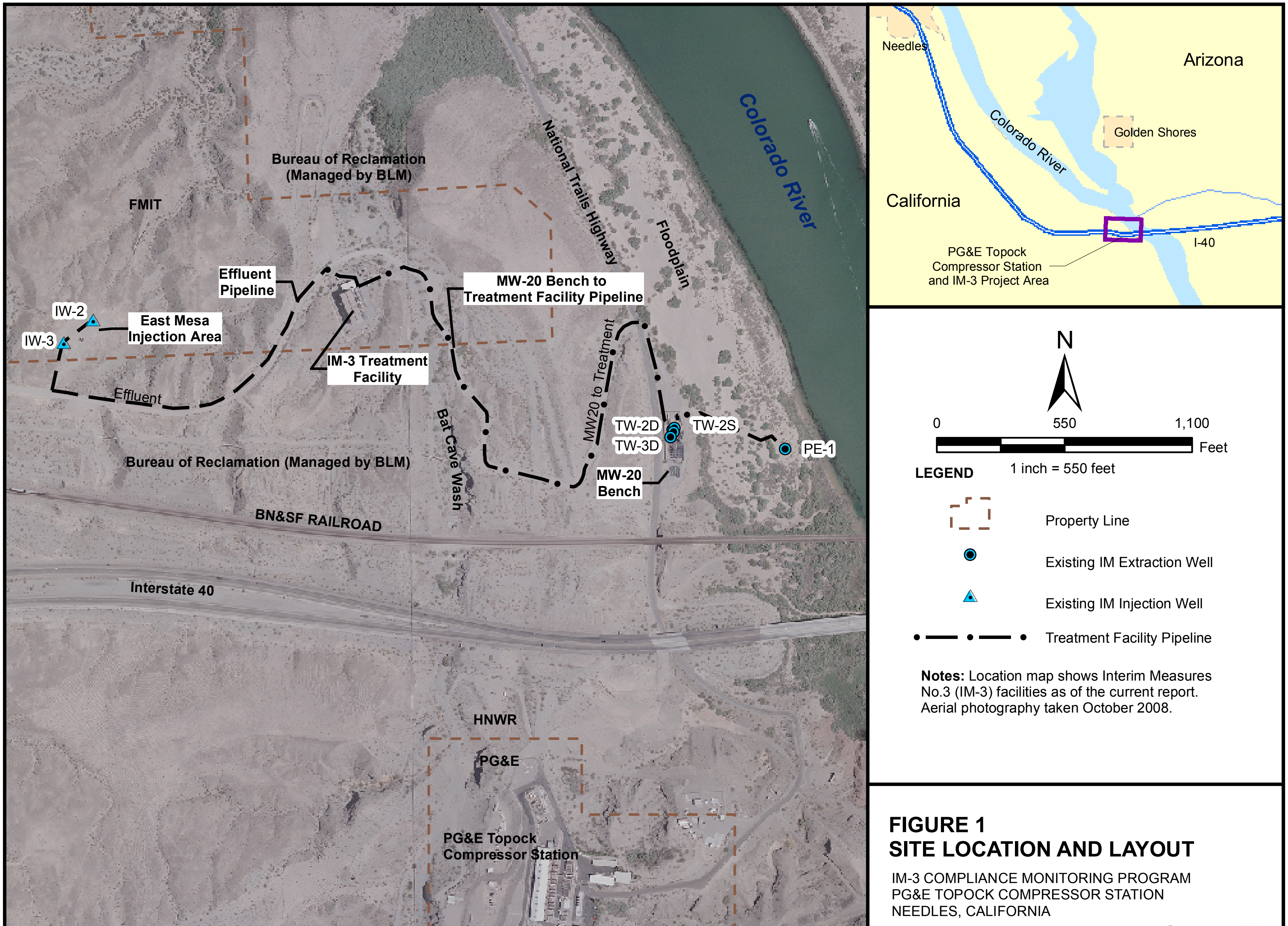

FIGURE 1
SITE LOCATION AND LAYOUT

IM-3 COMPLIANCE MONITORING PROGRAM
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

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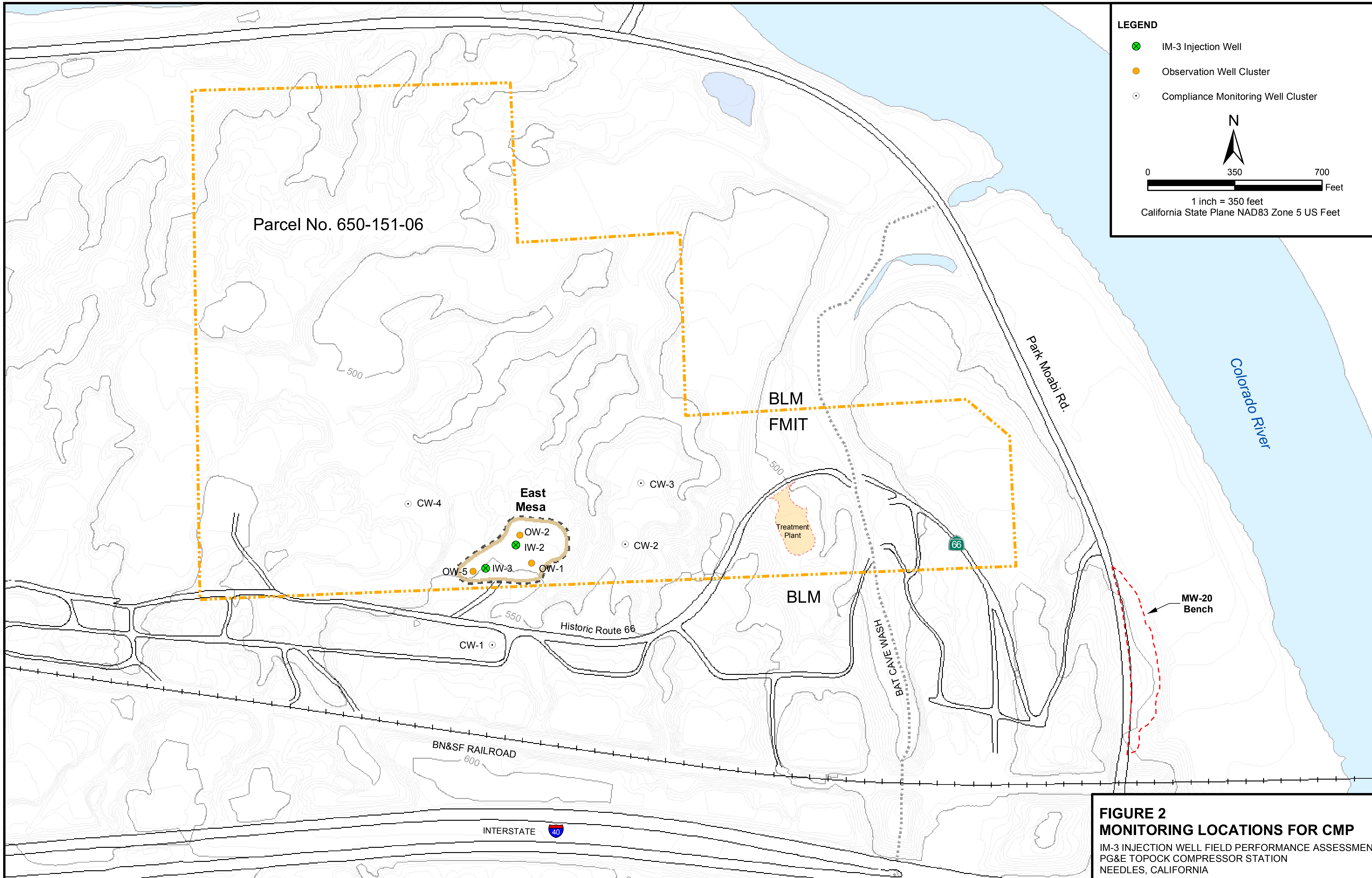

FIGURE 2
MONITORING LOCATIONS FOR CMP
IM-3 INJECTION WELL FIELD PERFORMANCE ASSESSMENT
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

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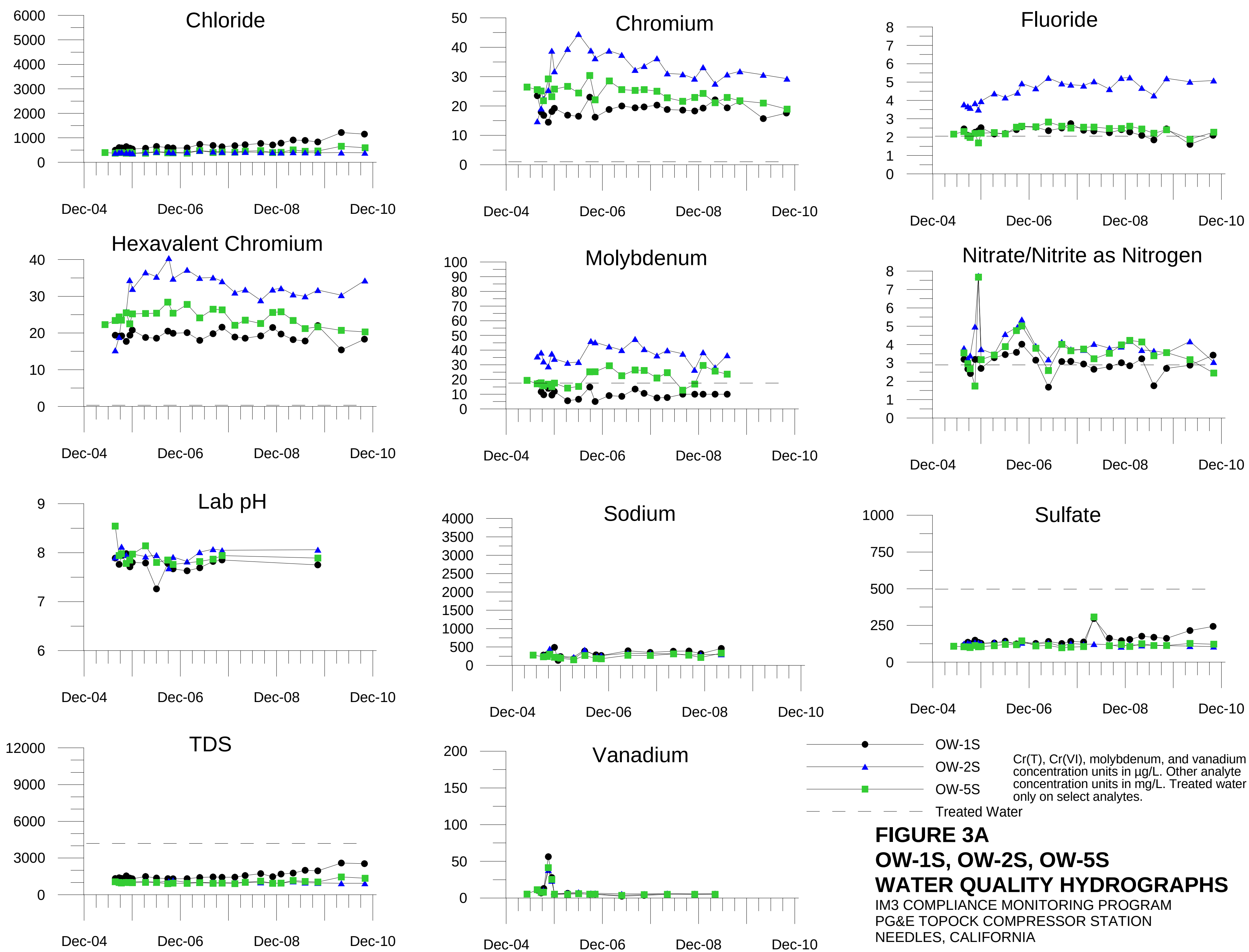

FIGURE 3A
OW-1S, OW-2S, OW-5S
WATER QUALITY HYDROGRAPHS
IM3 COMPLIANCE MONITORING PROGRAM
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

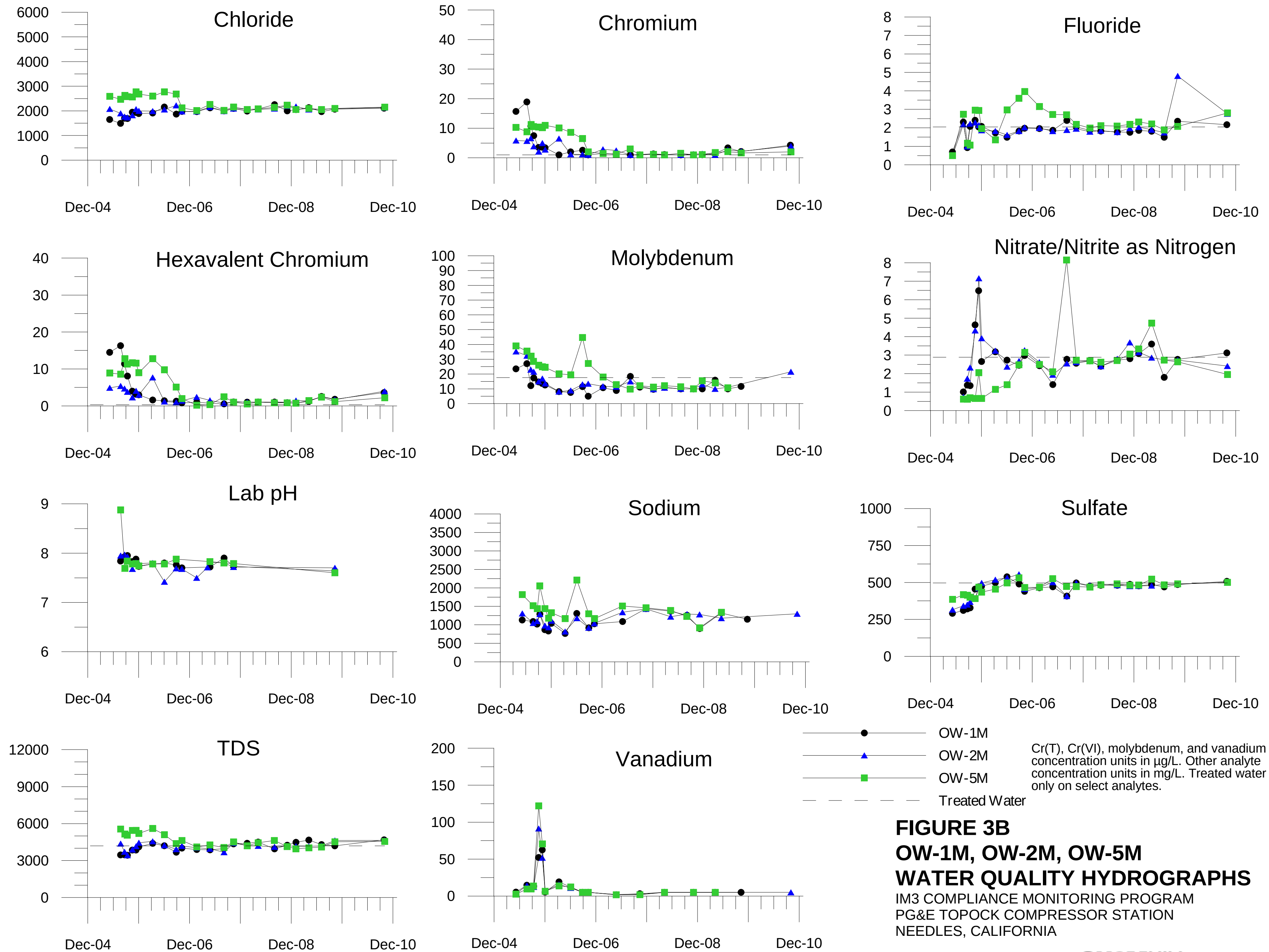

FIGURE 3B
OW-1M, OW-2M, OW-5M
WATER QUALITY HYDROGRAPHS

IM3 COMPLIANCE MONITORING PROGRAM
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

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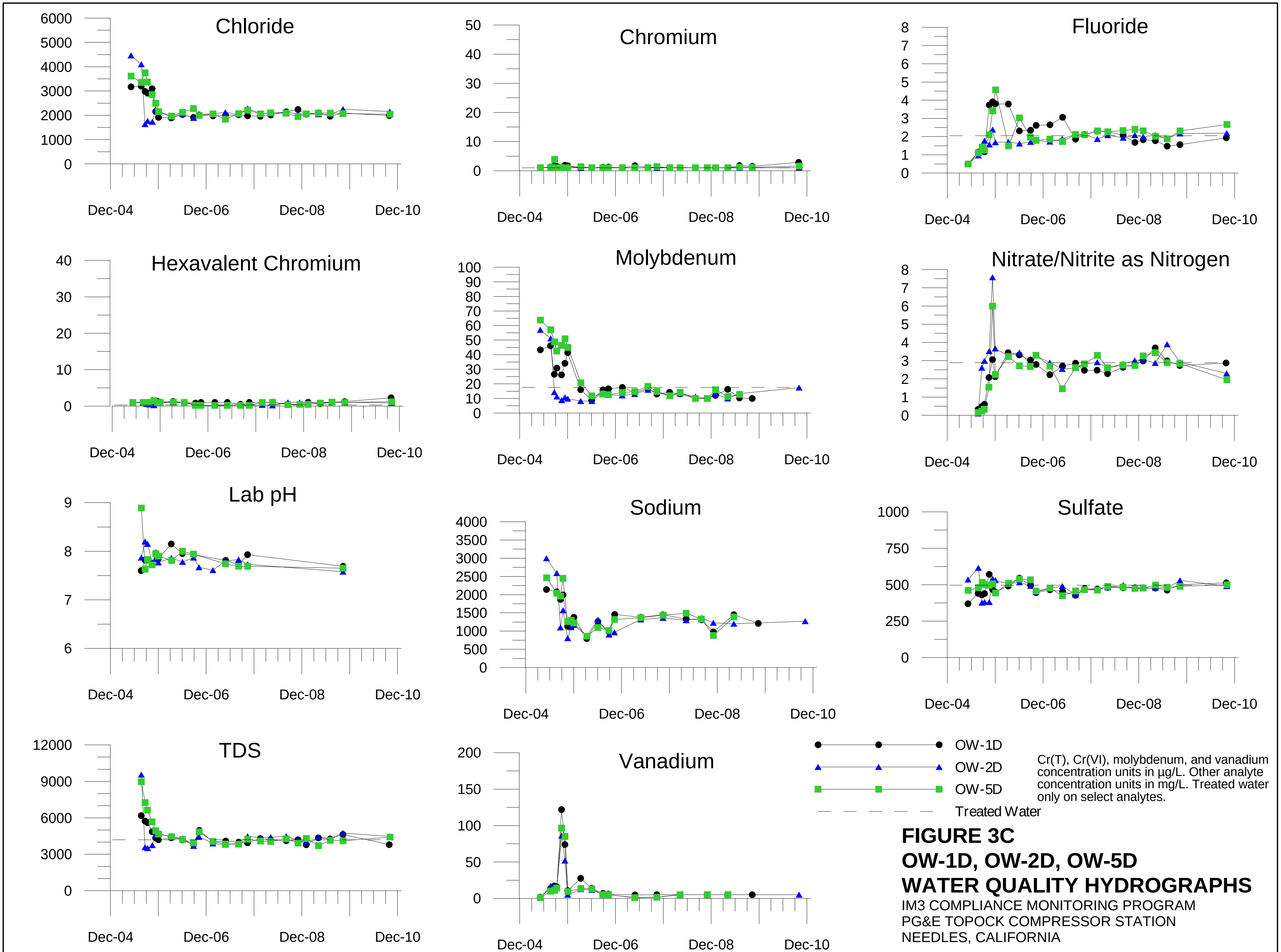

FIGURE 3C
OW-1D, OW-2D, OW-5D
WATER QUALITY HYDROGRAPHS
IM3 COMPLIANCE MONITORING PROGRAM
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

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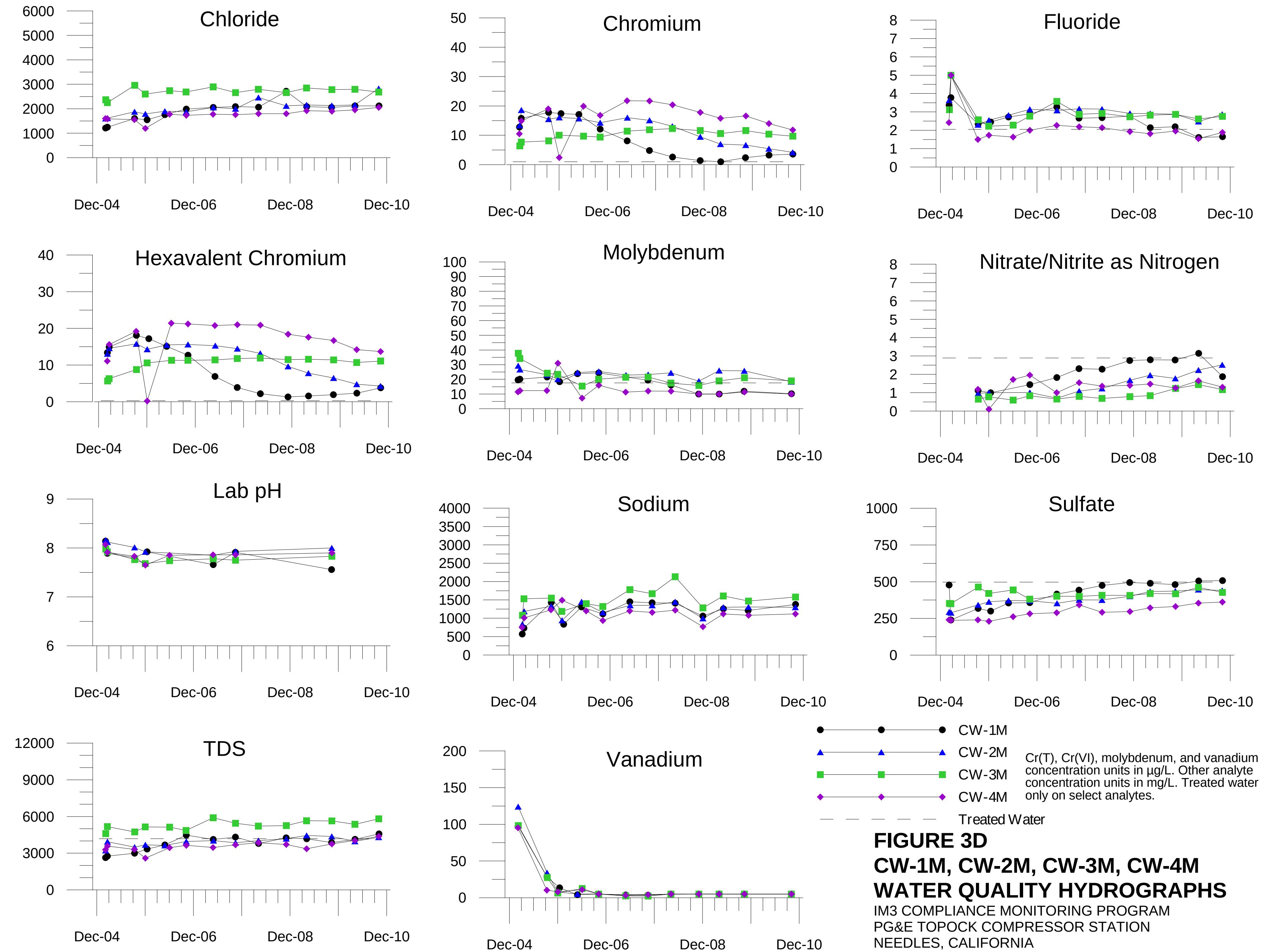

FIGURE 3D
CW-1M, CW-2M, CW-3M, CW-4M
WATER QUALITY HYDROGRAPHS
IM3 COMPLIANCE MONITORING PROGRAM
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

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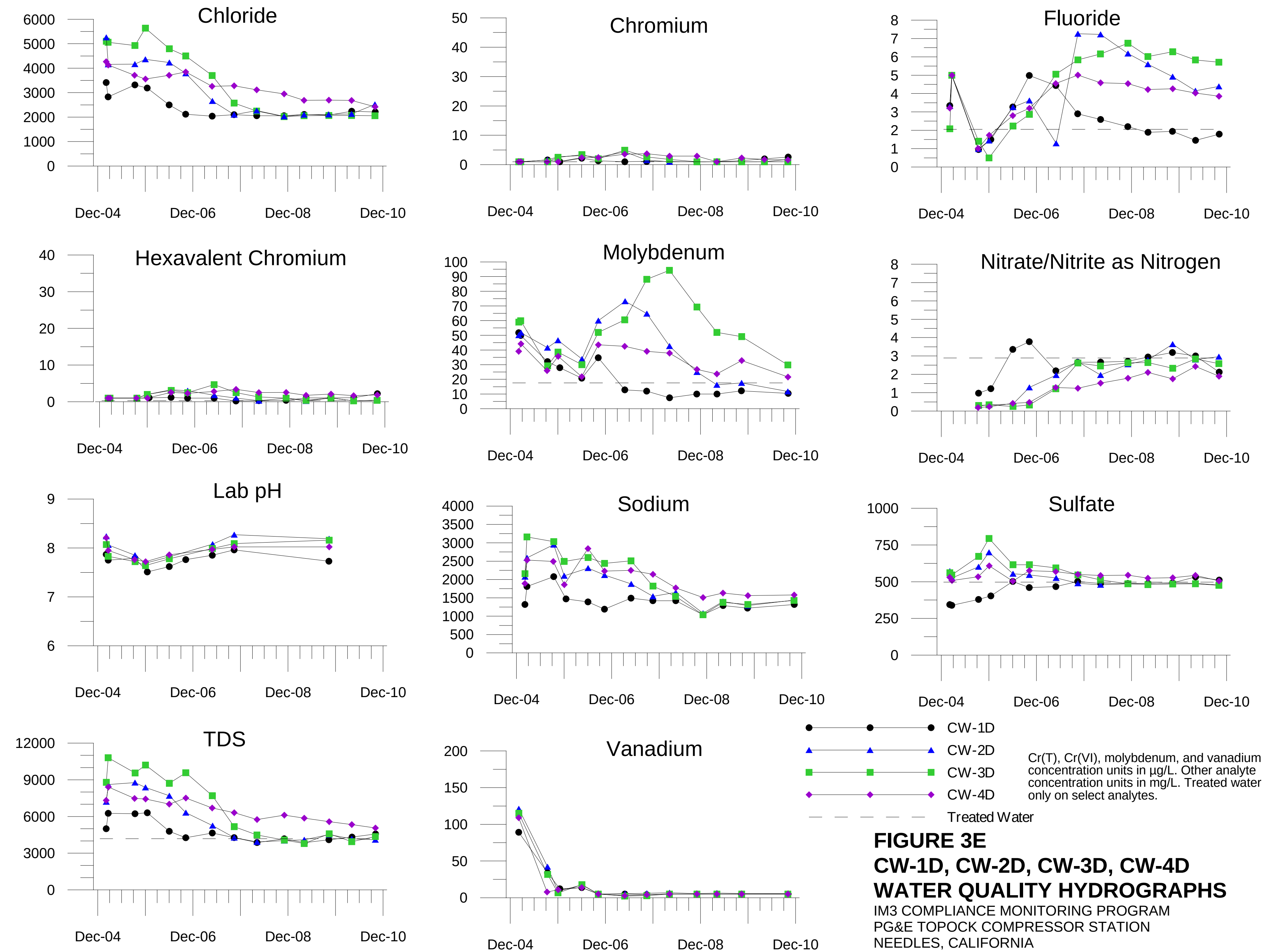
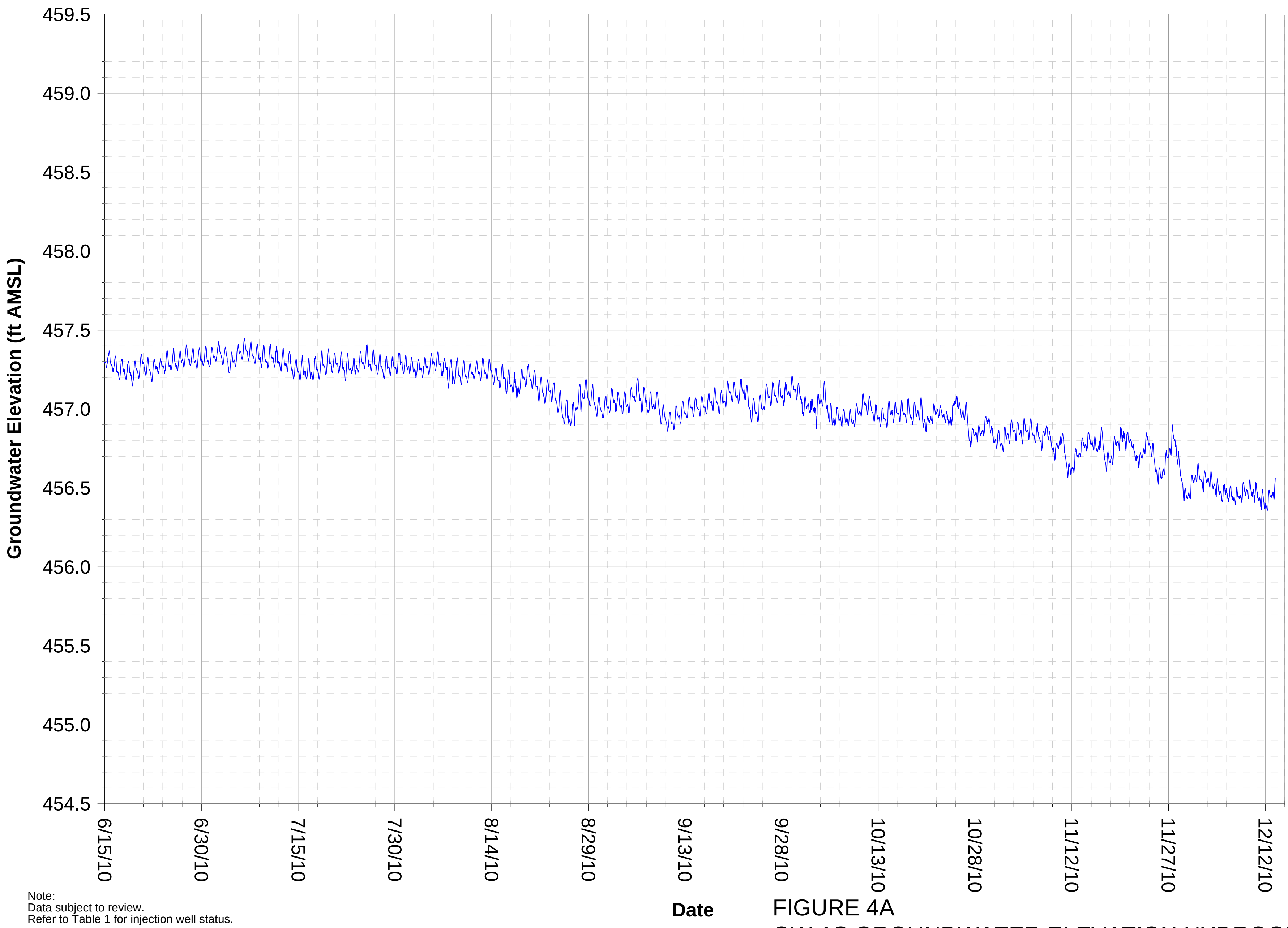


FIGURE 3E
CW-1D, CW-2D, CW-3D, CW-4D
WATER QUALITY HYDROGRAPHS

IM3 COMPLIANCE MONITORING PROGRAM
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

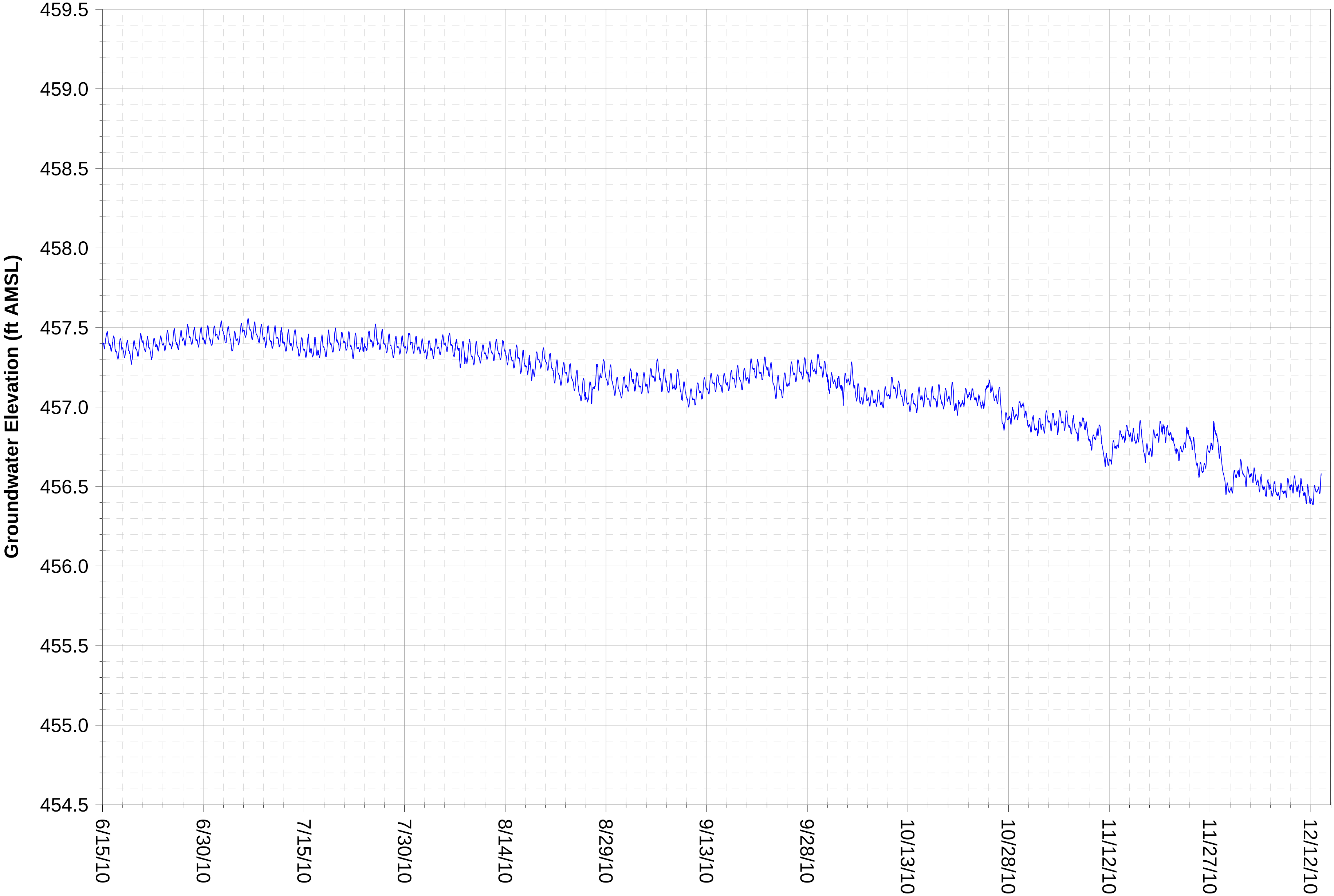
CH2MHILL



Note:
Data subject to review.
Refer to Table 1 for injection well status.

FIGURE 4A
OW-1S GROUNDWATER ELEVATION HYDROGRAPH
IM-3 COMPLIANCE MONITORING PROGRAM
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

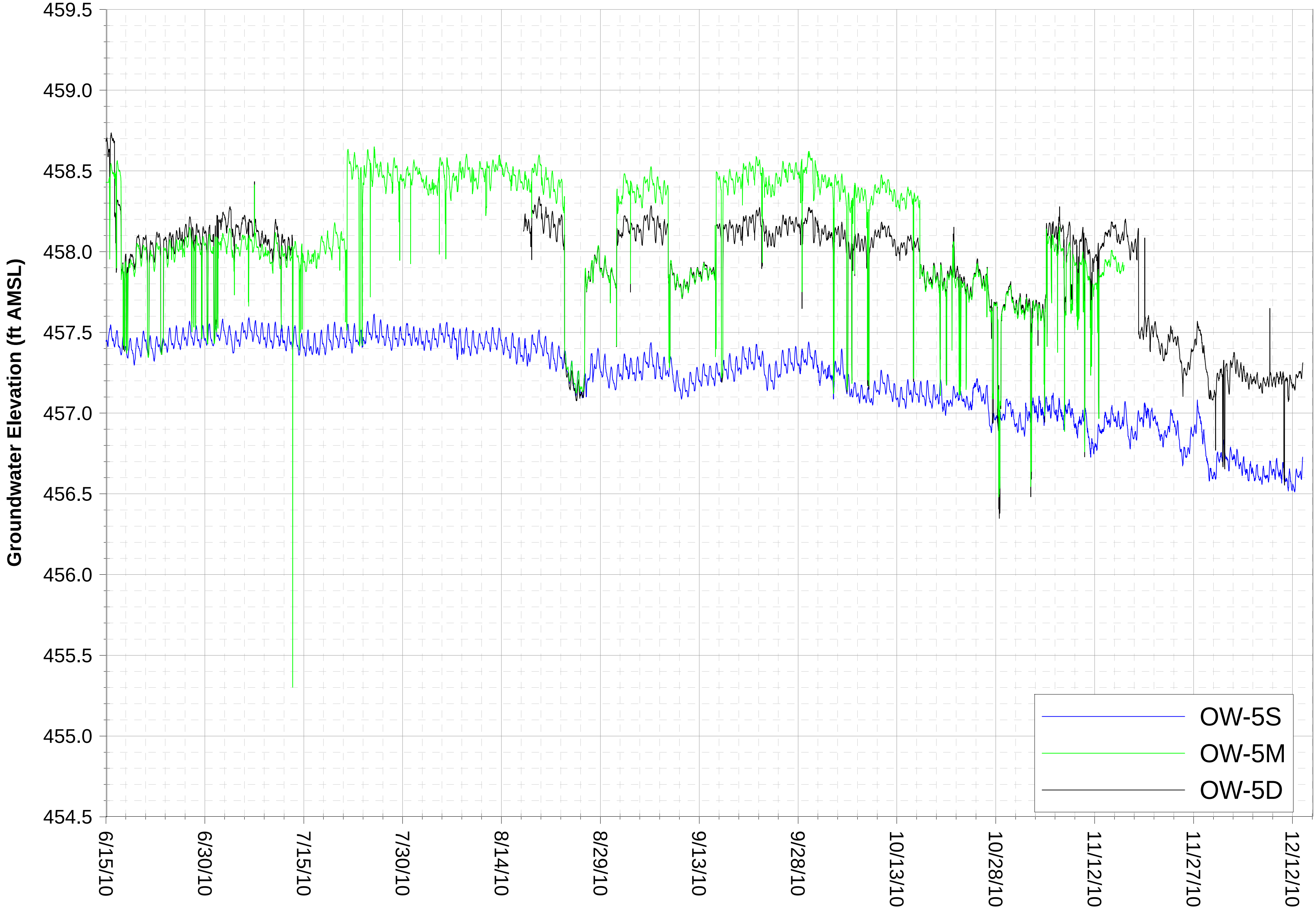
CH2MHILL



Note:
Data subject to review.
Refer to Table 1 for injection well status.

FIGURE 4B
OW-2S GROUNDWATER ELEVATION HYDROGRAPH
IM-3 COMPLIANCE MONITORING PROGRAM
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

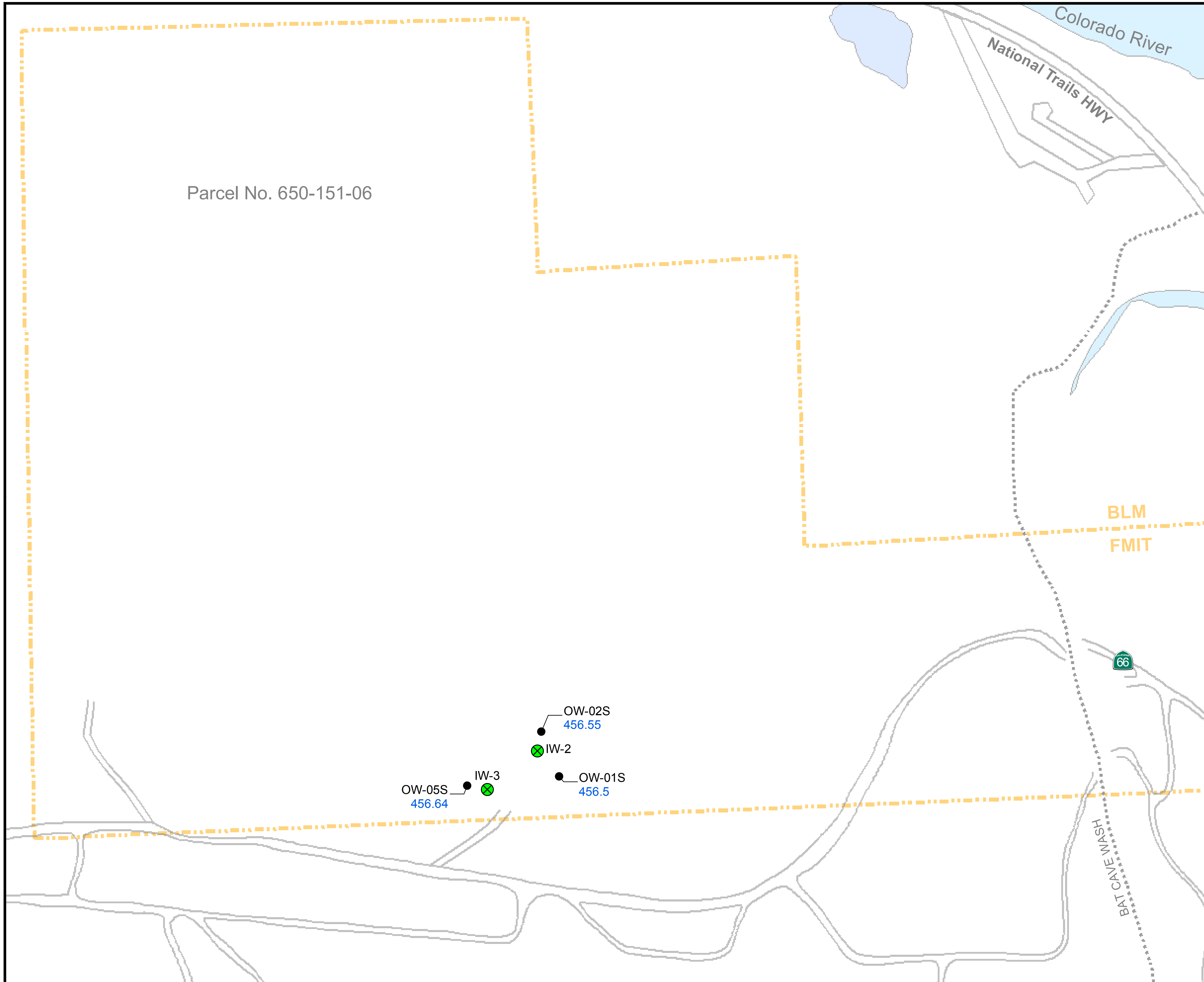
CH2MHILL



Note:
Data subject to review.
Refer to Table 1 for injection well status.
OW-5D data unavailable from July 13, 2010 until August 17, 2010 due to transducer failure.
OW-5M data unavailable from November 16, 2010 until present due to transducer failure.

FIGURE 4C
OW-5 GROUNDWATER ELEVATION HYDROGRAPHS
IM-3 COMPLIANCE MONITORING PROGRAM
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL



LEGEND

- Groundwater Monitoring, Compliance, and Observation Well
- IM-3 Injection Well

Groundwater Elevations for Shallow Wells in IM-3 Injection Area

OW-05S **456.64** Salinity and temperature adjusted groundwater head elevation in feet above mean sea level (MSL)

FIGURE 5A
AVERAGE GROUNDWATER ELEVATION CONTOURS FOR SHALLOW WELLS NOVEMBER 29, 2010

IM3 COMPLIANCE MONITORING PROGRAM
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

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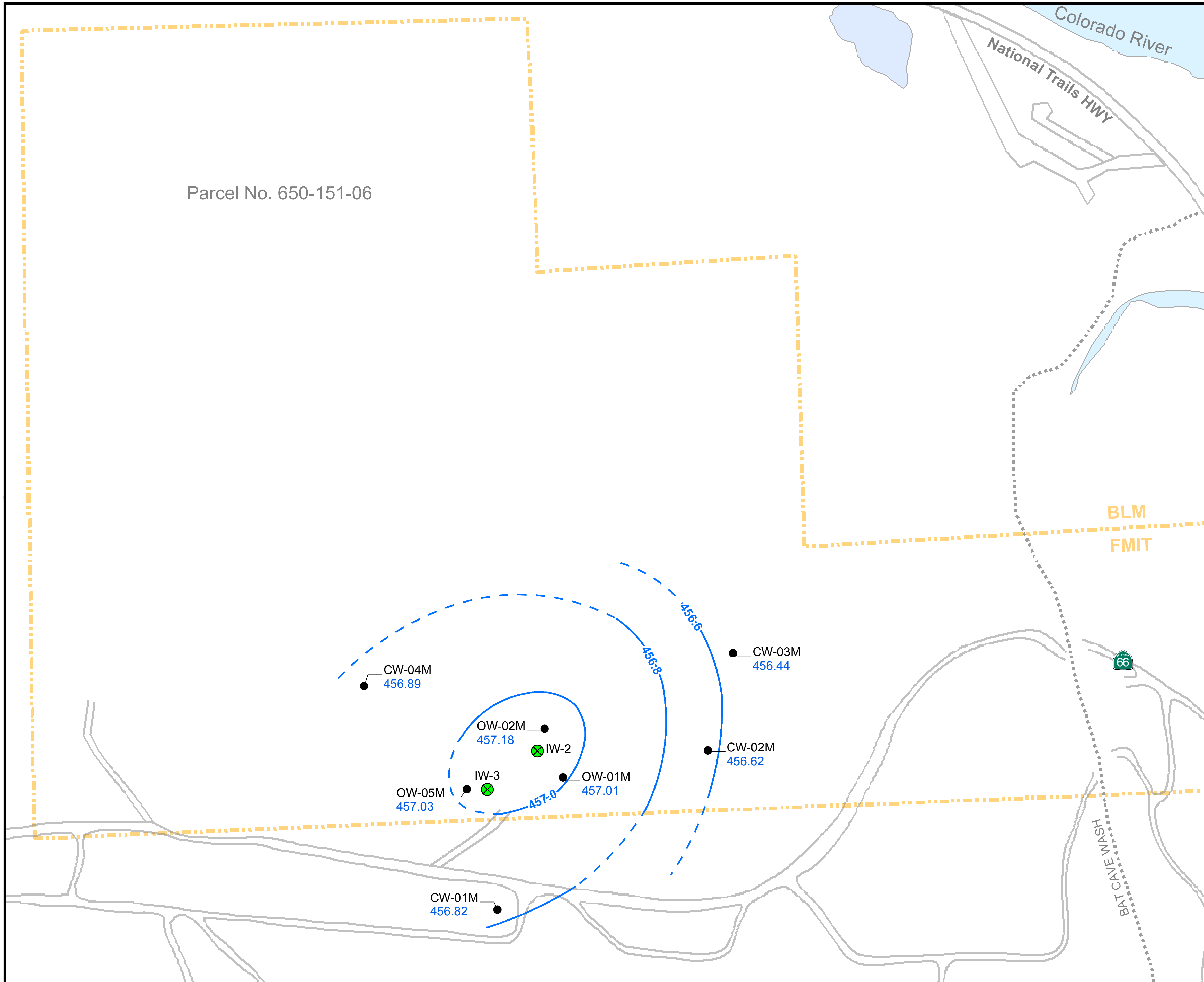

N

0 250 500 Feet

1 inch = 250 feet

California State Plane NAD83 Zone 5 US Feet

LEGEND

IM-3 Injection Well

Groundwater Monitoring, Compliance, and Observation Well

Groundwater Elevations for Mid-Depth Wells in IM-3 Injection Area

OW-05M **457.03** Salinity and temperature adjusted groundwater head elevation in feet above mean sea level (MSL)

Groundwater elevation contour in feet above MSL (0.2 foot interval), dashed where inferred

FIGURE 5B
AVERAGE GROUNDWATER ELEVATION CONTOURS FOR MID DEPTH WELLS NOVEMBER 29, 2010

IM3 COMPLIANCE MONITORING PROGRAM
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

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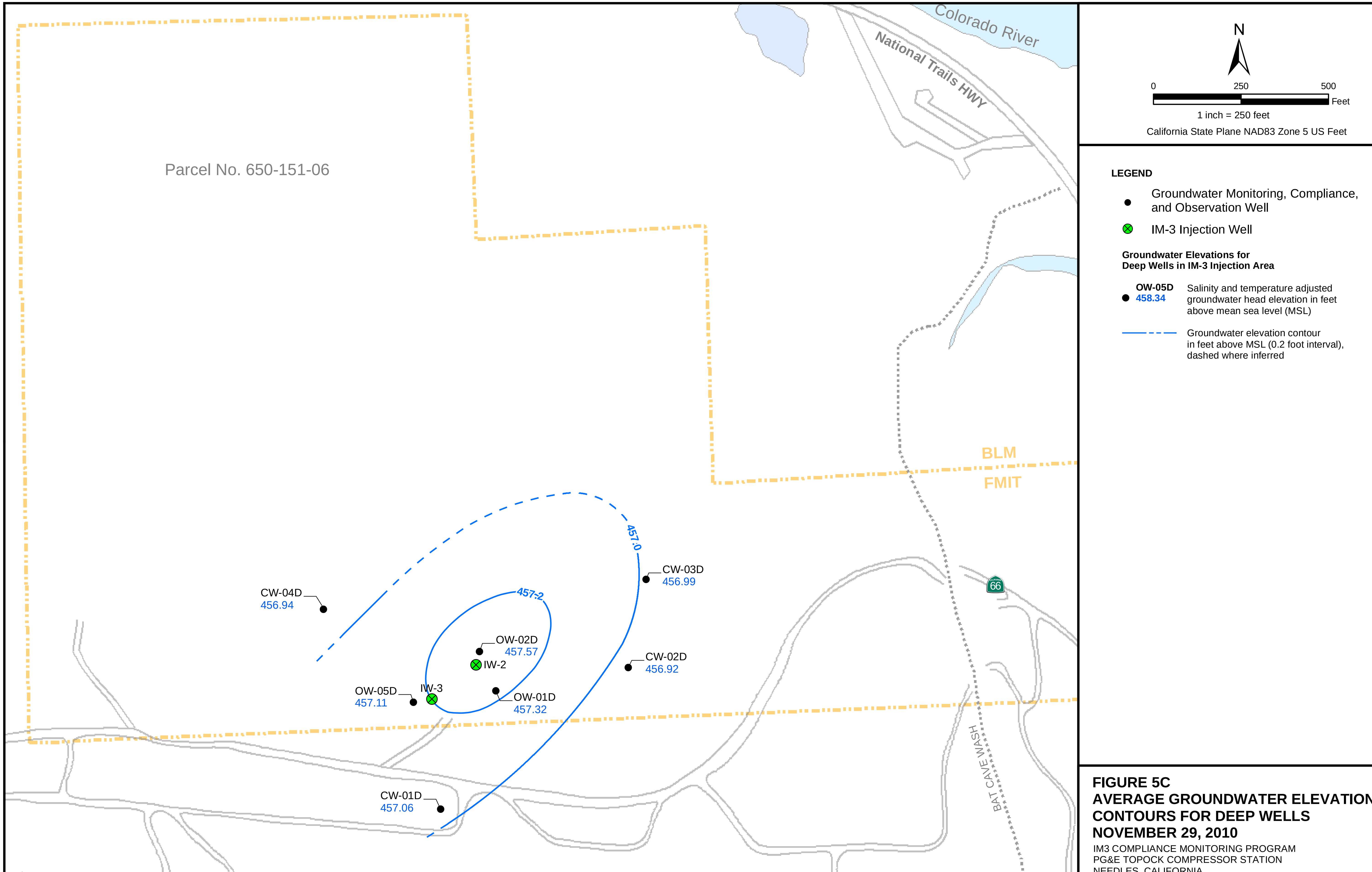

FIGURE 5C
AVERAGE GROUNDWATER ELEVATION CONTOURS FOR DEEP WELLS NOVEMBER 29, 2010

IM3 COMPLIANCE MONITORING PROGRAM
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

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Appendix A
Laboratory Reports, Second Half 2010

Appendix B
Field Data Sheets, Second Half 2010