Topock Project Executive Abstract

Document Title: Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles CA Submitting Agency: DTSC Final Document? ☒ Yes ☐ No	Date of Document: March 15, 2017 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 under DTSC requirements.	Other Justification/s: ☐ Permit ☐ Other / Explain:

Brief Summary of attached document:

This quarterly report documents the monitoring activities and performance evaluation of the interim measure (IM) hydraulic containment system under the IM Performance Monitoring Program, the Groundwater Monitoring Program, and Surface Water Monitoring Program for the Topock Project. Hydraulic and chemical monitoring data were collected and used to evaluate the IM hydraulic containment system performance based on a set of standards approved by the California Department of Substances Control (DTSC). Key items included in this report are: (1) measured groundwater elevations and hydraulic gradient data at compliance well pairs that indicate the direction of groundwater flow is away from the Colorado River and toward the pumping centers on site; (2) hexavalent chromium data for monitoring wells; (3) pumping rates and volumes from the IM extraction system; and (4) Groundwater Monitoring Program and Surface Water Monitoring Program activities and results.

Based on the data and evaluation presented in this report, the IM performance standard has been met for the Fourth Quarter 2016 and annual reporting period. On July 23, 2010, DTSC approved a revised reporting schedule for this report that included a revised IM-3 sample collection period from November 1, 2016 through December 31, 2016. The average pumping rate for the IM extraction system during Fourth Quarter 2016 was 134.9 gallons per minute, and an estimated 78.8 pounds (35.8 kilograms) of chromium were removed in October, November, and December 2016. To date, the IM extraction system has removed 8,800 pounds (3,990 kilograms) of chromium.

Written by: PG&E

Recommendations:
Updated recommendations for sampling method trials presented in Section 7. Additional “pending” recommendations from previous reports also provided in Section 7.

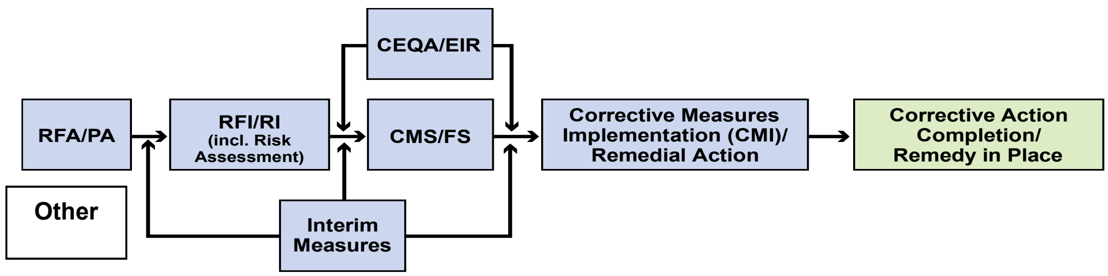
How is this information related to the Final Remedy or Regulatory Requirements:

This report is required by DTSC as part of the Interim Measures Performance Monitoring Program.

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).



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

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

Location
6588 Ontario Road
San Luis Obispo, CA 93405

805.234.2257
E-Mail: YJM1@pge.com

March 15, 2017

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

Subject: *Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California* (PGE20170315A)

Dear Mr. Yue:

Enclosed is the Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California, for Pacific Gas and Electric Company's Interim Measures (IMs) Performance Monitoring Program and the Groundwater Monitoring Program and Surface Water Monitoring Program for the Topock project. This report presents the Fourth Quarter (November through December2016) performance monitoring results for the IM-3 hydraulic containment system and provides the annual performance evaluation for the 2016 Reporting Period (January through December 2016). This report also presents groundwater and surface water monitoring activities, results, and analyses related to the Groundwater and Surface Water Monitoring Programs during the 2016 Reporting Period.

The IM quarterly performance monitoring report is submitted in conformance with the reporting requirements in the California Environmental Protection Agency, Department of Toxic Substances Control's (DTSC) IM directive, dated February 14, 2005, and updates and modifications approved by DTSC in letters or emails dated October 12, 2007; July 14, 2008; July 17, 2008; March 3, 2010; April 28, 2010; July 23, 2010; June 27, 2014; and July 20, 2015.

Please contact me at (805) 234-2257 if you have any questions on the combined monitoring report.

Sincerely,

Betsy Brunswick

Betsy Brunswick on behalf of Yvonne Meeks
Topock Remediation Project Manager

Cc: Chris Guerre/DTSC
Karen Baker/DTSC
Pam Innis/DOI
Susan Young/CA-SLC
Bruce Campbell/AZ-SLD

Pacific Gas and Electric Company

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT

Topock Compressor Station,
Needles, California

March 15, 2017

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT

PG&E Topock Compressor Station,

Needles, California

Prepared for:

California Department of Toxic Substances Control

Prepared by:

Arcadis U.S., Inc.

101 Creekside Ridge Court

Suite 200

Roseville

California 95678

Tel 916 786 0320

Fax 916 786 0366

Our Ref.:

[RC000753.802A]

Date:

March 15, 2017

This document is intended only for the use of the individual or entity for which it was prepared and may contain information that is privileged, confidential and exempt from disclosure under applicable law. Any dissemination, distribution or copying of this document is strictly prohibited.

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

Fred Stanin, P.G., C. Hg

Principal Hydrogeologist

Daniel Cichy

Arcadis Report Lead

Dan Bush

Arcadis Monitoring Project Manager

TABLE OF CONTENTS

TABLES

FIGURES

APPENDICES

A Well Inspections and Construction Information

B Lab Reports, November through December 2016 (Provided on CD Only with Hard Copy Submittal)

C Chromium, Molybdenum, Nitrate, and Selenium Concentration Graphs

D Other Groundwater Monitoring Results

E Hydraulic Data for Interim Measures Reporting Period

F Groundwater Monitoring Data for Groundwater Monitoring Program and Performance Monitoring Program

G Interim Measures Extraction System Operations Log, Fourth Quarter 20156

ACRONYMS AND ABBREVIATIONS

δ^2H	deuterium
$\delta^{18}O$	oxygen-18, stable isotope of oxygen
µg/L	micrograms per liter
ADEQ	Arizona Department of Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COPC	Constituent of potential concern
Cr(VI)	hexavalent chromium
CWG	Consultative Work Group
DOI	U.S. Department of the Interior
DTSC	California Environmental Protection Agency, Department of Toxic Substances Control
ft/ft	foot or feet per foot
GMP	Groundwater Monitoring Program
gpm	gallons per minute
IM	interim measure
IM-3	Interim Measures Number 3
IMCP	Interim Measures Contingency Plan
MCL	maximum contaminant level
mg/L	milligrams per liter
MS/MSD	matrix spike/matrix spike duplicate
ORP	oxidation-reduction potential
PG&E	Pacific Gas and Electric Company
PMP	Performance Monitoring Program
QC	quality control
RCRA	Resource Conservation and Recovery Act
RMP	Surface Water Monitoring Program
T22	Title 22
TDS	total dissolved solids
USBR	United States Bureau of Reclamation
USEPA	United States Environmental Protection Agency

UTL	upper tolerance limit

EXECUTIVE SUMMARY

This combined quarterly and annual report documents the monitoring activities and performance evaluation of the interim measure (IM) hydraulic containment system under the IM Performance Monitoring Program, the Groundwater Monitoring Program, and Surface Water Monitoring Program for the Topock Project. Hydraulic and chemical monitoring data were collected and used to evaluate the IM hydraulic containment system performance based on a set of standards approved by the California Department of Substances Control (DTSC). Key items included in this report are: (1) measured groundwater elevations and hydraulic gradient data at compliance well pairs that indicate the direction of groundwater flow is away from the Colorado River and toward the pumping centers on site; (2) hexavalent chromium data for monitoring wells; (3) pumping rates and volumes from the IM extraction system; and (4) Groundwater Monitoring Program and Surface Water Monitoring Program activities and results.

Based on the data and evaluation presented in this report, the IM performance standard has been met for the Fourth Quarter 2016 and Annual Reporting Period. The average pumping rate for the IM extraction system over Fourth Quarter 2016 was 134.9 gallons per minute, and an estimated 78.8 pounds (35.8 kilograms) of chromium were removed between October 1, 2016 and December 31, 2016. To date, the IM extraction system has removed 8,800 pounds (3,990 kilograms) of chromium.

1 INTRODUCTION

Pacific Gas and Electric Company (PG&E) is implementing Interim Measures (IMs) to address chromium concentrations in groundwater at the Topock Compressor Station (the site). The Topock Compressor Station is located in eastern San Bernardino County, 15 miles southeast of the City of Needles, California, as shown on Figure 1-1.

This report presents the monitoring data from three PG&E monitoring programs:

- Site-wide Groundwater Monitoring Program (GMP)
- Site-wide Surface Water Monitoring Program (RMP)
- Interim Measures No. 3 (IM-3) Performance Monitoring Program (PMP).

This report presents the monitoring data collected from PG&E's GMP, RMP, and PMP between November 1, 2016 and December 31, 2016 (hereafter referred to as **Fourth Quarter 2016**).

In addition, this report serves as an annual report and provides a summary of groundwater and surface water monitoring results for samples collected between January 1, 2016 and December 31, 2016 (hereafter referred to as the **Annual Reporting Period)** under the Topock GMP, RMP, and PMP programs. Table 1-1 shows the current reporting schedule for these programs.

This report is divided into eight sections:

Section 1 introduces the site: the GMP, RMP, and PMP programs; and the regulatory framework.

Section 2 describes the Fourth Quarter 2016 monitoring activities and site operations conducted in support of these programs.

Section 3 presents GMP and RMP monitoring results for the Fourth Quarter 2016 (November and December) and Annual Reporting Period.

Section 4 presents PMP monitoring results and the IM evaluation for the Fourth Quarter 2016 (November and December) reporting period.

Section 5 presents the PMP IM evaluation for the Annual Reporting Period.

Section 6 describes upcoming monitoring events for the First Quarter 2017.

Section 7 provides recommendations regarding future monitoring activities.

Section 8 lists the references cited throughout this report.

This combined GMP (including RMP) and PMP reporting format was approved by the California Environmental Protection Agency DTSC in May 2009 (DTSC 2009a).

1.1 Recent Regulatory Action

- On June 27, 2014, DTSC approved changes to the GMP sampling schedule, sample frequencies, and sampling methods (DTSC 2014b). This approval was based on recommendations documented in the Fourth Quarter 2013 and Annual edition of the Interim Measures Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report (henceforth referred to as the GMP/PMP Report; CH2M Hill 2014a). Starting in Third Quarter 2014, the groundwater sample collection method for most monitoring wells was conditionally switched from the traditional three-volume method to the low-flow (minimal drawdown) method (following the standard operating procedures detailed in the Sampling and Analysis Field Procedures Topock Program Manual, Revision 1, PG&E, Topock Project [CH2M Hill 2005a] and relevant updates).
- An updated listing of DTSC-approved purge methods and sampling frequencies, as well as a revised set of proposed GMP analytical suite modifications, was provided in Table 7-1 of the Fourth Quarter 2014 and Annual GMP/PMP Report (CH2M Hill 2015a). PG&E outlined additional recommendations for updates to the GMP program sampling methods in a letter to DTSC dated August 21, 2015 (PG&E 2015) and in Section 7 of the Fourth Quarter 2015 and Annual GMP/PMP Report (Arcadis 2016a). Recommendations made by PG&E in these documents remain under agency review.
- On June 29, 2015, the Arizona Department of Environmental Quality (ADEQ) recommended that PG&E increase the sampling frequency of MW-55-120 from semiannually to quarterly (ADEQ 2015). This was initiated by PG&E in Third Quarter 2015. On May 18, 2016, ADEQ recommended that quarterly sampling at MW-55-120 be extended for an additional year “where data are within the prescribed hold time and analyzed by an ADHS-certified lab (ADEQ 2016).” This was initiated by PG&E in Second Quarter 2016. Quarterly sampling is planned to continue through at least First Quarter 2017 at this location. Results of sampling at MW-55-120 will be evaluated following the First Quarter 2017 sampling event, and a new sampling frequency will be proposed in the First Quarter 2017 edition of this report.
- On July 20, 2015, DTSC conditionally approved a proposal to evaluate a modification to the IM-3 pumping regime by allowing PE-01 to be shut off with pumping shifted to TW-03D and TW-02D or

TW-02S so long as gradient targets are maintained and contingency is not triggered based on hexavalent chromium [Cr(VI)] concentrations in select floodplain wells (DTSC 2015). Because PE-01 pumps water with low concentrations of chromium (typically less than 5 micrograms per liter [µg/L]), shifting the flow from this well to a higher concentration extraction well can increase the rate of chromium removal from the floodplain. After a brief period of testing hydraulic gradients and operating the IM-3 treatment plant with PE-01 off in August and September 2015, PE-01 pumping resumed in September 2015 and remained on through the end of the year. On February 3, 2016, PE-01 was turned off, with the pumping shifted to TW-03D and supplemented by TW-02D. PE-01 remained off through Second Quarter 2016 except for brief periods to support groundwater sample collection and one week in June, when it was operated to help maintain key well gradients.

- As part of the conditional approval for PE-01 shutoff, GMP monitoring results from wells listed in the July 20, 2015 DTSC approval letter are compared to the maximum Cr(VI) and dissolved chromium concentrations measured in 2014 (or for biennial sampling frequency, the 2013 maximum concentrations), and results that exceed the previous maximum are required to be reported to DTSC within 40 days after the end of the quarterly GMP sampling event. This notification for Second Quarter GMP sampling results was made to DTSC on June 15, 2016 (with a follow-up email for one additional notification sent on August 10, 2016). DTSC replied to PG&E's initial Second Quarter notification with an email on June 15, 2016. DTSC confirmed that monitoring and assessment should continue to evaluate concentration trends, and requested that future notifications be provide in the same format as the Second Quarter submittal.
- PE-01 was run intermittently during Third Quarter 2016 to maintain landward gradients, with run time increasing as the river level began to decrease during the fall. There were no exceedances of historical maximums observed during Third Quarter 2016, and no notifications to DTSC were required.
- TW-03D (installed as part of IM-3 with optimized well and screen placement) operated full-time during 2016 except during brief periods of downtime for maintenance. PE-01 was run intermittently during Fourth Quarter 2016 to maintain landward gradients. Four of 46 wells monitored as part of the ongoing approval for conditional PE-01 shut-down (DTSC 2015) exceeded their 2014 maximums for Cr(VI) in Fourth Quarter 2016. The required notification for these exceedances was sent to DTSC on January 23, 2017 (Arcadis 2017) within the required 40-day timeframe from the end of the sampling event. TW-02S and TW-02D (predecessor extraction wells to TW-03D now used as backup or supplemental extraction wells) did not run during Third or Fourth Quarter 2016 except for brief periods of testing and sampling.

1.2 History of Groundwater Impact at the Site

1.2.1 Cr(VI) impacts to Groundwater

The Topock Compressor Station began operations in 1951. Remediation efforts are ongoing to address Cr(VI) in soil and groundwater resulting from the historical water discharge practices. A comprehensive library documenting the history of remediation at the Topock Compressor Station is available on the DTSC website at http://dtsc-topock.com/ (DTSC 2017).

1.2.2 Background Concentrations of Cr(VI)

Based on a regional study of naturally occurring metals in groundwater and a statistical evaluation of these data (CH2M Hill 2009a), naturally occurring Cr(VI) in groundwater was calculated to exhibit an upper tolerance limit (UTL) concentration of 32 µg/L. This concentration is used as the background concentration for remedial activities. At the site, the Cr(VI) plume is mostly present within unconsolidated alluvial fan and fluvial deposits (within the alluvial aquifer) and, to a lesser extent, in fractured bedrock. Natural groundwater gradients are generally west-to-east at the majority of the site. The depth to groundwater and the thickness of the saturated sediments vary significantly across the site based on surface topography and the paleo-topography of the top of bedrock surface underneath the site.

1.3 Site-wide Groundwater and Surface Water Monitoring Programs

1.3.1 Basis for GMP and RMP Programs

The Topock GMP and RMP were initiated as part of a Resource Conservation and Recovery Act (RCRA) and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) facility investigation/remedial investigation groundwater investigation. The RCRA program is being regulated under a Corrective Action Consent Agreement issued by the DTSC in 1996 for the Topock site (United States Environmental Protection Agency [USEPA] ID No. CAT080011729).

Groundwater monitoring data collected to date have been documented in regular monitoring reports (available on the DTSC website). In addition, data from between July 1997 and October 2007 are summarized in the Revised Final RCRA Facility Investigation/Remedial Investigation Report, Volume 2–Hydrogeologic Characterization and Results of Groundwater and Surface Water Investigation, Pacific Gas and Electric Company, Topock Compressor Station, Needles, California, dated February 11, 2009 (CH2M Hill 2009a). Additional groundwater and surface water monitoring data from November 2007 through September 2008 are presented in the Final RCRA Facility Investigation/Remedial Investigation Report, Volume 2 Addendum–Hydrogeologic Characterization and Results of Groundwater and Surface

Water Investigation, Pacific Gas and Electric Company, Topock Compressor Station, Needles, California, dated June 29, 2009 (CH2M Hill 2009b).

In compliance with the requirements for Groundwater and Surface Water Monitoring Program directive of April 2005 (DTSC 2005a), this report presents the Fourth Quarter 2016 and Annual GMP and RMP Report for the IM monitoring activities conducted from November 1, 2016 through December 31, 2016.

1.3.2 GMP and RMP Sampling Networks

The GMP monitoring well network and RMP surface water sampling network are shown on Figures 1-2 and 1-3, respectively, and summarized below. The complete GMP network includes more than 100 wells that monitor groundwater in the alluvial aquifer and bedrock, and the RMP includes 16 surface water monitoring locations.

GMP Groundwater Monitoring Wells	RMP Surface Water Monitoring Locations
129 monitoring wells in California, including two normally dry wells	10 river channel locations
8 monitoring wells in Arizona	4 shoreline locations
2 water supply wells	2 other surface water sampling locations (adjacent to the shoreline)
2 IM-3 extraction wells	
5 test wells	

The well construction and sampling methods for wells in the GMP and other monitoring wells at the site are summarized in Appendix A, Table A-1.

1.4 Interim Measure Performance Monitoring Program

1.4.1 Basis for PMP Program

In compliance with the requirements for IM monitoring and reporting outlined in the DTSC IM performance directive of February 2005 and in subsequent directives from the DTSC in 2007 (DTSC 2005b, 2007a-c), this report presents the Fourth Quarter 2016 PMP evaluation results for the IM monitoring activities from November 1, 2016 through December 31, 2016.

The Topock IM project consists of groundwater extraction for hydraulic control of the plume boundaries in the Colorado River floodplain and management of extracted groundwater. The groundwater extraction, treatment, and injection systems are collectively referred to as IM-3. The IM monitors only the Alluvial Aquifer. Currently, the IM-3 facilities include a groundwater extraction system (four extraction wells: TW-02D, TW-03D, TW-02S, and PE-01), conveyance piping, a groundwater treatment plant, and an injection well field for the discharge of the treated groundwater. During Fourth Quarter 2016, extraction wells TW-03D and PE-01 operated at a combined pumping rate of 134.9 gallons per minute (gpm), including periods of planned and unplanned downtime. Figure 1-1 shows the locations of the IM-3 extraction, conveyance, treatment, and injection facilities.

In a letter dated February 14, 2005, DTSC established the criteria for evaluating the performance of the IM (DTSC 2005c). As defined by DTSC, the performance standard for this 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). A Draft Performance Monitoring Plan for Interim Measures in the Floodplain Area, Pacific Gas and Electric Company, Topock Compressor Station, Needles, California (CH2M Hill 2005b) was submitted to DTSC on April 15, 2005 (herein referred to as the Performance Monitoring Plan).

The February 2005 DTSC directive also defined the monitoring and reporting requirements for the IM (DTSC 2005b-c). In October 2007, DTSC modified the reporting requirements for the PMP (DTSC 2007a) to discontinue monthly performance monitoring reports (the quarterly and annual reporting requirements were unchanged). The DTSC approved additional updates and modifications to the PMP in letters dated October 12, 2007; July 14, 2008; July 17, 2008; July 23, 2010, and June 27, 2014 (DTSC 2007a, 2008a-b, 2010a, 2014b). On July 20, 2015, DTSC conditionally approved the proposal to modify the IM-3 pumping regime by allowing PE-01 to be shut off and pumping to be shifted to TW-03D and TW-02D or TW-02S so long as gradient targets are maintained (DTSC 2015). Because PE-01 pumps water with low concentrations of chromium (typically less than 5 µg/L), shifting more pumping to a higher concentration extraction well can increase the rate of chromium removal from the floodplain. On February 3, 2016, PE-01 was turned off, with the pumping shifted to TW-03D and supplemented by TW-02D. PE-01 remained off through Second Quarter 2016, but was run intermittently during Third Quarter and Fourth Quarter 2016 to help maintain groundwater gradients at key wells. TW-02S and TW-02D did not run during Third or Fourth Quarter 2016 except for brief periods of testing and sampling. TW-03D operated full time in 2016.

1.4.2 PMP – Aquifer Hydraulics

The PMP monitors hydrogeologic conditions in the Alluvial Aquifer. The wells screened in the unconsolidated alluvial fan and fluvial deposits, which comprise the Alluvial Aquifer, have been separated into three depth intervals to present groundwater quality and groundwater level data. The depth intervals of the Alluvial Aquifer in the floodplain area—designated upper (shallow wells), middle (mid-depth wells), and lower (deep wells)—are based on grouping the monitoring wells screened at common elevations. These divisions do not correspond to any lithostratigraphic layers within the aquifer. The Alluvial Aquifer is considered to be hydraulically undivided. The subdivision of the aquifer into three depth intervals is an appropriate construct for presenting and evaluating spatial and temporal distribution of groundwater quality data in the floodplain. The three-interval concept is also useful for presenting and evaluating lateral gradients while minimizing effects of vertical gradients and observing the influence of pumping from partially penetrating wells.

1.4.3 PMP Monitoring Network

Figure 1-4 shows the locations of wells used for the performance monitoring program. The PMP includes data collection for hydraulic gradient measurements, IM chemical performance monitoring, IM groundwater extraction, and the IM Contingency Plan (IMCP). With approval from DTSC, the list of wells included in the PMP was modified beginning August 1, 2008 (PG&E 2008). The PMP wells and monitoring locations are described in the table below.

PMP Wells and Monitoring Locations
IM Extraction Wells (4 Wells) • TW-02D • TW-03D • TW-02S • PE-01
Hydraulic Monitoring Network – 53 Wells Total (including 17 shallow, 14 intermediate, and 22 deep) • Floodplain wells: monitoring wells on the Colorado River floodplain • Intermediate wells: monitoring wells immediately north, west, and southwest of the floodplain • Interior wells: monitoring wells upgradient of IM pumping
IMCP Wells (24 Wells) • 6 Shallow Wells • 5 Intermediate Wells • 13 Deep Wells
Chemical Performance Monitoring Locations (11)

- 9 Annual Wells
- 1 River Sampling Location
- 1 Biennial Well
-

1.4.3.1 IM Extraction Wells

The PMP Program includes four IM extraction wells (Figure 1-4). Three wells (TW-02D, TW-03D, and TW-02S) are located on the MW-20 bench (Figure 1-1), and one well (PE-01) is located on the floodplain approximately 450 feet east of extraction well TW-03D. The MW-20 bench is a level area next to National Trails Highway where some IM3 facilities are located.

1.4.3.2 IM Hydraulic Monitoring Network

The IM Hydraulic Monitoring Network consists of 53 wells (shown on Figure 1-4) used to evaluate the performance of the IM and demonstrate compliance of required hydraulic gradients. Section 4.7 of this report presents a summary of the IM hydraulic monitoring results for Fourth Quarter 2016.

In addition to the established IM hydraulic monitoring network, groundwater monitoring wells installed on the Arizona side of the Colorado River (not formally part of the PMP) also provide groundwater elevation data and demonstrate hydraulic gradients on the Arizona side of the river (Figure 1-4).

1.4.3.3 IM Contingency Plan Wells

Twenty-four IMCP wells have been selected as part of an early detection system to detect any increases in chromium concentrations at areas of interest at the site. Following a sampling event, any sampled IMCP wells are evaluated against their established trigger levels. If any exceedances are observed, a notification process is initiated as outlined in the Revised Contingency Plan Flow Chart (Figure 1; PG&E 2008). Results of IMCP well evaluations following Fourth Quarter 2016 sampling are presented in Section 4.3 of this report.

1.4.3.4 IM Chemical Performance Monitoring Wells

The well network is sampled annually or biennially for an expanded chemistry suite as part of the IM Chemical Performance Monitoring Network, which was most recently amended in 2008 (PG&E 2008). Currently, nine wells are sampled annually as part of this program, one well is sampled biennially, and one river location is sampled annually. Results of chemical performance monitoring were last reported in the Fourth Quarter 2015 Annual GMP-PMP Report (Arcadis 2016a). Results of the 2016 chemical performance monitoring evaluation are presented in Section 5.3.2 of this report.

1.4.3.5 Wells Monitored for Conditional Shut-Down of PE-01

As part of the conditional approval for PE-01 shutoff, GMP monitoring results from wells listed in the July 20, 2015 DTSC approval letter are compared to the maximum Cr(VI) and dissolved chromium concentrations measured in 2014 (or for biennial sampling frequency, the 2013 maximum concentrations), and results that exceed the previous maximum are required to be reported to DTSC within 40 days after the end of the quarterly GMP sampling event. Results for this evaluation for Fourth Quarter 2016 are presented in Section 4.3.2.

1.5 Sustainability

The GMP, RMP, and PMP monitoring programs strive to use sustainable sampling and data collection practices. This section briefly describes some of the sustainability practices now in use.

As approved by the California Regional Water Quality Control Board in 2006, groundwater sampling purge water is disposed via the on-site IM-3 treatment plant and injection process, eliminating off-site transport and disposal of sampling purge water. Additionally, the RMP boat contractor has always been a local Lake Havasu City-based business. Benefits of employing local resources for sampling support are reduced fuel consumption and greenhouse gas emissions, and increased local business support. In 2012, the analytical laboratory services supporting Topock monitoring was changed from a Los Angeles-based lab to the current California-certified Las Vegas-based lab, reducing lab courier travel by more than half. In 2007, DTCS approved the use of USEPA Method 218.6, which has a 28-day holding time, in place of USEPA Method SW846 Method 7199 for Cr(VI) analysis, which has a 24-hour holding time. Subsequently, PG&E also adopted the 14-day holding time nitrate method for Topock to replace the previous 48-hour holding time method. These method changes reduced courier travel mileage and increased field efficiency with less frequent sample pickups. The use of the DTSC website and electronic report submittal has reduced the number of report hard copies and conserved natural resources. The number of report hard copies has been reduced over the years from 16 to 10 for the quarterly reports and from 18 to 12 for the annual reports to conserve resources.

To reduce the potential for impacts to floodplain areas with nesting habitat for sensitive avian species, water level data telemetry systems were installed from 2011 through 2012 at the five key gradient compliance well locations. The telemetry systems are still currently used. The solar-powered data telemetry systems eliminated the need for weekly download visits (reduced mobilizations of off-site technical support resources) and allows for monthly or less frequent visits for key well transducer calibrations and maintenance.

The DTSC approved the provisional use of low-flow sampling on June 27, 2014 (DTSC 2014b) at most alluvial screened wells. Low-flow sampling reduced the volume of purge water and sampling footprint at most wells. For wells still using the three-volume purge sampling methods (primarily bedrock and long screened wells), pumps and tubing are sized for the optimum purge technique at each monitoring well. Utility vehicles (for example, Polaris Ranger or Kawasaki Mule) and one quiet electric four-wheel-drive utility vehicle are used to access wells on the floodplain and in some culturally sensitive areas rather than the full-size pickup truck. These best practices reduce generator use, impacts from well access, and decontamination water volume to further decrease the monitoring footprint.

More recently, on July 20, 2015, DTSC conditionally approved a modification to the IM-3 pumping regime by allowing PE-01 to be periodically shut off with pumping shifted to TW-03D and TW-02D or TW-02S. When applied, this modification allows for an increase in the rate of chromium removal from the floodplain, thereby extending the benefit of additional mass removal by the existing system to the overall site cleanup while maintaining hydraulic control of the plume.

2 FOURTH QUARTER 2016 MONITORING ACTIVITIES AND GMP ALTERNATIVE SAMPLING METHODS ANALYSIS

This section summarizes the monitoring and sampling activities completed during Fourth Quarter 2016 for the GMP, RMP, and PMP. This section also includes results of sampling method trials at select wells.

2.1 Groundwater Monitoring Program

2.1.1 Monthly Sampling

Groundwater was sampled from the active IM extraction wells (PE-01 and TW-03D) in November and December 2016 and was analyzed for Cr(VI), dissolved chromium, total dissolved solids (TDS), pH, and several additional analytes.

2.1.2 Quarterly/Annual Sampling

The Fourth Quarter 2016 GMP groundwater monitoring event was conducted between December 5 and December 15, 2016, and included sampling from 139 groundwater monitoring wells.

Samples from these wells were submitted for laboratory analysis of Cr(VI), dissolved chromium, and specific conductance. Additional field-measured parameters consisted of oxidation-reduction potential (ORP) and pH.

In addition, groundwater samples were collected at selected GMP wells for analysis of:

- California Code of Regulations Title 22 (T22) metals analyses, which includes arsenic at six alluvial wells (MW-10, MW-12, MW-26, MW-44-115, MW-50-200, and MW-51)
- Arsenic from a subset of wells screened in fluvial sediments, as directed by DTSC in the Corrective Measures Study review comment No. 186 (DTSC 2009b)
- Arsenic from bedrock monitoring wells
- Constituents of potential concern (COPCs), including molybdenum, nitrate/nitrite as nitrogen (referred to as nitrate hereafter), selenium, and potential in situ byproducts (manganese, iron, and arsenic) from a subset of wells (DTSC 2010c, 2011, 2015).

As part of baseline sampling in support of the groundwater remedy design, select monitoring wells were analyzed for additional non-routine parameters during the Fourth Quarter 2016 monitoring event.

Sample analysis included chloride, sulfate, bromide, calcium, magnesium, potassium, sodium, boron, alkalinity, TDS, and stable isotopes of oxygen ($\delta^{18}O$) and deuterium ($\delta^{2}H$).

Results and conclusions from the Fourth Quarter 2016 and annual GMP monitoring are discussed further in subsequent sections with historical data where applicable.

2.1.3 Well Maintenance

PG&E performs quarterly inspections and takes corrective actions as necessary to ensure that the monitoring wells are in good working condition (DTSC 2013; CH2M HILL 2005a-b). Table A-1 in Appendix A summarizes the quarterly inspection log, field observations, and mitigation actions, if any, for well maintenance.

2.1.4 Implementation of Alternative Sampling Methods

2.1.4.1 Site-wide Implementation of Low-flow Sampling Method

On June 27, 2014, the DTSC approved a change from the traditional three-volume purge sampling method to using a low-flow sampling method (DTSC 2014b). This approval applied to wells screened in alluvial/fluvial sediments with saturated screen lengths of 20 feet or less. Sample collection using the low-flow method at wells meeting the screen length criterion was initiated during the Third Quarter 2014 sampling event and has continued through Fourth Quarter 2016.

2.1.4.2 Sampling Method Trials at Select Wells

In addition to the change to the sampling method, and in conformance with the June 27, 2014 email from DTSC (DTSC 2014b), PG&E began conducting sampling method trials at MW-38S, MW-38D, MW-40S, and MW-40D during Fourth Quarter 2014, and the trial continued through 2016. The purpose of the method trials is to directly compare two different sampling methods. At MW-38S and MW-38D, both low-flow and three-volume purge samples were collected for comparison at approved sampling intervals in 2016. At MW-40S, planned annual HYDRASleeve™ and low-flow samples were not collected in Fourth Quarter 2016 due to pending access approval in the highway right-of-way. Pending access approval, sampling will resume on the planned schedule in 2017. At MW-40D, HYDRASleeve™ and low-flow samples were collected for comparison during Second Quarter 2016, but were not collected during Fourth Quarter 2016 due to pending access approval in the highway right-of-way. Pending access approval, sampling will resume on the planned schedule in 2017. Results for Cr(VI) sampling to date at each well are shown in Table 2-1, with additional sampling parameter results provided in Table D-5 (Appendix D).

At MW-38S, results for both low-flow and three-volume pure samples were non-detect (or low concentration detections) through nine sampling events from Fourth Quarter 2014 to Fourth Quarter 2016. For this reason, Section 7 of this report includes a recommendation that MW-38S be removed from the comparison method trial and sampled by only the low-flow method moving forward. This recommendation was also made in last year's annual report (Arcadis 2016a), currently under agency review.

At MW-38D, results for low-flow and three-volume pure samples were consistent with each other through five semi-annual monitoring events from Fourth Quarter 2014 to Fourth Quarter 2016. These results show that low-flow sampling is providing results comparable to three-volume sampling. Section 7 of this report includes a recommendation that MW-38D also be removed from the comparison method trial and sampled by only the low-flow method moving forward. This recommendation was also made in last year's annual report (Arcadis 2016a), currently under agency review.

At MW-40S, while no samples were collected in 2016 (due to pending access approval in the highway right-of-way), results for low-flow and HYDRASleeve™ samples collected twice (annually in 2014 and 2015) were consistent between the two methods. These results suggest that HYDRASleeve™ sampling may be a viable sampling alternative at this location to low-flow sampling (three-volume purge sampling was not evaluated at MW-40S). Section 7 of this report includes a recommendation to continue the method trial sampling at this location, but increase the frequency to semiannual to collect more data for the method trial in 2017. This recommendation was also made in last year's annual report (Arcadis 2016a), currently under agency review.

At MW-40D, results for low-flow and HYDRASleeve™ samples were consistent for two of three semiannual sampling events between Fourth Quarter 2014 and Fourth Quarter 2015, with the HYDRASleeve™ reading non-detect for one event where low-flow yielded a detection of 120 µg/L. In 2016, the low-flow and HYDRASleeve™ results were 130 and 120 µg/L, respectively, during the Second Quarter (semi-annual) sampling event; however, planned sampling for Fourth Quarter was not completed pending access approval in the highway right-of-way. These results suggest that HYDRASleeve™ sampling may be a viable alternative at this location to low-flow sampling; however, additional sampling is needed to complete the evaluation. Section 7 of this report includes a recommendation to continue the method trial sampling at this location in 2017 with no change.

2.2 Surface Water Monitoring Program

Quarterly surface water sampling was conducted November 29 through 30, 2016 from the RMP monitoring network. Samples were analyzed for Cr(VI), dissolved chromium, specific conductance, and pH. Samples were also analyzed for COPCs (molybdenum, nitrate, and selenium), in situ byproducts (manganese, iron, and arsenic), and geochemical indicator parameters (barium and total suspended solids) to develop baseline concentrations for future remedy performance evaluations.

2.3 Performance Monitoring Program

Groundwater samples for the PMP were collected during the Fourth Quarter 2016 GMP sampling event. In addition, PMP pressure transducers, which monitor hydraulic gradients of the alluvial aquifer, were downloaded in the first 2 weeks of each month (November and December). The transducers in the key monitoring wells (MW-27-085, MW-31-135, MW-33-150, MW-34-100, and MW-45-095; Figure 1-4) are also downloaded via a cellular telemetry system.

In accordance with DTSC conditional approval (DTSC 2015), PE-01 was shut off February 3, 2016, with the pumping shifted to TW-03D and supplemented by TW-02D. Conditional approval included the requirement that PG&E notify DTSC if chromium from individual floodplain monitoring wells within approximately 800 feet of TW-3D exhibited concentrations greater than the maximum detected chromium concentrations from 2014 (or most recent year if a well was not sampled in 2014) when PE-01 is shut down. While PE-01 did run intermittently during Fourth Quarter 2016 to maintain landward gradients, samples were still collected in accordance with the DTSC conditional approval letter. Four of the 46 wells monitored during the Fourth Quarter met the criteria where either Cr(VI) or total dissolved chromium (or both) was detected at concentrations exceeding the notification levels. DTSC was notified on January 23, 2017 (Arcadis 2017). A further discussion of these results is presented in Section 4.3.2 of this report.

3 RESULTS FOR SITE-WIDE GROUNDWATER MONITORING AND SURFACE WATER SAMPLING

This section presents the analytical results for groundwater and surface water monitoring conducted during Fourth Quarter 2016. In addition, this section summarizes the site-wide groundwater and surface water sample results for the 2016 Annual Reporting Period.

3.1 Groundwater Results for Cr(VI) and Dissolved Chromium

Table 3-1 presents the Fourth Quarter 2015 through Fourth Quarter 2016 groundwater sample results for Cr(VI) and dissolved chromium, among other parameters. The laboratory reports for samples analyzed during Fourth Quarter 2016 are provided in Appendix B.

3.1.1 Fourth Quarter Groundwater Results for Cr(VI) and Dissolved Chromium

Figures 3-1a through 3-1c present the Fourth Quarter 2016 Cr(VI) results in map view for wells monitoring the upper-depth (shallow wells), middle-depth (mid-depth wells), and lower-depth (deep wells) intervals, respectively, of the Alluvial Aquifer and bedrock. Figures 3-1a through 3-1c also show the interpreted extent of groundwater Cr(VI) concentrations higher than 32 µg/L for each depth interval. The value of 32 µg/L is based on the calculated natural background UTL for Cr(VI) in groundwater from the background study (CH2M Hill 2009a).

During Fourth Quarter 2016, the maximum detected Cr(VI) concentration was 38,000 µg/L in well MW-68-180 (Table 3-1). The maximum detected (total dissolved) chromium concentration was also in well MW-68-180 at 42,000 µg/L (Table 3-1).

3.1.2 Annual Evaluation of Groundwater Results for Cr(VI) and Dissolved Chromium

Appendix C presents graphs of Cr(VI) concentration versus time (Figures C-1 through C-19) for the GMP monitoring wells since the initiation of IM groundwater extraction in 2004. This section discusses observed qualitative trends in Cr(VI) concentrations through 2016 for wells that are not evaluated under the PMP (see also Section 5).

A review of Appendix C, Figures C-1 through C-19, reveals the following observed Cr(VI) trends. These observations are qualitative (i.e., based on visual review of the concentration plots), and are not quantified using statistical analysis. Cr(VI) and dissolved chromium results (see also Table 3-1) for the Arizona wells and Park Moabi (water production) wells are also discussed below.

Monitoring Well	Trend in Cr(VI) Concentrations
MW-14	All concentrations below 32 µg/L (Figure C-2).
MW-18	Declining concentrations from 2007 to 2010; stable since 2010 (Figure C-2).
MW-25	Steadily decreasing concentrations (Figure C-3).
MW-26	Initially decreasing concentrations; slightly increasing concentrations since 2013, which appear to have stabilized (Figure C-4).
MW-31 cluster	Initially decreasing concentrations; stable since 2009 with a slight increase (in MW-31-060) in 2015, although concentrations have since decreased (Figure C-4).
MW-37D	Decreasing concentrations beginning in 2006 to below 32 µg/L since December 2014 (Figure C-8).
MW-40D	Generally increasing concentrations from 2004 to 2011; since 2011, concentrations have generally decreased (Figure C-9).
MW-50-095	Decreasing concentrations from 2007 to 2011; currently stable below 32 µg/L (Figure C-12).
MW-50-200	Fluctuating but generally decreasing concentrations since 2007 (Figure C-12).
MW-62-110	Fluctuating but generally increasing concentrations until a decrease to non-detect in October 2015 (Figure C-14); concentrations have remained near or below the laboratory reporting limit since October 2015.
MW-65 cluster	Slightly increasing concentrations in MW-65-160; in MW-65-225, concentrations increased to a maximum in 2012 before generally decreasing, and another decrease was observed in September 2014 with the switch to low-flow sampling; since September 2014, concentrations in MW-65-225 have fluctuated (Figure C-15).
MW-66-165 and MW66BR-270	Stable concentrations since well cluster installation in 2011 (Figure C-16).
MW-66-230	Increasing concentrations from 2011 to 2013; fluctuating concentrations since 2013 with a maximum of 7,700 µg/L in December 2015; concentrations have decreased since December 2015 (Figure C-16).
MW-67 cluster	Initial increasing concentrations in 2011 but generally stable or decreasing (MW-67-185) since January 2012; concentration decrease observed in MW-67-260 since January 2012 (Figure C-16).
MW-68-180	General overall increasing trend with seasonally fluctuating concentrations (higher in fall/winter, lower in spring); the maximum Cr(VI) concentrations observed in site groundwater have been detected in this well (Figure C-16).
MW-68-240	Generally stable concentrations since 2012 (Figure C-16). Concentrations at MW-68BR-280 have been non-detect since the well was installed.
MW-69-195	Increasing concentrations from 2011 to early 2013; generally stable between 2013 and May 2015. A decreasing trend was observed between May 2015 and February 2016, but concentrations have stabilized since (Figure C-17).
MW-70-105	Fluctuating but generally stable concentrations since 2013 (Figure C-17).

Monitoring Well	Trend in Cr(VI) Concentrations
MW-70BR-225	Fluctuating but generally stable concentrations since 2013 (Figure C-17).
MW-54 cluster, MW-55 cluster, and MW-56 cluster (Arizona wells)	In 2016, Cr(VI) and dissolved chromium were non-detect in seven of eight wells with MW-55-120 being the exception. For MW-55-120: • Dissolved chromium and Cr(VI) concentrations have gradually increased since 2008, reaching maximums of 10.6 and 11.1 µg/L, respectively, in May 2016. Concentrations have since stabilized. - The current chromium concentration is well below the federal drinking water standard (maximum contaminant level [MCL] of 100 µg/L) and Arizona's Aquifer Water Quality Standard of 50 µg/L. - Concentrations are consistent with regional background concentrations. • Increasing dissolved chromium and Cr(VI) trends at MW-55-120 may be a result of geochemical conditions near the well screen slowly returning to equilibrium conditions with the aquifer since initial well installation disturbance.
Park Moabi-3 (PM-03) and Park Moabi-4 (PM-04) (water production wells)	In PM-03, Cr(VI) and dissolved chromium were both detected at a concentration of 9.4 µg/L in December 2016. In PM-04, Cr(VI) and dissolved chromium were detected at concentrations of 4.9 and 4.4 µg/L, respectively, in December 2016. These concentrations were less than the California MCLs for Cr(VI) and total chromium of 10 µg/L and 50 µg/L, respectively.

3.2 Other Groundwater Monitoring Results

Table 3-2a presents the COPCs (molybdenum, nitrate, and selenium) and in situ byproducts (arsenic and manganese) sampling results for groundwater monitoring well samples collected in 2016. The Fourth Quarter 2016 data presented in Table 3-2a are summarized in Table 3-2b. Field parameter data and additional water quality results are provided in Appendix D.

3.2.1 Constituents of Potential Concern and In Situ Byproducts

Figures 3-2a through 3-2e present the molybdenum, nitrate (as N), selenium, arsenic, and manganese results for Fourth Quarter 2016, respectively. Results were compared to the background UTLs calculated and reported in CH2M Hill 2009a and MCLs where available. Background UTLs were only calculated for regional alluvial wells during the background study; therefore, these background UTLs may not be appropriate for bedrock wells.

Graphs of the concentrations of molybdenum, nitrate (as N), and selenium over time are presented in Appendix C. Results for in situ byproducts and geochemical indicator parameters are presented in Tables 3-2a and 3-2b and in Table D-1 in Appendix D. An evaluation of in situ byproduct sample results for floodplain wells with additional geochemical parameters collected for annual PMP performance monitoring is presented in Section 5.3.2. Below is a summary of results for molybdenum, nitrate (as N), selenium, and manganese in Fourth Quarter 2016 (arsenic is discussed in Section 3.2.2).

Constituent (# of wells sampled)	Calculated Background UTL (#exceedances in Q4 2016)	MCL (#exceedances in Q4 2016)	Highest Detected Concentration (Location)
Molybdenum (133)	36.3 µg/L (51)	None (NA)	450 µg/L (MW-33-040)
Nitrate as N (81)	5.03 mg/L (18)	10.0 µg/L (12)	77 mg/L MW-67-185)
Selenium (133)	10.3 µg/L (23)[2]	50 µg/L (2)	340 µg/L (MW-67-185)
Manganese (136)	None (NA)	50 µg/L (NA)[3]	5,600 µg/L (PGE-07BR)

Notes:

[1] Nitrate samples were analyzed using USEPA Method 4500NO3, except for TW-03D and PE-01, which were analyzed using USEPA Method 300.0. USEPA Method 4500NO3 reports a combination of nitrate and nitrite as nitrogen. The contribution of nitrite to the reported result of nitrate plus nitrite as nitrogen is expected to be negligible; therefore, sample results for USEPA Method 4500NO3 are expected to be essentially the same as previous samples analyzed using USEPA Method 300.0 and reported as nitrate as nitrogen.

[2] Includes non-detects with reporting limits higher than 10.3 µg/L.

[3] This is a secondary MCL.

Throughout the 2016 reporting period molybdenum, selenium, and nitrate were within historical ranges.

3.2.2 Arsenic Sampling in Monitoring Wells

Eighty-five fluvial/alluvial and 26 bedrock wells were sampled for arsenic in Fourth Quarter 2016. Highlights of the results (Tables 3-2a and 3-2b) are as follow.

Well Type (# of wells sampled)	Calculated Background UTL (#exceedances in Q4 2016)	MCL (# exceedances in Q4 2016)	Highest Detected Concentration (Location)
Alluvial/Fluvial (85)	24.3 µg/L (3)	10 µg/L (11)	41 µg/L (MW-12)
Bedrock (26)	24.3 µg/L (---)	10 µg/L (5)	17 µg/L (MW-57-185 and MW-72BR-200)

Note:

[1] The California MCL for arsenic is 10 µg/L. The background study UTL for arsenic is 24.3 µg/L.

--- = not applicable

Additional arsenic results are presented in Appendix D, Table D-1. Arsenic concentrations were within expected ranges for the 2016 reporting period at the wells sampled.

3.2.3 Title 22 Metals

Table 3-3 presents the T22 metals results for the GMP monitoring wells MW-10, MW-12, MW-22, MW-26, MW-44-115, MW-50-200, and MW-51, sampled during Fourth Quarter 2016 or previous 2016 monitoring events. The concentrations of T22 metals detected in these monitoring wells remained generally stable overall during the Annual Reporting Period.

3.2.4 Laboratory-Specific Conductance Results

Laboratory-specific conductance results for the 2016 reporting period are presented in Table 3-1. The salient trend in specific conductance is a correlation of lower specific conductance over time at floodplain wells with an increasing river water isotopic signature. This is interpreted to indicate that IM-3 pumping has been drawing river water into the floodplain groundwater (see Section 5.3.2). For wells adjacent to the Colorado River, generally more of a river water signature (based on specific conductance) has been historically observed during the summer months when river levels are higher.

3.2.5 Water Level Monitoring

Table D-2 in Appendix D presents the manual water level measurements and salinity data collected at IM-3 monitoring locations during the 2016 Annual Reporting Period. Groundwater salinity during Fourth Quarter 2016 ranged from 0.06 percent (MW-27-020, MW-28-025, MW-34-055, and MW-74-240) to 1.81 percent (well MW-22), consistent with results of prior monitoring. Due to the variation in groundwater salinity at the site, the groundwater elevations measured in the monitoring wells have been adjusted (normalized) to an equivalent freshwater head (Fetter 1994).

Figure 3-3 presents the groundwater elevation contours for the shallow-depth interval of the Alluvial Aquifer, representative of the water table. A site-wide water level survey was conducted on December 9, 2016, involving the manual collection of groundwater level data at 25 shallow wells within an approximate 2-hour period. Because groundwater levels at the site fluctuate continuously in response to changes in the river stage, these groundwater elevation contours are affected by transient conditions during the period of measurement and may not be representative of the average groundwater gradient directions.

3.3 Surface Water Results for Cr(VI) and Dissolved Chromium

During the 2016 Annual Reporting Period (including sampling in Fourth Quarter 2016), Cr(VI) and dissolved chromium were not detected at concentrations higher than reporting limits at any surface water monitoring locations (Table 3-4).

Table 3-5 presents results for the COPCs (molybdenum, nitrate as N, and selenium), in situ byproducts (manganese, iron, and arsenic), and other geochemical indicator parameters in surface water for January to December 2016.

The C-MAR sample location is near the east side of the Colorado River at the mouth of the Topock Marsh area as shown on Figure 1-3. This location is outside of the main river channel and adjacent to an area of naturally reducing geochemical conditions in groundwater. Elevated manganese and iron concentrations are typical of reduced geochemical environments. These metals may also be occasionally detected in more oxidized environments due to the presence of suspended solids (colloids) in the filtered samples. This is likely the case for samples from R-19 and R-28 (adjacent to the site), and C-NR3 and C-NR4 (upstream of the site) in the main river channel (near the western shore) with elevated concentrations of dissolved iron.

3.4 Data Validation and Completeness

Laboratory analytical data from the Fourth Quarter 2016 sampling events were reviewed by project chemists to assess data quality and to identify deviations from analytical requirements.

The following bullets summarize the notable analytical qualifications in data reported for Fourth Quarter 2016:

- Eighteen Cr(VI) (USEPA Method 218.6) results exhibited a matrix interference issue that required a dilution to achieve satisfactory matrix spike (MS) recovery, resulting in an elevated reporting limit. No flags were applied.
- Dissolved calcium and dissolved magnesium were recovered at concentrations less than or greater than the quality control (QC) criteria in a few initial calibration verification standards. The associated results were qualified as estimated non-detects or estimated detects, flagged “UJ” or “J,” respectively.
- Boron/Dissolved boron was detected at concentrations below the reporting limit in a few continuing calibration blank analyses, resulting in a few associated samples requiring data qualification. The associated samples were qualified as non-detects at the measured concentration.

- Dissolved iron and sulfate were detected in one or more equipment blanks that resulted in qualification of associated sample data. The dissolved iron result in samples MW-27-020-Q416, MW-44-070-Q416, MW-46-175-Q416 and sulfate in samples MW-55-045-Q416 and MW-918-Q416 were qualified as non-detects at the measured concentration and flagged “U”.
- Dissolved iron was recovered at concentrations lower than QC limits in the MS and or matrix spike duplicate (MSD) of samples CW-01M-Q416 and MW-65-160-Q416. Additionally, the post-digestion spike in sample MW-38D-SMT-Q416 was recovered at a concentration greater than QC criteria for dissolved iron. The associated parent samples were qualified as estimated detects and flagged “J” accordingly.
- Dissolved lead was recovered at concentrations lower than QC limits in the MS and or MSD of samples CW-01M-Q416 and CW-02M-Q416. The associated parent samples were qualified as estimated non-detects and flagged “UJ” accordingly.
- Dissolved molybdenum was recovered at concentrations greater than QC limits in the MS and MSD of sample MW-65-160-Q416. The associated sample results were qualified as estimated detects and flagged “J”.
- Serial dilutions were not within QC criteria in the following sample/analytes: MW-38D-SMT-Q416 dissolved boron and dissolved magnesium; MW-39-060-Q416/dissolved sodium; MW-72-080-Q416/dissolved magnesium; Additionally, the post-digestion spike for dissolved magnesium was recovered less than QC limits in sample MW-38D-SMT-Q416. The associated results were qualified as estimated detects and flagged “J”.
- The associated TDS laboratory replicate relative percent difference exceeds QC criteria and samples; PGE-07BR-Q416, MW-41-Q416, MW-48-Q416, MW-53D-Q416, and MW-50-200-Q416 were qualified as estimated detects, flagged “J”.
- Dissolved boron and dissolved magnesium demonstrated relative percent differences greater than QC criteria for the field duplicate pair of samples MW-52S-Q416/MW-917-Q416. Dissolved sodium in the field duplicate pair of samples MW-11-Q416/MW-905-Q416. The associated results were qualified as estimated detects and flagged “J”.
- Based on the March 2007 USEPA ruling, and reaffirmed in the May 2012 USEPA ruling, pH has a 15-minute holding time. As a result, all samples analyzed in a certified lab by Method SM4500-HB (pH) are analyzed outside the USEPA-recommended holding time. Therefore, the pH results for the Fourth Quarter 2016 sampling events analyzed in a certified lab are considered estimated.

No other significant analytical deficiencies were identified in the Fourth Quarter 2016 data. Additional details are provided in the data validation reports kept in the project file and available upon request.

In addition, PG&E identified no “suspect” detections of Cr(VI) in surface water samples or any other “suspect” samples requiring reanalysis at the laboratory; therefore, in conformance with the agencies’ April 4, 2014 direction letter (DTSC 2014a), no notifications were made to DTSC and the United States Department of the Interior (DOI) with regards to “suspect” samples.

3.5 Summary of 2016 Groundwater Monitoring Program and Surface Water Monitoring Program Results

Key observations and data trends for this quarter and previous periods include the following:

- Chromium concentrations in many GMP monitoring wells near the floodplain and active extraction wells are stable or declining, with fluctuating and/or increasing concentrations present at some locations. Increasing concentrations are limited to wells located near the National Trails Highway that are under the hydraulic influence of active extraction well TW-03D.
- Concentrations in several of the East Ravine/Topock Compressor Station wells are generally fluctuating or stable with a few exceptions. Concentrations at bedrock well MW-62-110 have been fluctuating, but overall were increasing until a decrease to non-detect in October and December 2015, and have remained non-detect in 2016. Concentrations at MW-68-180 show a general overall increasing trend, with seasonal fluctuations, and are currently the highest of any well at the site (Figure C-16).
- During the 2016 reporting period, Cr(VI) and dissolved chromium were not detected at concentrations higher than reporting limits at any surface water monitoring locations.
- Molybdenum, selenium, and nitrate continue to be detected in a subset of monitoring wells at concentrations consistent with historical ranges (CH2M Hill 2009a-c).
- Fourteen arsenic concentrations among the 111 fluvial/alluvial and bedrock well samples exceeded the California MCL (10 μg/L), while five of these samples yielded results higher than the background study UTL of 24.3 μg/L.

4 FOURTH QUARTER INTERIM MEASURES PERFORMANCE MONITORING PROGRAM EVALUATION

This section presents the quarterly PMP evaluation summary for Fourth Quarter 2016.

4.1 Water Quality Results for Performance Monitoring Program Floodplain Wells

The chemical performance monitoring wells are sampled annually (one well sampled biennially) during the Fourth Quarter sampling events. Figure 1-4 shows the locations of the monitoring wells sampled for the performance monitoring parameters. In July 2008 and June 2014, DTSC approved modifications to the PMP IM chemical performance monitoring parameters (DTSC 2008b; 2014b).

Table F-1 in Appendix F presents the results of general chemistry and stable isotope analyses for 15 PMP monitoring wells and two river stations during sampling events from March 2005 through December 2016. These monitoring locations were selected to evaluate long-term trends in general water quality in response to IM groundwater extraction. Water samples from the selected performance monitoring locations are analyzed for general chemistry parameters, including TDS, chloride, sulfate, nitrate, bromide, calcium, potassium, magnesium, sodium, boron, alkalinity, $\delta^{2}H$, and $\delta^{18}O$, to monitor the effects of IM pumping on groundwater chemistry. Section 5.3.2.2 of this report provides an evaluation of the general chemistry groundwater data for the floodplain area.

4.2 Cr(VI) Distribution and Trends in Performance Monitoring Program Wells

The Fourth Quarter 2016 distribution of Cr(VI) in the upper (shallow wells), middle (mid-depth wells), and lower (deep wells) intervals of the Alluvial Aquifer is shown in plan view and cross-section view on Figure 4-1.[1] Figure 4-2 presents the Fourth Quarter 2016 Cr(VI) results for cross-section B, oriented parallel to the Colorado River. The locations of cross-sections A and B are shown on Figure 4-1.

---

[1] On Figures 4-1 and 4-2, the Cr(VI) concentrations are color-coded based on the groundwater background Cr(VI) concentration, which is 32 µg/L (CH2M Hill 2009a). The 20 µg/L and 50 µg/L Cr(VI) concentration contours presented on Figures 4-1 and 4-2 are shown in accordance with DTSC's 2005 IM directive and are not based on the background Cr(VI) concentration for groundwater.

Appendix C includes graphs of Cr(VI) concentration vs time in selected monitoring well clusters through December 2016. Analytical results for the 2016 Annual Reporting Period are presented in Table 3-1. An evaluation of chromium trends in PMP wells is presented in the annual performance evaluation in Section 5.3.

4.3 Performance Monitoring Program Contingency Plan Cr(VI) Monitoring

4.3.1 Chromium Concentrations in IMCP Wells

The Topock IMCP was developed to detect and control any possible migration of the Cr(VI) plume toward the Colorado River (DTSC 2005b). Currently, the IMCP consists of 24 wells that activate contingencies per criteria in the IMCP if their trigger levels are exceeded. The IMCP well Cr(VI) results from the Fourth Quarter 2016 and Annual Reporting Periods were all lower than their trigger levels. Appendix C includes Cr(VI) concentration graphs for the IMCP wells and select other site monitoring wells.

4.3.2 Chromium Concentrations in Wells Monitored for Conditional Shut-Down of PE-01

As discussed in Section 1.1, extraction well PE-01 was shut down in February 2016 and remained off through Second Quarter 2016 except for brief periods to support groundwater collection or to help maintain landward groundwater gradients at key wells. PE-01 was operated intermittently during Third and Fourth Quarter 2016.

Conditional approval for shut-down included the requirement that PG&E notify DTSC if chromium from individual floodplain monitoring wells within approximately 800 feet of TW-3D exhibited concentrations greater than the maximum detected chromium concentrations from 2014 (or the most recent year if a well was not sampled in 2014) when PE-01 is shut down.

During the Fourth Quarter monitoring event, four of the 46 wells monitored met the criteria where either Cr(VI) or total dissolved chromium (or both) was detected at concentrations exceeding the notification levels. These wells are MW-26, MW-47-055, MW-39-100, and MW-44-125. For the other 42 wells monitored in the Fourth Quarter, total dissolved chromium and Cr(VI) concentrations were below their notification levels and/or were non-detect. DTSC was notified of Fourth Quarter exceedances at the four wells on January 23, 2017 (Arcadis 2017).

At the four wells identified, Fourth Quarter 2016 chromium concentrations appear to be within expectations based on recent data trends/fluctuation. In addition, the concentrations of Cr(VI) at MW-44-125 and MW-47-055, and the concentration of total dissolved chromium at MW-44-125, while exceeding the maximum concentrations observed in 2014, remain within the range of site-wide natural background (<32 µg/L Cr[VI] and <28 µg/L total dissolved chromium). Results at locations in Fourth Quarter 2016 exceeding 2014 maximums are shown on trend plots provided with the notification letter to DTSC (Arcadis 2017). Due to ongoing remediation, concentrations continue to show a downward trend over time. Concentrations remain within expected ranges and are generally declining. Further, landward hydraulic gradients measured across the floodplain are consistent with gradients in previous years prior to the modification to the PE-01 pumping plan, as discussed in Section 5.2.2.

4.4 Extraction Systems Operations

From November 1, 2016 through December 31, 2016, the volume of groundwater extracted and treated by the IM-3 system was 11,848,020 gallons. An estimated 78.8 pounds (35.8 kilograms) of chromium were removed from the aquifer between October 1, 2016 and December 31, 2016 (Table 4-1).

During Fourth Quarter 2016, extraction wells TW-03D and PE-01 operated at a combined pumping rate of 134.9 gpm, including periods of planned and unplanned downtime. The average monthly pumping rates were 134.7 gpm (November 2016) and 135.0 gpm (December 2016) during the Fourth Quarter 2016. Extraction wells TW-02D and TW-02S were operated briefly during December 2016. The operational runtime percentage for the IM extraction system was 99.3 percent during this reporting period. Table 4-1 shows the average pumping rate and total volume pumped for the system during Fourth Quarter 2016 (and Annual reporting period), as well as monthly average pumping rates and total volumes pumped per extraction well during the quarter (and year). The operations log for the extraction system during Fourth Quarter 2016, including planned and unplanned downtime, is included in Appendix G.

The concentrate (i.e., saline water) from the reverse osmosis system was shipped off site as a non-hazardous waste and was transported to Liquid Environmental Solutions in Phoenix, Arizona for treatment and disposal. Four containers of solids from the IM-3 facility were disposed of at the U.S. Ecology Chemical Waste Management facility in Beatty, Nevada during Fourth Quarter 2016. Daily IM-3 inspections included general facility inspections, flow measurements, and site security monitoring. Daily logs with documentation of inspections are maintained on site.

During the Fourth Quarter 2016, Cr(VI) concentrations in primary extraction well TW-03D remained stable, ranging from a minimum value of 590 µg/L in November, to a maximum value of 630 µg/L in

December, as shown in Table 5-2. TDS concentrations in TW-3D for this reporting period have also remained stable, as shown in Table 5-2.

Cr(VI) concentrations in groundwater at extraction well PE-01 on the floodplain during Fourth Quarter 2016 ranged from a minimum of 1.2 µg/L in December to a maximum of 2 µg/L in November, as shown in Table 5-2. After being shut down in February, this well remained off for most of the Second Quarter, was run intermittently during Third and Fourth Quarters to maintain landward groundwater gradients at key wells. TDS concentrations in PE-1 for this reporting period have remained stable.

With increased use of extraction well TW-02D during First Quarter 2016, PG&E increased sampling frequency at this well from annual to quarterly starting in Second Quarter 2016. TW-02D was only run in Fourth Quarter 2016 for brief periods of sampling and testing. Sampling results at this well during the quarter were non-detect (0.2) µg/L for Cr(VI). Results will continue to be monitored at this location quarterly while this well remains in use for groundwater extraction.

Groundwater samples are currently collected annually at extraction well TW-02S. TW-02S was only run in Fourth Quarter 2016 for brief periods of sampling and testing. Sampling results at this well during the quarter showed 64 µg/L Cr(VI). The next round of sampling at this location is planned for Fourth Quarter 2017.

4.5 Hydraulic Gradient and River Levels during Quarterly Period

During the reporting period, water levels were recorded at intervals of 30 minutes with pressure transducers in 56 wells (excluding five Arizona locations) and two river monitoring stations (I-3 and RRB; Figure 4-3a). The data are typically continuous, with only short interruptions for sampling or maintenance. It should be noted that data from river monitoring station RRB were rejected for November and December of 2016, when river levels were too low to achieve proper readings at the RRB monitoring station.

Hydraulic gradients were measured during the Fourth Quarter 2016 for well pairs selected for performance monitoring of the two pumping centers (TW-03D and PE-01). Table 4-2 presents the monthly average hydraulic gradients measured for each of the gradient well pairs in November and December 2016 as well as the overall average of all well pairs. Strong landward gradients were measured each month. The overall average gradients for all well pairs were 0.0083 and 0.0059 foot per foot (ft/ft). This is 8.3 and 5.9 times greater than the required gradient of 0.001 ft/ft, respectively. The monthly average gradient for the northern well pair was 2.2 times the target gradient of 0.001 ft/ft for both months. For the central well pair, the monthly average gradients were 17.3 to 11.8 times the target gradient, respectively. The southern well pair average gradients were 5.4 and 3.7 times the target gradient, respectively. Graphs of the hydraulic gradients, monthly average pumping rates, and river levels for the Fourth Quarter 2016 are discussed in the annual performance evaluation in Section 5.2.

Deep-zone water levels shown on Figure 4-3c indicate that potentiometric levels in monitoring wells in Arizona are higher than those in wells across the river on the California floodplain. This means that the apparent hydraulic gradient on the Arizona side of the river is westward and, as a result, groundwater flow would also be toward the west in that area. This is consistent with the site conceptual model and with the current numerical groundwater flow model.

Daily average groundwater and river elevations, calculated from the pressure transducer data for the Fourth Quarter 2016 reporting period, are summarized in Table E-1 in Appendix E. Groundwater elevations (or total hydraulic heads) are adjusted for temperature and salinity differences between wells (i.e., adjusted to a common freshwater equivalent). Groundwater elevation hydrographs for the PMP wells during the 2016 reporting period are included in Appendix E. The elevation of the Colorado River measured at the I-3-gauge station (location shown on Figure 4-3a) is also shown on the hydrographs in Appendix E.

Average Fourth Quarter 2016 groundwater elevations for the shallow, mid-depth, and deep wells are presented and contoured in plan view on Figures 4-3a through 4-3c. Average groundwater elevations for wells on floodplain cross-section A are presented and contoured on Figure 4-4. Several monitoring wells are significantly deeper than other wells in the lower depth interval. Due to complex vertical gradients present at portions of the Topock site, water levels for some wells are not considered in the contouring in the plan views on Figures 4-3a, 4-3b, 4-3c, and on the cross-section of Figure 4-4.

For the Fourth Quarter 2016 reporting period, transducer data were also recorded in wells located on the Arizona side of the Colorado River. The quarterly average groundwater elevations for wells MW-55-120, MW-54-085, MW-54-140, and MW-54-195 are presented on Figure 4-3c, if available, and are used for contouring where appropriate. With the exception of well MW-55-045, all wells in the MW-54 and MW-55 clusters are screened in the deep interval of the Alluvial Aquifer. Well MW-55-045 is screened across portions of the shallow and middle intervals.

4.6 Projected River Levels during Next Quarter

The Colorado River stage near the Topock Compressor Station is measured at the I-3 location and is directly influenced by releases from Davis Dam and, to a lesser degree, from Lake Havasu elevations, both of which are controlled by the United States Bureau of Reclamation (USBR). Total releases from Davis Dam follow a predictable annual cycle, with largest monthly releases typically in spring and early summer, and smallest monthly releases in late fall/winter (November and December). Superimposed on this annual cycle is a diurnal cycle determined primarily by daily fluctuations in electric power demand. Releases within a given 24-hour period often fluctuate over a wider range of flows than that of monthly average flows over an entire year. Figure 4-5 shows the river stage measured at I-3 superimposed on the projected I-3 river levels.

Projected river levels for future months are based on the USBR projections of Davis Dam discharge and Lake Havasu levels from the preceding month. For example, the projected river level for January 2017 is based on the December 2016 USBR projections of Davis Dam release and Lake Havasu level, not the actual release and level values. The variability between measured and projected river levels is due to the difference between measured and actual Davis Dam release and Lake Havasu levels. The more recent data (last 4 years; plotted on Figure 4-5) are summarized in Table 4-3. The future projections shown on Figure 4-5 (predicted data points and lines are in different color than actual measurements) are based on USBR long-range projections of Davis Dam releases and Lake Havasu levels from December 2016. There is more uncertainty in these projections at longer times in the future because water demand is based on various elements including climatic factors.

Current USBR projections, presented in Table 4-3, show that the average Davis Dam release for January 2017 (8,000 cubic feet per second) will be more than the actual release in December 2016 (7,800 cubic feet per second). Based on January 2017 USBR projections, it is anticipated that the Colorado River level at the I-3 gage location in January 2017 will be approximately 0.35 ft lower compared to the actual levels in December 2016. Current projections show that the water levels will increase through the next quarterly reporting period (January through March), further increasing to the maximum levels of the year projected for April, as shown on Figure 4-5.

4.7 Quarterly Performance Monitoring Program Evaluation Summary

The groundwater elevation and hydraulic gradient data from November and December 2016 performance monitoring indicate that the minimum landward gradient target of 0.001 ft/ft was exceeded each month during the Fourth Quarter 2016. The overall average landward gradients during Fourth Quarter 2016 for

November and December were 8.3 and 5.9 times the required minimum magnitude, respectively, as shown in Table 4-2. The gradient analysis from designated well pairs are an approved line of evidence for assessing hydraulic containment of the Cr(VI) plume created by pumping from extraction wells TW-03D and PE-01. Based on the hydraulic and monitoring data and evaluation presented in this report, the IM performance standard has been met for the Fourth Quarter 2016 reporting period.

A total of 11,848,020 gallons of groundwater was extracted during Fourth Quarter 2016 by the IM-3 treatment facility. The average pumping rate for the IM extraction system during Fourth Quarter 2016, including system downtime, was 134.9 gpm. An estimated 78.8 pounds (35.8 kilograms) of chromium were removed from groundwater during Fourth Quarter 2016, as presented in Table 4-1.

The wells monitored to detect trends in Cr(VI) in the IM pumping area (for example, MW-36-100, MW-39-100, MW-44-115, MW-44-125, and MW-46-175) generally continue to show overall stable or declining Cr(VI) concentrations relative to prior monitoring results, as shown in Appendix C. Presentation and evaluation of the Cr(VI) trends observed in the performance monitoring area during the Fourth Quarter 2016 reporting period are discussed in Section 5.3.

5 ANNUAL PERFORMANCE MONITORING PROGRAM EVALUATION

The section presents the annual PMP evaluation summary.

5.1 Extraction System Operations for Annual Reporting Period

5.1.1 Extraction Facilities and Operations

Extraction wells TW-03D and PE-01 operated throughout the Annual Reporting Period consistent with the target pumping rate of 135 gpm, excluding periods of planned and unplanned downtime (Table 5-1). During the Annual Reporting Period, extraction wells TW-02D and TW-02S were operated only for operations and maintenance, or for periodic groundwater sampling.

An estimated total of 67,910,564 gallons of groundwater were extracted from January 2016 through December 2016. Approximately 328 pounds (149 kilograms) of chromium were removed from the aquifer and treated at the IM-3 treatment plant over the 2016 Annual Reporting Period (Table 4-1). The total mass of chromium removed by the IM-2 and IM-3 extraction systems during IM pumping from March 2004 through December 31, 2016 is approximately 8,800 pounds (3,990 kilograms). The average annual pumping rate during the 2016 reporting period was 128.5 gpm, with pumping mainly from extraction wells TW-03D and PE-01.

Figure 5-1 summarizes the monthly pumping rates, cumulative volumes extracted, and the percentage of time during which the extraction system was in operation during the 2016 Annual Reporting Period. This figure shows that pumping rates were relatively consistent from month to month, with IM-3 running at close to design capacity. The consistent high pumping rates are corroborated by the high percentage of uptime for the IM extraction and treatment facilities throughout the year. The decrease in uptime during April 2016 was due to the planned annual treatment plant maintenance event. The decrease in August 2016 was due to the planned semiannual treatment plant maintenance event.

5.1.2 Extracted Groundwater Quality and Trends

Extraction well TW-03D was brought online in late December 2005, and groundwater extraction at well PE-01 on the floodplain began on January 25, 2006. While TW-03D operated continuously in 2016, PE-01 was shut down in February 2016 and remained off (except for 1 week in June) through Second Quarter. It was then operated intermittently during Third and Fourth Quarters 2016 as river levels fell.

During the 2016 Annual Reporting Period, Cr(VI) concentrations in TW-03D decreased slightly during the early months of the year (January through May), remained stable June through October, then increased slightly in November and December. During the Annual Reporting Period, concentrations ranged from a maximum value of 790 µg/L in March 2016 to a minimum value of 530 µg/L in August 2016 (Table 5-2 and Figure 5-2). TDS concentrations were stable (Figure 5-2).

During the 2016 reporting period, Cr(VI) concentrations in the extracted groundwater at PE-01, located on the floodplain, decreased during the early months of the year (January through May), then were stable for most of the rest of the year. The Cr(VI) concentrations ranged from a maximum of 3.9 µg/L in February 2016 to a minimum of 0.79 µg/L in March (Figure 5-2). TDS concentrations were stable.

5.2 Capture Zone Analysis for Annual Reporting Period

5.2.1 Monthly Average Gradients

For each month of the Annual Reporting Period, the overall average hydraulic gradient (combining the three well pairs) exceeded the IM target landward gradient of 0.001 ft/ft (Table 5-3). In addition, this target was met each month for each of the three well pairs during the reporting period. This was the case even during the lower river stages observed in January and December 2016 (Figure 5-3). During the Annual Reporting Period, the average daily river levels at river stations I-3 and RRB (Figure 1-3) ranged from 455.19 to 455.54 feet above mean sea level (Table E-2).

While exceeding the performance standard each month for which the gradient was calculated, the northern well pair (MW-31-135/MW-33-150) generally exhibited the lowest measured gradients because the line connecting the two wells is not oriented in the same direction as the hydraulic gradient generated by pumping. Thus, the hydraulic gradient measurements for the northern well pair underestimate the true value.

5.2.2 Annual Average Gradients

The net annual landward gradients illustrated on the aquifer interval maps (Figures 5-4a through 5-4c, and Figure 5-5, with values listed on Table E-2) show that the gradients are landward and are comparable to the gradient maps prepared using previous monitoring data (CH2M Hill 2012b-e, 2013a-d, 2014b-e).

5.2.3 Analysis and Evaluation of Capture Zone

The methodology and results of the capture zone evaluations for 2016are summarized in the following subsections.

5.2.3.1 Well Group Gradient Averaging

The temporal variation in magnitude and direction of horizontal hydraulic gradients in the lower-depth aquifer interval was assessed using quarterly average water levels and triangulation with linear interpretation for two well groupings (MW-31-135/MW-33-150/MW-34-100 and MW-45-095/MW-34-100/MW-27-085) in the IM performance area. Figure 5-6 shows the two well groupings and the calculated average gradients for all four quarterly monitoring periods in 2016.

This analysis shows that landward gradients were achieved during the Annual Reporting Period, and that the magnitude and direction of the landward gradients were similar during each quarter. These gradients are not necessarily exactly the same as those calculated between the hydraulic gradient control well pairs (Table 5-3) because they are planar defined by each three-well group (i.e., a three-point solution) as opposed to relying on only two wells. Stronger landward gradients were calculated using the three-well method than those measured for the northern well pair MW-31-135/MW-33-150 (Table 5-3) due to a more optimally aligned gradient direction; the northern gradient pair is not aligned parallel to the direction of the hydraulic gradient in this area during IM-3 pumping.

5.2.3.2 Particle Track Analysis

Particle tracking was conducted in 2006 to calculate the direction and distance that groundwater would likely flow using selected starting points in the floodplain under the dual-well (TW-3D and PE-1) IM pumping system. At the time, TW-3D and PE-1 were pumping a combined annual average rate of 131.8 gpm. The 2006 annual IM performance evaluation report (CH2M Hill 2007) contains the particle tracking figure and the methods, input parameters, and data used for this analysis.

A particle tracking analysis using 2016 data was not performed because the pumping locations have not changed, the combined pumping rates for 2016 are estimated to be essentially the same (128.5 gpm) as 2006, the river elevations were similar, and the gradients for the lower interval were comparable for the 2006 and 2016 annual periods.

5.3 Evaluation of Groundwater Quality Trend

5.3.1 Cr(VI) Distribution and Trends

Figure 4-1 presents the Fourth Quarter 2016 Cr(VI) concentration results in floodplain wells in the upper, mid-depth, and lower intervals of the Alluvial Aquifer. The Cr(VI) contours presented on this figure incorporate data from the most comprehensive sampling event of the year.

Figure 5-7 presents graphs of Cr(VI) concentration versus time for selected deep monitoring wells in the floodplain area through December 2016. Cr(VI) results are plotted for wells MW-34-100, MW-36-090, MW-36-100, MW-44-115, MW-44-125, and MW-46-175. Analytical results for September 2015 through the 2016 Annual Reporting Period are presented in Table 3-1. The locations of the deep wells selected for performance evaluation are shown on Figure 4-1. Also, Appendix C includes Cr(VI), molybdenum, nitrate, and selenium concentration graphs for selected monitoring well clusters through December 2016.

Wells showing marked decreases in concentration are generally in the floodplain area where IM pumping is removing chromium in groundwater. Wells with historical detections near or at reporting limits remained at these levels during the Fourth Quarter 2016 period. Cr(VI) concentrations have remained steady or have decreased in many wells since IM and PE-01 pumping began in 2004 and 2005, respectively (Figure 5-7 and Appendix C).

Key Cr(VI) concentration trends over the long term for the PMP wells sampled during the 2016 reporting period include:

- Concentrations at the MW-20 cluster (located near the TW-03D pumping well) indicate generally decreasing concentrations at the shallow well MW-20-070 (since 2011), at MW-20-100 (since May 2007), and at MW-20-130 (since 2007; Figure C-3).
- As shown on Figure 5-7 and Figure C-6, well MW-34-100 has shown a seasonally fluctuating trend in Cr(VI) concentration. Concentrations at this well showed a general decreasing trend between 2006 and 2011, with a seasonally variable but stable/consistent concentration profile since 2011 Landward gradients have been present at this location since IM pumping began; therefore, the seasonal fluctuations in concentration observed at MW-34-100 are not considered an indication of any migration of the plume toward the river.
- Deep well MW-36-100 Cr(VI) concentrations initially increased upon the startup of PE-01 pumping, began to decrease in 2007, and have remained lower than 100 µg/L since late 2008, as shown on

Figures 5-7 and C-7. Between April and December 2016, Cr(VI) concentrations in MW-36-100 decreased to less than 32 µg/L (Table 3-1).

- Deep well MW-39-100 concentrations steadily declined since the start of IM pumping (Figure C-8) and are currently less than 100 µg/L (Table 3-1).
- Deep well MW-44-115 has shown a downward trend since July 2006, as presented on Figures 5-7 and C-10. Well MW-44-125 has also shown an overall downward trend since November 2008, as presented on Figures 5-7 and C-10. Current Cr(VI) concentrations in these wells are less than 32 µg/L.
- Concentrations in deep well MW-46-175 have shown a seasonally fluctuating but overall downward trend since 2007, as presented on Figures 5-7 and C-11. Current Cr(VI) concentrations in this well are less than 32 µg/L.
- Well TW-04, a deeper well, has shown a declining trend since March 2007, as presented on Figure C-19, and detected Cr(VI) concentrations have been less than 32 µg/L since 2007.

5.3.2 Groundwater Geochemistry in Interim Measures Extraction Area

5.3.2.1 Oxidation-reduction Potential Evaluation

Arsenic and manganese samples were collected to establish baseline conditions of in situ byproducts that may be produced upon implementation of the groundwater remedy. The distribution of these redox indicator parameters is generally consistent with that from previous years (Figures 5-8 and 5-9). Reducing conditions are prevalent in wells completed near the Colorado River (where there is a higher level of organic material in the fluvial sediments) than in wells located further to the west from the Colorado River completed in alluvial sediments with a lower organic carbon content.

5.3.2.2 General Chemistry Evaluation

Fifteen floodplain wells were sampled for chemical performance monitoring parameters from March 2005 through December 2016 (Tables F-1 and D-4). Shallow-depth wells exhibit both increases and decreases in some of these same parameters during this period. The majority of the field parameters in groundwater samples from these wells remained relatively stable during the 2016 reporting period (Table 3-1).

5.3.2.3 Stable Isotope Evaluation

Analysis of the $\delta^{18}O$ and $\delta^{2}H$ provide a method of tracking the mixing occurring in floodplain groundwater as a result of IM extraction. The lighter signatures (left side of Figure 5-10) are generally found in the river (R-28) and fluvial non-plume well samples, whereas the heaviest signatures are found in selected alluvial plume wells (for example MW-20-130 on the right side of the plot), which likely contain higher percentages of water that has flowed from the upland areas or has been affected by evaporation in the cooling towers (Figure 5-10).

The effects of IM pumping on the isotopic signature of floodplain wells have been presented in previous reports (CH2M Hill 2015c). The percent river water signature was calculated by using composite statistics for (δ2H) isotope data from site river water samples (light fraction) and groundwater samples with greater than 3,000 µg/L Cr(VI) (heavy fraction; termed “industrial water”). This report suggests that the isotopic signature in most industrial signature wells has progressed towards a river water signature since IM pumping began. This is likely a result of the continuous landward gradient created by IM pumping and the resultant mixing of industrial water with river-influenced groundwater. These changes are most likely due to lateral and downward movement of shallow floodplain water, which has an isotopic signature similar to that of river water.

This progression toward a river water signature for industrial-signature wells was also observed between 2015 and 2016, particularly in wells exhibiting the heaviest isotopic signature (Figure 5-10). Monitoring wells MW-20-130, MW-20-100, MW-31-060, and MW-34-100 each had lighter isotopic signatures in 2016 as compared to 2015. Although an opposite trend was observed for MW-25, and MW-26, and MW-20-070, the overall magnitude of the change between 2015 and 2016 was smaller for these wells. MW-36-100 exhibited a very small overall change, but already shows a lighter isotopic signature similar to river water.

5.4 Summary, Conclusions, and Status of Interim Measures Operations

5.4.1 Performance Evaluation

As of March 2016, the IM has operated full-time for 12 years and has been successful in meeting the IM objectives and performance criteria. This section summarizes the conclusions of IM operations and performance monitoring for the 2016 Annual Reporting Period.

5.4.1.1 Attainment of Performance Standard

Throughout 2016, the IM extraction system (combined wells TW-03D and PE-01) operated at the target pumping rate of 135 gpm, excluding periods of planned and unplanned downtime. The operational run-time percentage for the extraction system was 95.4 percent during the 2016 Annual Reporting Period.

The average pumping rate for the IM extraction system, including downtime, during the annual period was 128.5 gpm.

The following are results and conclusions of the 2016 performance evaluation.

- A total of 67,910,564 gallons of groundwater was extracted and treated at the IM-3 system during the 2016 Annual Reporting Period. The IM system removed approximately 328 pounds (149 kilograms) of chromium from the aquifer during the 2016 Annual Reporting Period.
- The IM pumping rate was sufficient to exceed the minimum overall average landward gradient metric throughout the 2016 Annual Reporting Period. The strong landward gradients were maintained, even during the period of lower river stages in January and December 2016.
- The hydraulic gradients measured in the approved well pairs exceed the metric used as a line of evidence for hydraulic plume control as a result of pumping from extraction wells TW-03D and PE-01.

5.4.1.2 Cr(VI) Distribution and Trends

The following are key conclusions on Cr(VI) distribution and trends observed in the IM performance monitoring area during 2016.

- Overall, the groundwater Cr(VI) concentrations in the floodplain are stable or decreasing. The ongoing monitoring has shown marked decreases in Cr(VI) concentration in the floodplain areas where IM pumping exerts a strong influence on hydraulic gradients (for example, well clusters MW-36, MW-39, and MW-44).
- MW-34-100 has shown a seasonally fluctuating trend in Cr(VI) concentration over the past 9 years but with a general downward trend. Also, landward gradients have been present at this location since IM pumping began.
- The groundwater ORP and stable isotope data continue to confirm that continued IM extraction is drawing more oxidizing river-influenced groundwater into the performance monitoring area.

5.4.2 Status of Operations and Maintenance

Per DTSC acknowledgment in a letter dated July 20, 2015 (DTSC 2015), PG&E will continue to operate TW-03D at a target pumping rate of 135 gpm, except for periods of planned and unplanned downtime, to maintain appropriate hydraulic gradients across the Alluvial Aquifer. If needed, PE-01, TW-02D, or TW-02S will be pumped to supplement and achieve the total flow, and PE-01 will also be operated when needed to maintain hydraulic gradients.

Current USBR projections show that river levels will increase during the next quarterly reporting period (January through March 2017) on through April, and then will decline from April into the winter (Figure 4-5). By April 2017, the average monthly river elevations are projected to reach their maximum level of the year. The lowest river levels during the upcoming IM operations year are expected to occur in December 2017.

6 UPCOMING OPERATION AND MONITORING EVENTS

Reporting of the IM extraction and monitoring activities will continue as described in the PMP and under direction from DTSC. Monitoring results, operations, and performance monitoring data will be reported in the First Quarter 2017 Quarterly Monitoring Report, which will be submitted by April 30, 2017.

6.1 Groundwater Monitoring Program

6.1.1 Quarterly Monitoring

Consistent with the July 23, 2010 DTSC sampling schedule approval (DTSC 2010a), the First Quarter 2017 monitoring event occurred February 6 through February 10, 2017. This sampling event was conducted at 22 wells. Results will be reported in the First Quarter 2017 Quarterly Monitoring Report.

6.1.2 Monthly Monitoring

Monthly sampling of TW-03D will continue during the first 2 weeks of each month. Results will be reported in the First Quarter 2017 Quarterly Monitoring Report.

6.2 Surface Water Monitoring Program

The First Quarter 2017 surface water monitoring event was conducted February 21 and 22, 2017 at 25 locations in the RMP monitoring network. In addition, the First Quarter 2017 includes an additional “low river” surface water monitoring event, conducted on January 24 and 25, 2017. Results for both events will be reported in the First Quarter 2017 Quarterly Monitoring Report.

6.3 Performance Monitoring Program

6.3.1 Extraction

The IM3 extraction system will continue to be operated in compliance with the DTSC letter dated July 20, 2015 (DTSC 2015) giving conditional approval for PE-01 pumping modifications. PG&E will continue to operate both TW-03D and PE-01 with a target combined pumping rate of 135 gpm, except for periods of planned or unplanned downtime, to maintain appropriate hydraulic gradients across the Alluvial Aquifer. Extraction will be primarily from TW-03D coupled with PE-01 (primarily used to maintain gradient control during low river stages). If TW-03D and PE-01 cannot produce the target pumping rate of 135 gpm, then TW-02D and/or TW-02S may be pumped to supplement and achieve total flow.

In 2016, PE-01 was shut off in February and remained off through Second Quarter, then resumed pumping as river levels dropped during Third Quarter. When PE-01 is shut off, pumping is supplemented by TW-02D to maintain total flow. in 2017, Hydraulic gradients will continue to be monitored at key well pairs to ensure that 0.001 ft/ft landward gradients are met. As requested at the July 2015 Consultative Work Group (CWG) meeting, monthly IM-3 hydraulic performance data continue to be shared with agencies, Tribes, and stakeholders. The February 2017 data snapshot will be submitted to DTSC and DOI by March 21, 2017. The next monthly data will be submitted by April 21, 2017. In addition, quarterly GMP monitoring results from wells listed within the July 20, 2015 DTSC approval letter will be compared to the maximum Cr(VI) and chromium concentrations measured in 2014 (or for biennial sampling frequency, the 2013 maximum concentrations), and results that exceed the previous maximum will be reported to DTSC within 40 days after the end of the quarterly GMP sampling event.

6.3.2 Transducer Download

Downloads of the transducers in the key gradient control wells (MW-27-085, MW-31-135, MW-33-150, MW-34-100, and MW-45-095) and the MW-33 cluster will continue via telemetry at monthly or more frequent intervals, as needed to support IM-3 pumping operations, during First Quarter 2017. Downloads of the remainder of the transducers will occur monthly (within the first 2 weeks of each month) during First Quarter 2017.

7 RECOMMENDATIONS

This section presents the recommended modifications to the sampling program(s).

7.1 Performance Monitoring Program

Chromium sample results for all wells have generally remained lower than their respective trigger levels since they were established in August 2006 and approved in July 2008 (CH2M Hill 2006; DTSC 2008b). Most wells yielding concentrations higher than the IM performance standard of 20 μg/L for Cr(VI) show stable or decreasing trends (see Appendix C); therefore, no changes in trigger levels (or any other changes) to the PMP program are recommended at this time.

7.2 Groundwater Monitoring Program

7.2.1 Recommendations from the Current Sampling Methods Evaluation

This section provides recommendations based on results of a method trials analysis at select wells following 2 full years of sample collection. Recommendations provided herein are in addition to (and do not take the place of) existing recommendations under agency review discussed in Section 7.2.3.

7.2.1.1 Recommendations from Sampling Method Trials

Results from 2 years of sampling method trials at select wells were evaluated in Section 2.1.3.2 of this report. Results show consistency between the low-flow sampling method and historical three-volume purge sampling at both MW-38S and MW-38D. Therefore, it is recommended that the trial end at these two wells and both be sampled by low-flow methods moving forward. This recommendation was also made in last year’s annual report (Arcadis 2016a), currently under agency review. Sampling method trials for HYDRASleeve™ sampling were also continued in 2016 at wells MW-40S and MW-40D. At MW-40S, planned annual samples for Fourth Quarter 2016 were not collected due to pending access approval in the highway right-of-way. These samples are planned to be collected (pending approval) during First Quarter 2017. At this location, only two rounds of comparison samples have been collected to date, and while results have been consistent so far, it is recommended that low-flow and HYDRASleeve™ sample frequency be increased to the same (semiannual) frequency as MW-40D in 2017. This would double the sample collection frequency and help to recommend a single future sample collection method. At MW-40D, four rounds of HYDRASleeve™ sampling results have been collected to date (with no sample collected during Fourth Quarter 2016 due to access approval in the highway right-of-way). Results from four rounds of sampling suggest that HYDRASleeve™ sampling may be a viable alternative to low-flow sampling at this location, but additional sampling is needed to complete the evaluation. It is recommended that the sampling trial at this location continue semi-annually through 2017 to help recommend a single future sample collection method. An updated evaluation of the HYDRASleeve™ sampling method trials at MW-40S and MW-40D will be presented in the 2017 Annual Report.

Recommendations provided herein are in addition to (and do not take the place of) existing recommendations under agency review discussed in Section 7.2.2.

7.2.2 Groundwater Monitoring Program Requests under Agency Review

With approval of the sampling frequency modification on June 27, 2014, the DTSC also requested a revised sampling plan for non-chromium metals and water quality analyses. The approved purge methods and sampling frequencies for several DTSC-approved sampling programs, as well as proposed sampling plans for other non-chromium analyses, were included in the 2014 Annual Report (CH2M Hill 2015a). These recommendations, presented in the 2014 Annual Report, are awaiting regulatory agency review and comment.

In August 2015, PG&E sent a letter to DTSC (PG&E 2015) recommending additional wells for low-flow sampling as well as proposing an additional sampling method trial for select bedrock wells. Recommendations made in the letter still stand and are awaiting agency decision.

8 REFERENCES

Arcadis. 2016a. Fourth Quarter 2015 and Annual Interim Measures Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California. March 15.

Arcadis. 2016b. First Quarter 2016 Interim Measures Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California. April 30.

Arcadis. 2016c. Letter from Dan Cichy/Arcadis to Aaron Yue/DTSC. "Notification per IM3 Modification Conditional Approval – Q2 2016." June 15.

Arcadis. 2016d. Second Quarter 2016 Interim Measures Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California. August 15.

Arcadis. 2016e. Third Quarter 2016 Interim Measures Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California. December 15.

Arcadis. 2017. Letter from Dan Cichy/Arcadis to Aaron Yue/DTSC. "Notification per IM3 Modification Conditional Approval – Q4 2016." January 23.

Arizona Department of Environmental Quality (ADEQ). 2010. Email. "Re: Reminder – sampling frequency modification for Arizona wells proposed with 4Q2009 data submittal." April 23.

ADEQ. 2015. Letter from Nicole Osuch/ADEQ to Yvonne Meeks/PG&E. "Response to Review of Arizona Monitoring Wells November – December 2014 Groundwater Sampling results." June 29.

ADEQ. 2016. Letter from Nicole Osuch/ADEQ to Yvonne Meeks/PG&E. "Review of AZ Monitoring Wells Sampling Results for Topock VRP Site." May 18.

California Department of Toxic Substances Control (DTSC). 2005a. Letter to PG&E. "Requirements for Groundwater and Surface Water Monitoring Program, Pacific Gas and Electric Company, Topock Compressor Station, Needles, California (EPA ID No. CAT080011729)." April 26.

DTSC. 2005b. Letter to PG&E. “Criteria for Evaluating Interim Measures Performance Requirements to Hydraulically Contain Chromium Plume in Floodplain Area, Pacific Gas and Electric Company, Topock Compressor Station, Needles, California (EPA ID No. CAT080011729).” February 14.

DTSC. 2005c. Letter. “Contingency Plan for Sentry Well Groundwater Monitoring.” February 14.

DTSC. 2007a. Letter. “Approval of Updates and Modifications to the Interim Measures Performance Monitoring Program. Pacific Gas and Electric Company, Topock Compressor Station.” October 12.

DTSC. 2007b. Letter. “Updates and Modifications to the PG&E’s Topock Interim Measures Performance Monitoring Program. PG&E Topock Compressor Station, Needles, California.” July 27.

DTSC. 2007c. Letter. “Conditional Approval of Updates and Modifications to the Groundwater and Surface Water Monitoring Program, Pacific Gas and Electric Company, Topock Compressor Station.” September 28.

DTSC. 2008a. Letter. “Modifications to Hydraulic Data Collection for the Interim Measures Performance Monitoring Program at Pacific Gas and Electric Company (PG&E), Topock Compressor Station, Needles, California.” July 14.

DTSC. 2008b. Letter. “Modifications to Chemical Performance Monitoring and Contingency Plan for the Floodplain Interim Measures Performance Monitoring Program at Pacific Gas and Electric Company (PG&E), Topock Compressor Station, Needles, California.” July 17.

DTSC. 2009a. Email. “Re: Request for Combined Reporting of Topock GMP and PMP.” May 26.

DTSC. 2009b. Letter. “Comments on January 27, 2009 Draft Corrective Measures Study/Feasibility Study (CMS/FS) Report for SWMU1/AOC1, (EPA ID NO. CAT080011729).” March 26.

DTSC. 2010a. Email. “Re: Topock GMP sampling event timing and reporting schedule.” July 23.

DTSC. 2010b. Letter. “Arizona Monitoring Well Sampling Frequency Modification. Pacific Gas and Electric Company (PG&E), Topock Compressor Station, Needles, California.” April 28.

DTSC. 2010c. Email. “Re: Topock GMP Monitoring Frequency Modification.” March 3.

DTSC. 2011. Email. “Re: Topock GMP COPC sampling plan: topic for weekly tech calls.” November 18.

DTSC. 2013. Letter. “Repairing Wells in Accordance with California Well Standards at Pacific Gas and Electric Company (PG&E), Topock Compressor Station, Needles, California (EPA ID NO. CAT080011729).” January 28.

DTSC. 2014a. Directives on Outstanding Issues of the Response to Basis of Design Report/Intermediate (60%) Design Comments for PG&E Topock Compressor Station Remediation Site. April 4.

DTSC. 2014b. Email from Chris Guerre/DTSC to Yvonne Meeks/PG&E. “PG&E Topock: DTSC response to Section 7 2013 Annual Report Recommendations.” June 27.

DTSC. 2015. Letter from Aaron Yue/DTSC to Yvonne Meeks/PG&E “Conditional Approval of Proposal to Modify Interim Measures 3 (IM3) Extraction Well Pumping at Pacific Gas and Electric Company, Topock Compressor Station (PG&E), Needles, California (USEPA ID No. CAT080011729).” July 20.

DTSC. 2017. PG&E Topock Compressor Station: Environmental Investigation and Cleanup Activities. <web page> Located at: http://dtsc-topock.com/.

California Regional Water Quality Control Board. 2006. Letter to PG&E. “Request to Treat Groundwater Generated through Groundwater Monitoring and Other Field Activities through the Interim Measures No. 3 Groundwater Remediation System Facility, PG&E Topock Compressor Station, Needles, California. January 26.

California Regional Water Quality Control Board. 2011. Letter to DOI. “Enforcement of Applicable or Relevant and Appropriate Requirements for the Interim Measure 3 Facility – PG&E Topock Compressor Station Site.” July 26.

CH2M Hill. 2005a. Performance Monitoring Plan for Interim Measures in the Floodplain Area, Pacific Gas and Electric Company, Topock Compressor Station, Needles, California. April 15.

CH2M Hill. 2005b. Sampling and Analysis Field Procedures Topock Program Manual, Revision 1, Pacific Gas and Electric Company, Topock Project. March 31.

CH2M Hill. 2006. Contingency Plan for IM Performance Monitoring, Revision 1, dated August 2006. August 28.

CH2M Hill. 2007. Performance Monitoring Report for Fourth Quarter 2006 and Annual Performance Evaluation, February 2006 through January 2007, PG&E Topock Compressor Station, Needles, California. April 6.

CH2M Hill. 2008. Groundwater Background Study, Steps 3 and 4: Final Report of Results, PG&E Topock Compressor Station, Needles, California. July 23.

CH2M Hill. 2009a. Revised Final RCRA Facility Investigation/Remedial Investigation Report, Volume 2—Hydrogeologic Characterization and Results of Groundwater and Surface Water Investigation, Pacific Gas and Electric Company, Topock Compressor Station, Needles, California. February 11.

CH2M Hill. 2009b. Final RCRA Facility Investigation/Remedial Investigation Report, Volume 2 Addendum— Hydrogeologic Characterization and Results of Groundwater and Surface Water Investigation, Pacific Gas and Electric Company, Topock Compressor Station, Needles, California. June 29.

CH2M Hill. 2009c. Final Groundwater Corrective Measures Study/Feasibility Study Report for SWMU 1/AOC 1 and AOC 10, Appendix A, PG&E Topock Compressor Station, Needles, California. December 16.

CH2M Hill. 2011. Final Revised Implementation Plan for Repair of Monitoring Wells MW-38S and MW-38D and Old Well/Pipe Reconnaissance. February 11.

CH2M Hill. 2012a. PG&E Program Quality Assurance Project Plan, Revision 2. August.

CH2M Hill. 2012b. Fourth Quarter 2011 and Annual Interim Measures Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California. March 15.

CH2M Hill. 2012c. First Quarter 2012 Interim Measures Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California. April 30.

CH2M Hill. 2012d. Second Quarter 2012 Interim Measures Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California. August 15.

CH2M Hill. 2012e. Third Quarter 2012 Interim Measures Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California. November 30.

CH2M Hill. 2012f. Topock – Proposed Technical Trial for Alternative Sampling Approaches at Selected Monitoring Wells (Technical Memorandum). August 27.

CH2M Hill. 2013a. Fourth Quarter 2012 and Annual Interim Measures Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California. March 15.

CH2M Hill. 2013b. First Quarter 2013 Interim Measures Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California. May 15.

CH2M Hill. 2013c. Second Quarter 2013 Interim Measures Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California. August 15.

CH2M Hill. 2013d.Third Quarter 2013 Interim Measures Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California. November 29.

CH2M Hill. 2013e. Basis of Design Report/Intermediate (60%) Design Submittal for the Final Groundwater Remedy, PG&E Topock Compressor Station, Needles, California. April 5.

CH2M Hill. 2014a. Basis of Design Report/Pre-Final (90%) Design Submittal for the Final Groundwater Remedy. September 8.

CH2M Hill. 2014b. Fourth Quarter 2013 and Annual Interim Measures Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California. March 14.

CH2M Hill. 2014c. First Quarter 2014 Interim Measures Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California. April 30.

CH2M Hill. 2014d. Second Quarter 2014 Interim Measures Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California. August 15.

CH2M Hill. 2014e. Third Quarter 2014 Interim Measures Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California. December 15.

CH2M Hill. 2015a. Fourth Quarter 2014 Interim Measures Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California. March 13.

CH2M Hill. 2015b. First Quarter 2015 Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California. April 30.

CH2M Hill. 2015c. Second Quarter 2015 Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California. August 14.

CH2M Hill. 2015d. Third Quarter 2015 Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California. December 15.

CH2M Hill. 2016a. First Quarter 2016 Monitoring Report, Interim Measures No. 3 Groundwater Treatment System, PG&E Topock Compressor Station, Needles, California. April 15.

CH2M Hill. 2016b. Combined Second Quarter 2016 Monitoring, Semiannual January – June 2016 Operation and Maintenance Report Interim Measure No. 3 Groundwater Treatment System, PG&E Topock Compressor Station, Needles, California. July 15.

CH2M Hill. 2016c. Third Quarter 2016 Monitoring Report, Interim Measures No. 3 Groundwater Treatment System, PG&E Topock Compressor Station, Needles, California. October 14.

Fetter, C.W. 1994. Applied Hydrogeology, Third Edition. Published by Prentice-Hall Inc., New Jersey.

Pacific Gas and Electric Company (PG&E). 2008. Approved Modifications to the Topock IM Performance Monitoring Program PG&E Topock Compressor Station, Needles, California. August 4.

PG&E. 2015. Proposed Trial of Alternative Sampling Approaches at Select Monitoring Wells in the Topock GMP and CMP. August 21.

TABLES

Table 1-1
Topock Monitoring Reporting Schedule
Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

Time Period	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
Groundwater Monitoring Program	January - March	April - June	July - October	November - December
Surface Water Monitoring Program	January - March	April - June	July - October	November - December
Performance Monitoring Program	January - March	April - June	July - October	November - December
IM-3 Monitoring (Chromium removed)	January - February	March - May	June - September	October - December

TABLE 2-1
Results of MW-38 and MW-40 Sampling Method Trials, Fourth Quarter 2016
Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

			MW-38 Low Flow Evaluation									
			MW-38S (quarterly well)					MW-38D (semiannual well)				
		Sampling Event	Date	Cr(VI) Concentration By Method (µg/L)			Evaluation	Date	Cr(VI) Concentration By Method (µg/L)			Evaluation
				3V Purge	Low Flow	HYDRASleeve™			3V Purge	Low Flow	HYDRASleeve™	
Pre-Trial Samples		2Q 2014	5/14/2014	1.5	--	--	3V Only	5/14/2014	17	--	--	3V Only
		3Q 2014	9/22/2014	<0.2	--	--	3V Only	--	--	--	--	well not sampled
Method Trial Event Number	1[C]	4Q 2014	11/5/2014	<0.2	<0.2	--	3V vs LF	11/5/2014	17	18	--	3V vs LF
	2[C]	1Q 2015	2/9/2015	<0.2	0.22	--	3V vs LF	--	--	--	--	well not sampled
	3[C]	2Q 2015	4/30/2015	<0.2	<0.2	--	3V vs LF	4/30/2015	16	20	--	3V vs LF
	4[C]	3Q 2015	9/28/2015	<0.2	<0.2	--	3V vs LF	--	--	--	--	well not sampled
	5[A]	4Q 2015	12/1/2015	<0.2	<0.2	--	3V vs LF	12/1/2015	20	19	--	3V vs LF
	6[A]	1Q 2016	2/24/2016	<0.2	<0.2	--	3V vs LF	--	--	--	--	well not sampled
	7[A]	2Q 2016	5/3/2016	<0.2	<0.2	--	3V vs LF	5/3/2016	18	19	--	3V vs LF
	8[A]	3Q 2016	9/29/2016	0.99	<0.2	--	3V vs LF	--	--	--	--	well not sampled
	9[A]	4Q 2016	12/7/2016	2.7 [2.5]	2.2	--	3V vs LF	12/7/2016	21	20	--	3V vs LF

			MW-40 HYDRASleeve™ Evaluation									
			MW-40S (annual well)					MW-40D (semiannaul well)				
		Sampling Event	Date	Cr(VI) Concentration By Method (µg/L)			Evaluation	Date	Cr(VI) Concentration By Method (µg/L)			Evaluation
				3V Purge	Low Flow	HYDRASleeve™			3V Purge	Low Flow	HYDRASleeve™	
Pre-Trial Samples		1Q 2014	--	--	--	--	well not sampled	--	--	--	--	well not sampled
		2Q 2014	--	--	--	--	well not sampled	4/24/2014	130	--	--	3V Only
		3Q 2014	--	--	--	--	well not sampled	--	--	--	--	well not sampled
Method Trial Event Number	1[C]	4Q 2014	12/4/2014	--	7.6	7.0	LF vs HYDRASleeve™	12/4/2014	--	160	73.0	LF vs HYDRASleeve™
	2[C]	1Q 2015	--	--	--	--	well not sampled	--	--	--	--	well not sampled
	3[C]	2Q 2015	--	--	--	--	well not sampled	5/12/2015	--	120	<1.0	LF vs HYDRASleeve™
	4[C]	3Q 2015	--	--	--	--	well not sampled	--	--	--	--	well not sampled
	5[A]	4Q 2015	12/7/2015	--	8.1	10	LF vs HYDRASleeve™	12/7/2015	--	98	82	LF vs HYDRASleeve TM
	6[A]	1Q 2016	--	--	--	--	well not sampled	--	--	--	--	well not sampled
	7[A]	2Q 2016	--	--	--	--	well not sampled	5/4/2016	--	130	120	LF vs HYDRASleeve TM
	8[A]	3Q 2016	--	--	--	--	well not sampled	--	--	--	--	well not sampled
	9[A]	4Q 2016	see note 1	--	--	--	well not sampled	see note 1	--	--	--	well not sampled

Note:
"--" = Not Collected
[A] Sampling event conducted by ARCADIS.
[C] Sampling event conducted by CH2M Hill
3V = Three (3) volume sampling method
LF = Low flow sampling method
2.7 [2.5] = indicates field duplicate sample results
1. Groundwater sample not collected during 4Q 2016 at MW-40S and MW-40D due to pending access approval.

Table 3-1

Groundwater Sampling Results, September 2015 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,

PG&E Topock Compressor Station, Needles, California

									Selected Field Parameters		
Location ID	Aquifer Zone	Sample Date		Sample Method	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)	Total Chromium (µg/L)	Specific Conductance (µS/cm)	ORP (mV)	Field pH	Turbidity
MW-09	SA	10/7/2015		LF	200	230	---	---	89	7.3	1
MW-09	SA	12/1/2015		LF	190	200	---	2,700	31	7.4	4
MW-09	SA	5/3/2016		LF	190	200 J	---	---	64	7.6	2
MW-09	SA	12/7/2016		LF	160	160	---	3,000	20	7.5	1
MW-10	SA	10/7/2015		LF	190	210	---	---	71	7.4	20
MW-10	SA	12/1/2015		LF	150	170	---	2,400	67	7.4	39
MW-10	SA	5/3/2016		LF	220	220	---	---	42	7.3	5
MW-10	SA	12/7/2016		LF	180	200	---	2,400	18	7.5	11
MW-11	SA	10/7/2015		LF	130	130	---	---	75	7.4	17
MW-11	SA	12/2/2015		LF	120	110	---	2,100	77	7.6	3
MW-11	SA	12/2/2015	FD	LF	120	110	---	2,100	---	---	---
MW-11	SA	5/3/2016		LF	110	110	---	---	90	7.5	2
MW-11	SA	5/3/2016	FD	LF	110	110	---	---	---	---	---
MW-11	SA	12/7/2016		LF	79	84	---	2,300	1.9	7.6	3
MW-11	SA	12/7/2016	FD	LF	80	81	---	2,400	---	---	---
MW-12	SA	12/2/2015		LF	2,300	2,300	---	7,100	98	8.0	1
MW-12	SA	5/2/2016		LF	1,900	2,000	---	---	-11	7.9	3
MW-12	SA	12/7/2016		3V	1,900	2,000	---	7,100	-100	8.2	14
MW-13	SA	12/7/2015		LF	23	22	---	2,100	63	7.3	4
MW-13	SA	12/8/2016		LF	21	21	---	2,300	-89	7.6	1
MW-14	SA	12/7/2015		LF	17	16	---	2,100	31	7.6	106
MW-14	SA	4/27/2016		LF	13	15	---	---	63	7.6	22
MW-14	SA	12/8/2016		LF	14	16	---	2,300	23	7.6	3
MW-15	SA	12/9/2015		LF	13	12	---	1,800	69	7.6	4
MW-15	SA	12/12/2016		LF	12	13	---	1,800	100	7.7	5
MW-16	SA	12/8/2015		LF	11	11	---	1,100	63	7.5	9
MW-17	SA	12/9/2015		LF	13	14	---	1,300	150	7.7	2
MW-18	SA	12/7/2015		LF	22	21	---	1,500	29	7.5	2
MW-18	SA	12/8/2016		LF	20	20	---	1,500	26	7.7	1

Table 3-1

Groundwater Sampling Results, September 2015 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

Location ID	Aquifer Zone	Sample Date		Sample Method	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)	Total Chromium (µg/L)	Specific Conductance (µS/cm)	Selected Field Parameters ORP (mV)	Field pH	Turbidity
MW-19	SA	12/7/2015		LF	450	430	---	2,200	59	7.4	6
MW-19	SA	4/27/2016		LF	450	500	---	---	83	7.3	5
MW-19	SA	12/8/2016		LF	59	57	---	2,000	47	7.5	3
MW-20-070	SA	12/8/2015		LF	1,900	1,900	---	1,900	62	7.7	2
MW-20-070	SA	4/27/2016		LF	2,000	2,300	---	---	100	7.8	5
MW-20-070	SA	12/9/2016		LF	1,800	1,900	---	1,800	41	7.8	2
MW-20-100	MA	12/8/2015		LF	1,600	1,700	---	2,400	53	7.3	8
MW-20-100	MA	4/27/2016		LF	2,200	2,300	---	---	110	7.4	2
MW-20-100	MA	12/9/2016		LF	1,400	1,600	---	2,200	60	7.4	4
MW-20-130	DA	12/8/2015		LF	7,700	8,000	---	12,000	59	7.5	20
MW-20-130	DA	12/8/2015	FD	LF	7,700	8,000	---	12,000	---	---	---
MW-20-130	DA	4/27/2016		LF	9,100	9,400	---	---	69	7.7	4
MW-20-130	DA	12/9/2016		LF	7,600	7,500	---	11,000	60	7.7	6
MW-20-130	DA	12/9/2016	FD	LF	7,800	7,900	---	11,000	---	---	---
MW-21	SA	12/9/2015		LF	1.5	1.4	---	11,000	-18	7.2	2
MW-21	SA	5/3/2016		G	ND (1)	1.8	---	---	-4.1	6.6	9
MW-21	SA	12/14/2016		LF	1.3	1.3	---	16,000	25	7.2	15
MW-22	SA	12/3/2015		LF	ND (1)	ND (1)	---	22,000	-80	6.5	9
MW-22	SA	4/25/2016		LF	ND (1)	ND (1)	---	---	-95	6.7	8
MW-22	SA	12/6/2016		LF	ND (1)	ND (5)	---	21,000	-96	6.7	43
MW-23-060	BR	12/3/2015		3V	36	32	---	16,000	-44	9.8	2
MW-23-060	BR	5/2/2016		3V	37	36	---	---	-57	9.8	2
MW-23-060	BR	12/14/2016		LF	39	34	---	18,000	76	9.7	1
MW-23-080	BR	12/3/2015		3V	1.8	3.2 J	---	17,000	-40	10	1
MW-23-080	BR	5/2/2016		3V	2.7	3.8	---	---	-160	10	2
MW-23-080	BR	12/14/2016		LF	2.2	2.5	---	18,000	24	10	2
MW-23-080	BR	12/14/2016	FD	LF	2	2.3	---	18,000	---	---	---
MW-24A	SA	12/1/2015		LF	ND (0.2)	4	---	1,700	-140	8.6	12
MW-24A	SA	5/3/2016		LF	0.47	ND (1)	---	---	-200	8.3	1

Table 3-1

Groundwater Sampling Results, September 2015 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California

Location ID	Aquifer Zone	Sample Date		Sample Method	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)	Total Chromium (µg/L)	Specific Conductance (µS/cm)	Selected Field Parameters ORP (mV)	Field pH	Turbidity
MW-24A	SA	12/6/2016		LF	ND (0.2)	ND (1)	---	1,600	-180	8.4	2
MW-24B	DA	12/1/2015		LF	32	35	---	18,000	-93	8.1	6
MW-24B	DA	5/3/2016		LF	11	12	---	---	-100	7.7	1
MW-24B	DA	5/3/2016	FD	LF	12	12	---	---	---	---	---
MW-24B	DA	12/6/2016		LF	ND (1)	1	---	19,000	-190	7.8	4
MW-24BR	BR	12/2/2015		3V	ND (1)	ND (1)	---	15,000	-220	7.7	5
MW-24BR	BR	12/7/2016		3V	ND (1)	ND (1)	---	15,000	-220	8.2	3
MW-25	SA	12/7/2015		LF	150	140	---	1,800	86	7.9	14
MW-25	SA	4/27/2016		LF	77	77	---	---	87	7.0	3
MW-25	SA	12/8/2016		LF	120	120	---	1,800	47	7.3	4
MW-26	SA	12/8/2015		LF	2,600	2,700	---	4,200	68	7.3	23
MW-26	SA	12/8/2015	FD	LF	2,600	2,700	---	4,200	---	---	---
MW-26	SA	4/28/2016		LF	2,500	2,700	---	---	96	7.5	5
MW-26	SA	12/8/2016		LF	2,500	2,500	---	3,900	56	7.4	3
MW-26	SA	12/8/2016	FD	LF	2,500	2,100	---	4,000	---	---	---
MW-27-020	SA	12/3/2015		LF	ND (0.2)	ND (1)	---	1,000	-40	7.6	2
MW-27-020	SA	12/6/2016		LF	ND (0.2)	ND (1)	---	1,000	40	7.6	3
MW-27-060	MA	12/3/2015		LF	ND (0.2)	ND (1)	---	940	-130	7.5	19
MW-27-060	MA	12/3/2015	FD	LF	ND (0.2)	ND (1)	---	960	---	---	---
MW-27-060	MA	12/6/2016		LF	ND (0.2)	ND (1)	---	960	-63	7.6	2
MW-27-060	MA	12/6/2016	FD	LF	ND (0.2)	ND (1)	---	950	---	---	---
MW-27-085	DA	12/3/2015		LF	ND (0.2)	ND (1)	---	10,000	-58	7.2	2
MW-27-085	DA	4/25/2016		LF	ND (1)	ND (1)	---	---	-0.50	7.2	4
MW-27-085	DA	4/25/2016	FD	LF	ND (1)	ND (1)	---	---	---	---	---
MW-27-085	DA	12/6/2016		LF	ND (0.2)	ND (1)	---	9,400	32	7.3	5
MW-28-025	SA	12/2/2015		LF	ND (0.2)	ND (1)	---	1,100	76	7.2	1
MW-28-025	SA	4/26/2016		LF	ND (0.2)	ND (1)	---	---	-15	7.2	3
MW-28-025	SA	12/8/2016		LF	ND (0.2)	ND (1)	---	1,200	51	7.3	2
MW-28-090	DA	12/2/2015		LF	ND (0.2)	ND (1)	---	6,700	-44	7.1	1

Table 3-1

Groundwater Sampling Results, September 2015 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California

Location ID	Aquifer Zone	Sample Date		Sample Method	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)	Total Chromium (µg/L)	Specific Conductance (µS/cm)	Selected Field Parameters: ORP (mV)	Field pH	Turbidity
MW-28-090	DA	4/26/2016		LF	ND (0.2)	ND (1)	---	---	-75	7.2	2
MW-28-090	DA	12/8/2016		LF	ND (0.2)	ND (1)	---	4,500	-46	7.2	4
MW-29	SA	12/1/2015		LF	0.24	ND (1)	---	2,200	-120	7.2	1
MW-29	SA	4/26/2016		LF	ND (0.2)	ND (1 J)	---	---	-140	7.2	2
MW-29	SA	12/8/2016		LF	ND (0.2)	ND (1)	---	2,200	-37	7.3	3
MW-30-030	SA	12/3/2015		LF	ND (0.2)	2.3	---	15,000	-110	7.7	18
MW-30-030	SA	12/6/2016		LF	ND (1)	ND (1)	---	17,000	-140	7.6	8
MW-30-050	MA	12/3/2015		LF	ND (0.2)	ND (1)	---	1,000	-56	7.4	2
MW-30-050	MA	12/3/2015	FD	LF	ND (0.2)	ND (1)	---	1,000	---	---	---
MW-30-050	MA	12/6/2016		LF	ND (0.2)	ND (1)	---	1,000	49	7.6	1
MW-31-060	SA	12/7/2015		LF	920	880	---	2,800	-27	7.6	2
MW-31-060	SA	4/27/2016		LF	710	740	---	---	110	7.6	2
MW-31-060	SA	12/9/2016		LF	590	590	---	2,800	-72	7.6	9
MW-31-060	SA	12/9/2016	FD	LF	580	590	---	2,900	---	---	---
MW-31-135	DA	12/7/2015		LF	13	12	---	12,000	-190	7.8	2
MW-31-135	DA	12/9/2016		LF	12	11	---	11,000	-91	7.7	17
MW-32-020	SA	12/3/2015		LF	ND (1)	1.2	---	36,000	-59	6.8	3
MW-32-020	SA	12/3/2015	FD	LF	ND (1)	ND (5)	---	37,000	---	---	---
MW-32-020	SA	12/6/2016		LF	ND (1)	ND (5)	---	36,000	-93	7.0	3
MW-32-035	SA	12/3/2015		LF	ND (1)	ND (1)	---	11,000	-120	7.2	15
MW-32-035	SA	4/25/2016		LF	ND (1)	ND (1)	---	---	-150	6.9	9
MW-32-035	SA	12/6/2016		LF	ND (0.2)	ND (1)	---	10,000	-82	7.0	8
MW-33-040	SA	12/1/2015		LF	ND (1)	ND (1)	---	16,000	71	7.7	5
MW-33-040	SA	4/26/2016		LF	ND (1)	ND (1)	---	---	78	8.0	6
MW-33-040	SA	4/26/2016	FD	LF	ND (0.2)	ND (1)	---	---	---	---	---
MW-33-040	SA	12/8/2016		LF	ND (1)	ND (1)	---	17,000	32	7.7	6.9
MW-33-090	MA	12/1/2015		LF	6.2	5.8	---	9,500	130	7.4	1
MW-33-090	MA	4/26/2016		3V	5.6	5.2	---	---	-17	7.0	5
MW-33-090	MA	12/8/2016		LF	5.2	4.8	---	9,600	22	7.2	3.1

Table 3-1

Groundwater Sampling Results, September 2015 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California

Location ID	Aquifer Zone	Sample Date		Sample Method	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)	Total Chromium (µg/L)	Specific Conductance (µS/cm)	Selected Field Parameters ORP (mV)	Field pH	Turbidity
MW-33-150	DA	12/1/2015		LF	2.9	4.3	---	15,000	110	7.1	2
MW-33-150	DA	4/26/2016		LF	6.1	5.2	---	---	11	7.2	3
MW-33-150	DA	12/8/2016		LF	4.6	5.2	---	15,000	57	7.4	2
MW-33-210	DA	12/1/2015		LF	14	13	---	19,000	81	7.4	6
MW-33-210	DA	4/26/2016		LF	10	10	---	---	52	7.4	3
MW-33-210	DA	12/8/2016		3V	11	12	---	19,000	55	7.4	5
MW-34-055	MA	12/3/2015		LF	ND (0.2)	1.4	---	960	-42	7.6	1
MW-34-055	MA	12/6/2016		LF	ND (0.2)	ND (1)	---	1,000	21	7.7	1
MW-34-080	DA	12/3/2015		LF	ND (0.2)	ND (1)	---	6,000	-36	7.2	1
MW-34-080	DA	4/26/2016		LF	ND (0.2)	ND (1)	---	---	-190	7.2	3
MW-34-080	DA	12/6/2016		LF	ND (0.2)	ND (1)	---	6,800	-4.4	7.2	1
MW-34-080	DA	12/6/2016	FD	LF	ND (0.2)	ND (1)	---	6,800	---	---	---
MW-34-100	DA	10/6/2015		LF	70	67	---	---	10	7.7	1
MW-34-100	DA	12/3/2015		LF	260	260	---	17,000	-91	7.8	2
MW-34-100	DA	12/3/2015	FD	LF	260	250	---	17,000	---	---	---
MW-34-100	DA	2/25/2016		LF	41	31	---	---	-36	7.7	2
MW-34-100	DA	4/26/2016		LF	4.2	4.6	---	---	-29	7.4	4
MW-34-100	DA	10/6/2016		LF	1.3	1.7	---	---	---	---	---
MW-34-100	DA	12/6/2016		LF	18	17	---	16,000	-53	7.6	4
MW-35-060	SA	12/7/2015		LF	22	23	---	7,200	49	7.0	1
MW-35-060	SA	4/27/2016		LF	24	23	---	---	60	7.2	8
MW-35-060	SA	4/27/2016	FD	LF	25	24	---	---	---	---	---
MW-35-060	SA	12/9/2016		LF	20	20	---	7,100	46	7.3	6
MW-35-135	DA	12/7/2015		3V	30	28	---	11,000	57	7.3	2
MW-35-135	DA	4/27/2016		LF	25	27	---	---	22	7.4	7
MW-35-135	DA	12/9/2016		LF	31	28	---	10,000	48	7.7	5
MW-35-135	DA	12/9/2016	FD	LF	30	28	---	10,000	---	---	---
MW-36-020	SA	12/8/2015		LF	ND (0.2)	ND (1)	---	12,000	-140	7.2	2
MW-36-020	SA	12/7/2016		LF	ND (0.2)	ND (1)	---	9,400	-99	7.3	4.2

Table 3-1

Groundwater Sampling Results, September 2015 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

Location ID	Aquifer Zone	Sample Date	Sample Method	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)	Total Chromium (µg/L)	Specific Conductance (µS/cm)	Selected Field Parameters: ORP (mV)	Field pH	Turbidity
MW-36-040	SA	12/8/2015	LF	0.42	ND (1)	---	1,100	-150	7.6	1
MW-36-040	SA	12/7/2016	LF	ND (0.2)	ND (1)	---	1,300	-150	7.8	1
MW-36-050	MA	12/8/2015	LF	ND (0.2)	ND (1)	---	1,100	-81	7.5	1
MW-36-050	MA	12/7/2016	LF	ND (0.2)	ND (1)	---	1,100	-52	7.6	1
MW-36-070	MA	12/8/2015	LF	ND (0.2)	ND (1)	---	1,000	12	7.6	1
MW-36-070	MA	12/7/2016	LF	ND (0.2)	ND (1)	---	1,000	66	7.9	1
MW-36-090	DA	12/8/2015	LF	ND (0.2)	2.2	---	1,100	-49	8.0	1
MW-36-090	DA	4/26/2016	LF	ND (0.2)	ND (1)	---	---	-170	7.7	4
MW-36-090	DA	12/7/2016	LF	ND (0.2)	ND (1)	---	1,100	-4.1	8.2	1
MW-36-100	DA	12/8/2015	LF	63	58	---	7,800	-24	7.2	7
MW-36-100	DA	4/26/2016	LF	38	42	---	---	-81	7.2	8
MW-36-100	DA	12/7/2016	LF	28	28	---	7,500	-40	7.4	4
MW-37D	DA	12/7/2015	LF	6.5	6.3	---	15,000	19	7.6	15
MW-37D	DA	4/27/2016	LF	7.7	7.7	---	---	-4.6	7.5	6
MW-37D	DA	12/8/2016	LF	4.4	ND (5)	---	14,000	-71	7.7	8
MW-37S	MA	12/8/2015	LF	12	11	---	6,200	31	7.6	15
MW-37S	MA	12/8/2016	LF	11	11	---	6,100	-98	7.6	19
MW-38D	DA	12/1/2015	3V	20	23	---	22,000	---	---	---
MW-38D	DA	12/1/2015	LF	19	19	---	22,000	-73	8.0	13
MW-38D	DA	5/3/2016	3V	18	17	---	---	---	---	---
MW-38D	DA	5/3/2016	LF	19	18	---	---	-120	7.8	8
MW-38D	DA	9/29/2016	LF	---	---	---	---	-62	7.8	1
MW-38D	DA	12/7/2016	3V	21	21	---	22,000	-71	7.9	3
MW-38D	DA	12/7/2016	LF	20	21	---	23,000	-140	8.0	9
MW-38S	SA	9/28/2015	3V	ND (0.2)	ND (1)	---	---	---	7.7	1
MW-38S	SA	9/28/2015	LF	ND (0.2)	ND (1)	---	---	---	7.7	1
MW-38S	SA	12/1/2015	3V	ND (0.2)	ND (1)	---	1,500	---	---	---
MW-38S	SA	12/1/2015	LF	ND (0.2)	ND (1)	---	1,500	-140	7.9	4
MW-38S	SA	2/24/2016	3V	ND (0.2)	ND (1)	---	---	---	---	---

Table 3-1

Groundwater Sampling Results, September 2015 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

									Selected Field Parameters		
Location ID	Aquifer Zone	Sample Date		Sample Method	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)	Total Chromium (µg/L)	Specific Conductance (µS/cm)	ORP (mV)	Field pH	Turbidity
MW-38S	SA	2/24/2016		LF	ND (0.2)	ND (1)	---	---	-210	7.8	4
MW-38S	SA	5/3/2016		3V	ND (0.2)	ND (1)	---	---	---	---	---
MW-38S	SA	5/3/2016		LF	ND (0.2)	ND (1)	---	---	-180	7.6	1
MW-38S	SA	9/29/2016		3V	0.99	2.3	---	---	-80	7.8	1
MW-38S	SA	9/29/2016		LF	ND (0.2)	1.4	---	---	---	---	---
MW-38S	SA	12/7/2016		3V	2.7	2.3	---	1,500	-100	8.0	2
MW-38S	SA	12/7/2016		LF	2.2	2.1	---	1,600	-87	8.0	3
MW-38S	SA	12/7/2016	FD	3V	2.5	2.5	---	1,600	---	---	---
MW-39-040	SA	12/4/2015		LF	ND (0.2)	ND (1)	---	1,100	-120	7.9	2
MW-39-040	SA	12/7/2016		LF	ND (0.2)	ND (1)	---	1,200	-150	8.0	4.8
MW-39-050	MA	12/4/2015		LF	ND (0.2)	ND (1)	---	1,100	-120	7.5	2
MW-39-050	MA	12/7/2016		LF	ND (0.2)	ND (1)	---	1,100	12	7.6	1
MW-39-060	MA	12/4/2015		LF	0.46	ND (1)	---	1,200	66	7.8	1
MW-39-060	MA	12/4/2015	FD	LF	0.38	ND (1)	---	1,200	---	---	---
MW-39-060	MA	12/7/2016		LF	ND (0.2)	ND (1)	---	1,200	23	7.7	1
MW-39-070	MA	12/4/2015		LF	0.58	ND (1)	---	1,800	-13	7.6	2
MW-39-070	MA	12/7/2016		LF	ND (0.2)	ND (1)	---	1,800	77	7.7	2
MW-39-080	DA	12/4/2015		LF	ND (0.2)	ND (1)	---	3,100	-120	7.7	2
MW-39-080	DA	12/7/2016		LF	ND (0.2)	ND (1)	---	2,200	33	7.9	1
MW-39-100	DA	12/4/2015		LF	23	24	---	14,000	-220	6.8	2
MW-39-100	DA	4/26/2016		LF	81	79	---	---	-120	6.7	5
MW-39-100	DA	4/26/2016	FD	LF	77	79	---	---	---	---	---
MW-39-100	DA	12/7/2016		LF	77	67	---	15,000	87	6.8	1
MW-40D	DA	12/7/2015		H	82	78	---	16,000	---	---	---
MW-40D	DA	12/7/2015		LF	98	87	---	16,000	38	7.4	3
MW-40D	DA	12/7/2015	FD	H	97	88	---	16,000	---	---	---
MW-40D	DA	5/4/2016		H	120	110	---	---	---	---	---
MW-40D	DA	5/4/2016		LF	130	110	---	---	25	7.3	2
MW-40S	SA	12/7/2015		H	10	9.1	---	2,500	---	---	---

Table 3-1

Groundwater Sampling Results, September 2015 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California

Location ID	Aquifer Zone	Sample Date		Sample Method	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)	Total Chromium (µg/L)	Specific Conductance (µS/cm)	Selected Field Parameters: ORP (mV)	Field pH	Turbidity
MW-40S	SA	12/7/2015		LF	8.1	11	---	2,500	61	7.5	5
MW-41D	DA	12/7/2015		LF	3	2.8	---	21,000	57	7.2	1
MW-41D	DA	4/27/2016		LF	1.3	1.3	---	---	23	7.6	2
MW-41D	DA	12/8/2016		LF	ND (1)	ND (5)	---	22,000	-130	7.7	3
MW-41M	DA	12/7/2015		LF	9.5	15	---	16,000	19	7.2	2
MW-41M	DA	12/7/2015	FD	LF	9.5	14	---	16,000	---	---	---
MW-41M	DA	12/8/2016		LF	9.2	8.9	---	15,000	-120	7.6	30
MW-41S	SA	12/7/2015		LF	15	14	---	5,900	---	---	---
MW-41S	SA	12/8/2016		LF	15	14	---	5,900	-120	7.8	47
MW-42-030	SA	12/3/2015		LF	0.84	ND (1)	---	3,200	-160	7.8	9
MW-42-030	SA	12/6/2016		LF	ND (0.2)	ND (1)	---	2,700	-110	7.9	8.2
MW-42-055	MA	12/3/2015		LF	0.4	2.1	---	1,200	-77	8.2	3
MW-42-055	MA	4/26/2016		LF	0.44	1.6	---	---	-110	8.3	6
MW-42-055	MA	12/6/2016		LF	ND (0.2)	1.4	---	1,100	26	8.5	2
MW-42-065	MA	12/3/2015		LF	ND (0.2)	ND (1)	---	6,000	42	7.4	2
MW-42-065	MA	4/26/2016		LF	ND (0.2)	ND (1)	---	---	-120	7.5	8
MW-42-065	MA	12/6/2016		LF	ND (0.2)	ND (1)	---	4,500	52	7.5	1
MW-42-065	MA	12/6/2016	FD	LF	ND (0.2)	ND (1)	---	4,500	---	---	---
MW-43-025	SA	12/8/2015		LF	ND (0.2)	ND (1)	---	1,400	-110	7.2	3
MW-43-025	SA	12/7/2016		LF	ND (0.2)	ND (1)	---	1,400	-71	7.4	2
MW-43-075	DA	12/2/2015		LF	ND (0.2)	ND (1)	---	10,000	-59	7.0	2
MW-43-075	DA	12/9/2016		LF	ND (1)	ND (1)	---	10,000	-110	7.2	5
MW-43-090	DA	12/2/2015		LF	ND (1)	ND (1)	---	15,000	-38	7.1	12
MW-43-090	DA	12/9/2016		LF	ND (1)	ND (5)	---	16,000	22	7.3	4.6
MW-44-070	MA	12/4/2015		LF	ND (0.2)	ND (1)	---	1,100	39	7.7	6
MW-44-070	MA	4/26/2016		LF	ND (0.2)	15	---	---	-160	18	10
MW-44-070	MA	12/7/2016		LF	ND (0.2)	ND (1)	---	1,700	-39	7.7	2
MW-44-115	DA	10/6/2015		LF	27	27	---	---	55	7.9	8
MW-44-115	DA	10/6/2015	FD	LF	27	26	---	---	---	---	---

Table 3-1

Groundwater Sampling Results, September 2015 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California

Location ID	Aquifer Zone	Sample Date		Sample Method	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)	Total Chromium (µg/L)	Specific Conductance (µS/cm)	Selected Field Parameters ORP (mV)	Field pH	Turbidity
MW-44-115	DA	12/4/2015		LF	26	34	---	11,000	39	7.9	4
MW-44-115	DA	2/25/2016		LF	30	28	---	---	-110	7.9	2
MW-44-115	DA	2/25/2016	FD	LF	29	27	---	---	---	---	---
MW-44-115	DA	4/26/2016		LF	24	23	---	---	14	7.8	6
MW-44-115	DA	10/6/2016		LF	16	18	---	---	---	---	---
MW-44-115	DA	10/6/2016	FD	LF	16	18	---	---	---	---	---
MW-44-115	DA	12/7/2016		LF	25	24	---	12,000	25	7.9	225
MW-44-125	DA	12/4/2015		LF	0.3	2	---	9,300	-40	7.4	2
MW-44-125	DA	12/4/2015	FD	LF	0.23	2.2	---	6,600	---	---	---
MW-44-125	DA	4/26/2016		LF	5.9	14	---	---	-37	7.4	2
MW-44-125	DA	4/26/2016	FD	LF	6.3	14	---	---	---	---	---
MW-44-125	DA	12/7/2016		LF	10	9.4	---	12,000	-45	7.7	1
MW-44-125	DA	12/7/2016	FD	LF	10	11	---	11,000	---	---	---
MW-46-175	DA	10/6/2015		LF	11	11	---	---	46	8.3	1
MW-46-175	DA	12/2/2015		LF	23	21	---	18,000	130	8.2	1
MW-46-175	DA	2/25/2016		LF	18	19	---	---	77	8.2	1
MW-46-175	DA	4/26/2016		LF	11	11	---	---	-40	8.3	2
MW-46-175	DA	10/6/2016		LF	9.1	10	---	---	---	---	---
MW-46-175	DA	12/8/2016		LF	16	16	---	19,000	-11	8.3	5
MW-46-205	DA	12/2/2015		LF	1.6	1.6	---	22,000	96	8.1	1
MW-46-205	DA	4/26/2016		LF	1.2	ND (5)	---	---	-91	8.1	3
MW-46-205	DA	12/8/2016		LF	ND (1)	ND (5)	---	23,000	31	8.3	2
MW-47-055	SA	12/2/2015		LF	23	21	---	4,300	-120	7.4	2
MW-47-055	SA	4/26/2016		3V	16	15	---	---	120	7.1	8
MW-47-055	SA	12/8/2016		LF	17	16	---	5,200	25	7.5	6.2
MW-47-115	DA	12/2/2015		LF	19	17	---	13,000	17	7.3	9
MW-47-115	DA	4/26/2016		LF	24	22	---	---	150	7.6	7
MW-47-115	DA	12/8/2016		LF	17	18	---	14,000	52	7.5	5
MW-48	BR	12/4/2015		LF	ND (1)	ND (1)	---	16,000	130	7.3	10

Table 3-1

Groundwater Sampling Results, September 2015 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California

Location ID	Aquifer Zone	Sample Date		Sample Method	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)	Total Chromium (µg/L)	Specific Conductance (µS/cm)	Selected Field Parameters: ORP (mV)	Field pH	Turbidity
MW-48	BR	5/4/2016		G	ND (1)	1.1	---	---	6.9	7.6	8
MW-48	BR	12/14/2016		G	ND (1)	ND (1)	---	20,000	48	8.1	5
MW-49-135	DA	12/1/2015		3V	1.8	1.8	---	13,000	-190	7.7	1
MW-49-135	DA	12/8/2016		3V	1.5	ND (5)	---	13,000	-54	7.8	5
MW-49-135	DA	12/8/2016	FD	3V	1.4	1.2	---	13,000	---	---	---
MW-49-275	DA	12/8/2016		LF	ND (1)	ND (5)	---	26,000	-12	7.4	5
MW-49-365	DA	12/1/2015	FD	LF	ND (1)	ND (1)	---	38,000	-260	7.5	4
MW-49-365	DA	12/8/2016		LF	ND (1)	ND (5)	---	38,000	-100	7.8	1
MW-50-095	MA	12/8/2015		LF	14	13	---	5,600	35	7.8	9
MW-50-095	MA	12/9/2016		LF	9.2	9.1	---	5,500	-59	7.5	2
MW-50-200	DA	4/27/2016		LF	6,900	7,600	---	---	-270	8.0	4
MW-50-200	DA	12/9/2016		LF	6,000	5,900	---	21,000	-93	7.5	14
MW-51	MA	12/8/2015		LF	4,800	4,900	---	12,000	83	7.3	1
MW-51	MA	12/9/2016		LF	4,200	4,100	---	13,000	-210	7.8	3
MW-52D	DA	4/25/2016		LF	ND (1)	ND (5)	---	---	-180	7.7	3
MW-52D	DA	12/5/2016		LF	ND (1)	ND (5)	---	22,000	-90	7.0	2
MW-52M	DA	12/2/2015		3V	ND (1)	ND (1)	---	15,000	-68	7.3	1
MW-52M	DA	4/25/2016		LF	ND (1)	ND (1)	---	---	-180	7.2	2
MW-52S	MA	12/2/2015		3V	ND (0.2)	ND (1)	---	9,200	-190	7.6	15
MW-52S	MA	12/5/2016		LF	ND (1)	ND (1)	---	9,800	-150	7.7	9
MW-52S	MA	12/5/2016	FD	LF	ND (0.2)	ND (1)	---	9,300	---	---	---
MW-53D	DA	12/2/2015		3V	ND (1)	ND (1)	---	26,000	-130	7.9	1
MW-53D	DA	4/27/2016		LF	ND (5)	ND (5)	---	---	-140	8.0	2
MW-53D	DA	12/5/2016		LF	ND (1)	ND (5)	---	27,000	-82	6.9	2
MW-53M	DA	12/2/2015		3V	ND (1)	ND (1)	---	19,000	-190	7.8	1
MW-53M	DA	4/27/2016		LF	ND (1)	ND (1)	---	---	-120	7.4	3
MW-54-085	DA	12/9/2015		LF	ND (0.2)	ND (1)	---	10,000	-20	7.9	8
MW-54-085	DA	12/9/2015	FD	LF	ND (0.2)	ND (1)	---	10,000	140	8.0	1
MW-54-085	DA	4/29/2016	(a)	LF	ND (0.5)	ND (10)	---	---	-280	7.7	3

Table 3-1

Groundwater Sampling Results, September 2015 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California

Location ID	Aquifer Zone	Sample Date		Sample Method	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)	Total Chromium (µg/L)	Specific Conductance (µS/cm)	Selected Field Parameters ORP (mV)	Field pH	Turbidity
MW-54-085	DA	12/15/2016		3V	---	---	---	---	-110	7.4	3
MW-54-085	DA	12/15/2016	(a)	3V	ND (0.5)	ND (0.2)	---	---	---	---	---
MW-54-140	DA	12/9/2015	(a)	LF	ND (0.5 J)	ND (10)	---	9,870 J	-140	7.5	1
MW-54-140	DA	4/29/2016	(a)	LF	ND (0.5)	ND (10)	---	---	-240	7.2	2
MW-54-140	DA	12/15/2016		3V	---	---	---	---	-120	7.7	24
MW-54-140	DA	12/15/2016	(a)	3V	ND (0.5)	ND (0.2)	---	---	---	---	---
MW-54-195	DA	12/9/2015	(a)	LF	ND (0.5 J)	ND (10)	---	14,700 J	-140	7.1	1
MW-54-195	DA	4/29/2016	(a)	LF	ND (0.5)	ND (10)	---	---	-260	7.0	1
MW-54-195	DA	12/15/2016		LF	---	---	---	---	-97	8.2	1
MW-54-195	DA	12/15/2016	(a)	LF	ND (0.5)	ND (1)	---	---	---	---	---
MW-55-045	MA	12/7/2015		LF	ND (0.2)	ND (1)	---	1,400	-130	6.9	1
MW-55-045	MA	12/7/2015	(a)	LF	ND (0.5 J)	ND (10)	---	1,110 J	---	---	---
MW-55-045	MA	5/5/2016		LF	---	---	---	---	-190	7.6	15
MW-55-045	MA	5/5/2016	(a)	LF	ND (0.5)	ND (10)	---	---	---	---	---
MW-55-045	MA	12/15/2016		LF	---	---	---	---	-14	7.8	22
MW-55-045	MA	12/15/2016	(a)	LF	ND (0.1)	ND (0.2)	---	---	---	---	---
MW-55-120	DA	10/21/2015		LF	7.8 J	6.3 J	---	---	60	7.9	7
MW-55-120	DA	10/21/2015	(a)	LF	7.58 J	7.04	---	---	---	---	---
MW-55-120	DA	12/7/2015		LF	8	8.2	---	8,300	-26	7.9	3
MW-55-120	DA	12/7/2015	(a)	LF	7.5 J	ND (10)	---	6,140 J	---	---	---
MW-55-120	DA	2/24/2016		LF	7.6	8.1	---	---	-87	8.0	8
MW-55-120	DA	2/24/2016	(a)	LF	7.2 J	ND (10)	---	---	---	---	---
MW-55-120	DA	5/5/2016		LF	---	---	---	---	-20	7.9	8
MW-55-120	DA	5/5/2016	(a)	LF	11.1	10.6	---	---	---	---	---
MW-55-120	DA	9/30/2016		LF	---	---	---	---	140	8.0	1
MW-55-120	DA	9/30/2016	(a)	LF	6.39	6.83	---	---	---	---	---
MW-55-120	DA	12/15/2016		3V	---	---	---	---	-110	7.9	13
MW-55-120	DA	12/15/2016	(a)	3V	8.4	8.17	---	---	---	---	---
MW-56D	DA	12/9/2015		3V	ND (1)	ND (1)	---	21,000	-120	6.9	1

Table 3-1

Groundwater Sampling Results, September 2015 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California

Location ID	Aquifer Zone	Sample Date		Sample Method	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)	Total Chromium (µg/L)	Specific Conductance (µS/cm)	Selected Field Parameters: ORP (mV)	Field pH	Turbidity
MW-56D	DA	12/9/2015	(a)	3V	ND (0.5 J)	ND (10)	---	17,000 J	---	---	---
MW-56D	DA	5/5/2016		LF	---	---	---	---	-140	7.5	1
MW-56D	DA	5/5/2016	(a)	LF	ND (0.5)	ND (10)	---	---	---	---	---
MW-56D	DA	12/14/2016		LF	---	---	---	---	-34	7.6	2
MW-56D	DA	12/14/2016	(a)	LF	ND (0.5)	ND (1)	---	---	---	---	---
MW-56M	DA	12/9/2015		Slant	ND (1)	ND (1)	---	15,000	-150	6.9	1
MW-56M	DA	12/9/2015	(a)	Slant	ND (0.5 J)	ND (10)	---	11,900 J	---	---	---
MW-56M	DA	5/5/2016		LF	---	---	---	---	-140	7.1	1
MW-56M	DA	5/5/2016	(a)	LF	ND (0.5)	ND (10)	---	---	---	---	---
MW-56M	DA	12/14/2016		LF	---	---	---	---	-110	7.2	6
MW-56M	DA	12/14/2016	(a)	LF	ND (0.5)	ND (1)	---	---	---	---	---
MW-56S	SA	12/9/2015		Slant	ND (0.2)	ND (1)	---	6,300	-140	6.7	1
MW-56S	SA	12/9/2015	(a)	Slant	ND (0.5 J)	ND (10)	---	5,340 J	---	---	---
MW-56S	SA	5/5/2016		LF	---	---	---	---	-130	6.9	1
MW-56S	SA	5/5/2016	(a)	LF	ND (0.5)	ND (10)	---	---	---	---	---
MW-56S	SA	12/14/2016		LF	---	---	---	---	-110	6.9	2
MW-56S	SA	12/14/2016	(a)	LF	ND (0.1)	ND (0.2)	---	---	---	---	---
MW-57-070	BR	12/4/2015		3V	520	550	---	1,800	-23	7.1	6
MW-57-070	BR	4/28/2016		3V	470	510	---	---	87	7.2	8
MW-57-070	BR	12/13/2016		LF	400	420	---	2,400	85	7.2	28
MW-57-185	BR	12/4/2015		3V	9.9	8.5	---	18,000	-45	8.3	5
MW-57-185	BR	4/28/2016		3V	4.6	5.6	---	---	-36	9.8	5
MW-57-185	BR	12/13/2016		3V	7.1	7.3	---	20,000	32	8.9	1
MW-58BR	BR	9/30/2015		LF	ND (0.2)	ND (1)	---	---	---	7.5	7
MW-58BR	BR	12/7/2015		LF	2.9	2.9	---	8,500	-15	7.5	6
MW-58BR	BR	2/24/2016		LF	4.1	4.5	---	---	40	7.4	5
MW-58BR	BR	4/28/2016		LF	0.56	ND (1)	---	---	-7.4	7.6	1
MW-58BR	BR	4/28/2016	FD	LF	0.6	ND (1)	---	---	---	---	---
MW-58BR	BR	9/27/2016		LF	2.7	2.7	---	---	-170	7.2	6

Table 3-1

Groundwater Sampling Results, September 2015 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California

Location ID	Aquifer Zone	Sample Date		Sample Method	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)	Total Chromium (µg/L)	Specific Conductance (µS/cm)	Selected Field Parameters ORP (mV)	Field pH	Turbidity
MW-58BR	BR	12/13/2016		LF	4.3	3.9	---	8,600	66	7.6	2
MW-59-100	SA	12/3/2015		LF	4,500	4,300	---	11,000	62	6.9	6
MW-59-100	SA	12/3/2015	FD	LF	4,400	4,400	---	11,000	---	---	---
MW-59-100	SA	4/29/2016		LF	3,300	3,400	---	---	100	7.0	4
MW-59-100	SA	12/7/2016		LF	3,600	3,500	---	9,500	77	7.0	5
MW-59-100	SA	12/7/2016	FD	LF	3,400	3,500	---	9,300	---	---	---
MW-60-125	BR	12/4/2015		3V	960	840	---	7,800	60	7.4	27
MW-60-125	BR	4/28/2016		3V	940	990	---	---	64	7.2	8
MW-60-125	BR	12/14/2016		LF	880	840	---	9,100	84	7.4	18
MW-60BR-245	BR	9/29/2015		3V	ND (1)	1.4	---	---	---	8.2	4
MW-60BR-245	BR	12/4/2015		3V	61	53	---	17,000	-250	7.9	1
MW-60BR-245	BR	2/23/2016		3V	ND (1)	ND (5)	---	---	-81	8.1	2
MW-60BR-245	BR	4/29/2016		G	ND (1)	ND (5)	---	---	-150	8.0	10
MW-60BR-245	BR	9/29/2016		3V	ND (1)	37	---	---	-150	8.0	1
MW-60BR-245	BR	12/14/2016		3V	ND (1)	ND (1)	---	19,000	-65	8.2	1
MW-61-110	BR	12/4/2015		3V	540	530	---	15,000	-34	7.6	6
MW-61-110	BR	4/29/2016		LF	410	400	---	---	-55	7.5	5
MW-61-110	BR	12/13/2016		3V	520	500	---	17,000	-67	7.4	7
MW-62-065	BR	10/7/2015		3V	560	610	---	---	70	7.3	10
MW-62-065	BR	12/3/2015		3V	570	570	---	6,400	63	7.3	10
MW-62-065	BR	2/23/2016		3V	560	620	---	---	-34	7.4	5
MW-62-065	BR	5/2/2016		3V	670	690	---	---	-47	7.4	4
MW-62-065	BR	9/28/2016		LF	350	340	---	---	-46	7.4	5
MW-62-065	BR	12/13/2016		LF	600	550	---	6,500	-70	7.4	14
MW-62-110	BR	10/1/2015		Flute	ND (10)	2.6	---	---	---	6.6	1
MW-62-110	BR	12/4/2015		3V	0.29	ND (1)	---	8,400	-140	7.7	13
MW-62-110	BR	2/24/2016		3V	ND (1)	ND (1)	---	---	-99	7.6	12
MW-62-110	BR	5/3/2016		Tap	1.2	ND (1)	---	---	-150	7.6	5
MW-62-110	BR	9/28/2016		Flute	ND (1)	ND (1)	---	---	-130	8.0	31

Table 3-1

Groundwater Sampling Results, September 2015 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California

Location ID	Aquifer Zone	Sample Date		Sample Method	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)	Total Chromium (µg/L)	Specific Conductance (µS/cm)	Selected Field Parameters ORP (mV)	Field pH	Turbidity
MW-62-110	BR	12/14/2016		G	ND (1)	ND (1)	---	10,000	20	7.3	4
MW-62-190	BR	12/4/2015		3V	ND (1)	ND (1)	---	17,000	-220	7.7	5
MW-62-190	BR	5/3/2016		Tap	ND (1)	ND (5)	---	---	-130	7.9	5
MW-62-190	BR	12/14/2016		G	ND (1)	ND (5)	---	20,000	-210	7.4	4
MW-63-065	BR	9/28/2015		3V	1.3	1.2	---	---	68	7.1	2
MW-63-065	BR	12/4/2015		3V	1.7	7.7	---	6,800	29	7.3	9
MW-63-065	BR	2/23/2016		3V	1.5	2.1	---	---	-41	7.1	8
MW-63-065	BR	4/28/2016		3V	1.5	2.2	---	---	76	6.9	6
MW-63-065	BR	4/28/2016	FD	3V	1.5	2.2	---	---	---	---	---
MW-63-065	BR	9/30/2016		LF	1.4	1.7	---	---	150	7.1	7
MW-63-065	BR	9/30/2016	FD	LF	1.3	1.7	---	---	---	---	---
MW-63-065	BR	12/13/2016		LF	1.3	2.2	---	7,000	-65	7.1	7
MW-64BR	BR	10/1/2015		LF	ND (1)	1.5	---	---	---	7.4	23
MW-64BR	BR	12/7/2015		LF	ND (1)	ND (1)	---	14,000	-100	7.3	3
MW-64BR	BR	2/22/2016		LF	ND (1)	ND (1)	---	---	-74	7.3	70
MW-64BR	BR	5/2/2016		LF	ND (1)	ND (1)	---	---	-120	7.3	9
MW-64BR	BR	9/28/2016		LF	ND (1)	ND (1)	---	---	-65	7.3	3
MW-64BR	BR	12/13/2016		LF	ND (1)	ND (5)	---	14,000	-84	7.4	7
MW-64BR	BR	12/13/2016	FD	LF	ND (1)	ND (5)	---	14,000	---	---	---
MW-65-160	SA	9/30/2015		LF	140	150	---	---	56	7.2	8
MW-65-160	SA	12/2/2015		LF	130	160	---	3,500	28	7.0	31
MW-65-160	SA	2/24/2016		LF	140	150	---	---	-25	7.2	29
MW-65-160	SA	5/3/2016		LF	130	130	---	---	45	7.2	32
MW-65-160	SA	9/29/2016		LF	150	160	---	---	10	7.1	6
MW-65-160	SA	12/6/2016		LF	160	150	---	3,700	41	7.2	2
MW-65-225	DA	9/30/2015		LF	180	210	---	---	29	7.4	9
MW-65-225	DA	12/2/2015		LF	250	250	---	15,000	99	7.3	10
MW-65-225	DA	2/24/2016		LF	510	490 J	---	---	-71	7.3	10
MW-65-225	DA	5/3/2016		LF	130	130	---	---	4.9	7.5	7

Table 3-1

Groundwater Sampling Results, September 2015 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,

PG&E Topock Compressor Station, Needles, California

Location ID	Aquifer Zone	Sample Date		Sample Method	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)	Total Chromium (µg/L)	Specific Conductance (µS/cm)	Selected Field Parameters ORP (mV)	Field pH	Turbidity
MW-65-225	DA	9/29/2016		LF	87	110	---	---	-45	7.5	10
MW-65-225	DA	12/6/2016		LF	150	140	---	16,000	-37	7.6	22
MW-66-165	SA	12/2/2015		LF	490	540	---	4,000	81	7.4	58
MW-66-165	SA	4/25/2016		LF	660	600	---	---	110	7.2	2
MW-66-165	SA	12/5/2016		LF	460	450	---	3,900	61	7.3	6
MW-66-230	DA	12/3/2015		LF	7,700	6,800	---	19,000	38	7.8	5
MW-66-230	DA	4/25/2016		LF	7,500	6,700	---	---	63	7.8	1
MW-66-230	DA	12/5/2016		LF	7,000	7,300	---	18,000	51	7.9	4
MW-66BR-270	BR	12/9/2015		3V	ND (1)	ND (1)	---	15,000	-310	9.3	22
MW-66BR-270	BR	5/4/2016		3V	ND (0.2)	ND (1)	---	---	-350	8.1	8
MW-66BR-270	BR	12/15/2016		3V	ND (0.2)	ND (1)	---	5,400	---	---	---
MW-67-185	SA	12/2/2015		LF	1,700	1,700	---	6,800	67	7.2	137
MW-67-185	SA	5/3/2016		LF	1,800	1,800	---	---	120	7.2	5
MW-67-185	SA	12/5/2016		LF	1,600	1,600	---	6,900	-26	7.2	9
MW-67-225	MA	12/2/2015		LF	3,400	3,300	---	7,100	40	7.6	119
MW-67-225	MA	5/3/2016		LF	3,400	3,300	---	---	89	7.6	26
MW-67-225	MA	5/3/2016	FD	LF	3,500	3,300	---	---	---	---	---
MW-67-225	MA	12/5/2016		LF	3,000	2,900	---	7,100	-86	7.8	1,000
MW-67-260	DA	12/2/2015		LF	1,100	1,100	---	17,000	-26	8.4	7
MW-67-260	DA	5/3/2016		LF	620	670	---	---	12	8.4	2
MW-67-260	DA	12/5/2016		LF	1,000	950	---	18,000	-180	9.7	10
MW-67-260	DA	12/5/2016	FD	LF	1,000	1,000	---	18,000	---	---	---
MW-68-180	SA	9/30/2015		LF	32,000	44,000	---	---	70	7.3	8
MW-68-180	SA	9/30/2015	FD	LF	32,000	44,000	---	---	---	---	---
MW-68-180	SA	12/2/2015		LF	36,000	40,000	---	4,600	130	7.2	18
MW-68-180	SA	2/24/2016		LF	37,000	42,000	---	---	2.7	7.4	40
MW-68-180	SA	5/4/2016		LF	12,000	11,000	---	---	64	7.3	3
MW-68-180	SA	9/29/2016		LF	31,000	34,000	---	---	77	7.5	3
MW-68-180	SA	12/6/2016		LF	38,000	42,000	---	4,700	-55	7.5	4

Table 3-1

Groundwater Sampling Results, September 2015 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California

Location ID	Aquifer Zone	Sample Date		Sample Method	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)	Total Chromium (µg/L)	Specific Conductance (µS/cm)	Selected Field Parameters ORP (mV)	Field pH	Turbidity
MW-68-240	DA	12/2/2015		LF	2,300	2,200	---	16,000	120	7.1	3
MW-68-240	DA	5/4/2016		LF	2,100	2,100	---	---	26	7.2	9
MW-68-240	DA	12/6/2016		LF	2,100	2,200	---	16,000	-99	7.5	10
MW-68BR-280	BR	12/3/2015		LF	ND (1)	ND (1)	---	21,000	-170	8.7	6
MW-68BR-280	BR	5/4/2016		LF	ND (1)	ND (1)	---	---	-160	8.6	4
MW-68BR-280	BR	12/6/2016		3V	ND (1)	ND (1)	---	21,000	-210	9.1	5
MW-69-195	BR	10/1/2015		3V	890	940	---	---	79	7.3	1
MW-69-195	BR	12/4/2015		3V	830	790	---	3,300	-30	7.4	5
MW-69-195	BR	2/24/2016		3V	620	670	---	---	26	7.3	9
MW-69-195	BR	2/24/2016	FD	3V	610	660	---	---	---	---	---
MW-69-195	BR	4/25/2016		3V	660	660	---	---	130	7.2	3
MW-69-195	BR	9/29/2016		LF	640	680	---	---	81	7.3	1
MW-69-195	BR	12/6/2016		LF	670	740	---	3,500	2.2	7.4	2
MW-70-105	BR	12/7/2015		3V	150	140	---	3,800	52	7.7	3
MW-70-105	BR	4/28/2016		LF	120	140	---	---	11	7.9	29
MW-70-105	BR	12/14/2016		LF	140	140	---	3,700	-85	7.7	13
MW-70BR-225	BR	12/7/2015		3V	2,000	2,000	---	14,000	83	7.3	3
MW-70BR-225	BR	4/28/2016		3V	2,000	2,100	---	---	79	7.4	25
MW-70BR-225	BR	12/14/2016		3V	1,900	1,800	---	14,000	-57	7.3	2
MW-70BR-225	BR	12/14/2016	FD	3V	1,900	1,800	---	14,000	---	---	---
MW-71-035	SA	12/4/2015		LF	1.2	15	---	15,000	140	6.9	287
MW-71-035	SA	5/3/2016		LF	ND (1)	ND (5)	---	---	-49	6.6	92
MW-71-035	SA	5/3/2016	FD	LF	ND (1)	ND (1)	---	---	---	---	---
MW-71-035	SA	12/14/2016		G	ND (1)	ND (1)	---	15,000	50	6.7	48
MW-72-080	BR	9/29/2015		3V	130	120	---	---	48	7.7	1
MW-72-080	BR	12/7/2015		3V	140	120	---	17,000	50	7.4	3
MW-72-080	BR	2/23/2016		3V	120	110	---	---	-86	7.7	29
MW-72-080	BR	4/29/2016		3V	100	89	---	---	-12	7.5	8
MW-72-080	BR	9/28/2016		LF	86	84	---	---	-120	7.8	5

Table 3-1

Groundwater Sampling Results, September 2015 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California

									Selected Field Parameters		
Location ID	Aquifer Zone	Sample Date		Sample Method	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)	Total Chromium (µg/L)	Specific Conductance (µS/cm)	ORP (mV)	Field pH	Turbidity
MW-72-080	BR	12/12/2016		LF	---	120	---	17,000	-94	7.7	15
MW-72-080	BR	12/15/2016		LF	120	---	---	---	---	---	---
MW-72BR-200	BR	9/29/2015		3V	4.2	4.1	---	---	25	8.2	1
MW-72BR-200	BR	12/8/2015		3V	6.4	6.2	---	17,000	-110	8.0	1
MW-72BR-200	BR	2/23/2016		3V	6	5.6	---	---	-300	8.3	2
MW-72BR-200	BR	4/28/2016		3V	3.9	3.6	---	---	-150	8.0	3
MW-72BR-200	BR	9/28/2016		3V	4.2	4.3	---	---	-170	8.2	1
MW-72BR-200	BR	12/12/2016		3V	5.3	4.8	---	15,000	-120	8.2	4
MW-73-080	BR	9/29/2015		3V	51	45	---	---	47	7.4	16
MW-73-080	BR	12/8/2015		3V	48	43	---	12,000	85	7.3	45
MW-73-080	BR	2/23/2016		3V	53	49	---	---	-29	7.4	11
MW-73-080	BR	4/29/2016		3V	20	20	---	---	100	7.7	120
MW-73-080	BR	9/28/2016		G	23	22	---	---	-100	7.3	7
MW-73-080	BR	12/12/2016		LF	26	25 J	---	11,000	-80	7.4	34
MW-73-080	BR	12/12/2016	FD	LF	29	33 J	---	11,000	---	---	---
MW-74-240	BR	12/7/2015		3V	0.31	8.2	---	890	-150	8.6	269
MW-74-240	BR	4/27/2016		LF	ND (0.2)	ND (1)	---	---	-74	8.6	61
MW-74-240	BR	12/8/2016		LF	0.38	ND (1)	---	850	150	8.4	19
OW-03D	DA	12/7/2015		LF	13	12	---	10,000	-95	7.6	2
OW-03D	DA	12/8/2016		LF	12	13	---	9,800	28	8.9	1
OW-03M	MA	12/7/2015		LF	17	18	---	6,200	-140	7.9	5
OW-03M	MA	12/8/2016		LF	15	16	---	6,300	22	7.9	7
OW-03S	SA	12/7/2015		3V	25	25	---	1,500	44	7.8	10
OW-03S	SA	12/7/2015	FD	3V	25	24	---	1,500	---	---	---
OW-03S	SA	12/8/2016		3V	21	22	---	1,500	28	7.8	2
PE-01	DA	9/1/2015		Tap	0.43	1.4	---	4,100	---	---	---
PE-01	DA	10/6/2015		Tap	3.2	2.7	---	4,200	---	---	---
PE-01	DA	10/27/2015		Tap	---	2.7	---	4,000	31	7.8	---
PE-01	DA	11/3/2015		3V	3.4	3.1	---	4,400	---	---	---

Table 3-1

Groundwater Sampling Results, September 2015 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

									Selected Field Parameters		
Location ID	Aquifer Zone	Sample Date		Sample Method	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)	Total Chromium (µg/L)	Specific Conductance (µS/cm)	ORP (mV)	Field pH	Turbidity
PE-01	DA	11/10/2015		Tap	---	3.5	---	4,100	170	7.6	2
PE-01	DA	12/1/2015		3V	3.6	3.3	---	4,200	---	---	---
PE-01	DA	12/7/2015		Tap	3.8	---	---	4,400	2.1	8.0	1
PE-01	DA	1/6/2016		Tap	3.8	3.6	---	4,300	---	---	---
PE-01	DA	2/2/2016		Tap	3.9	3.3	---	4,100	---	---	---
PE-01	DA	2/3/2016		Tap	---	---	---	---	220	7.3	1.91
PE-01	DA	3/2/2016		Tap	0.79	ND (1)	---	4,100	200	7.1	2.02
PE-01	DA	4/27/2016		Tap	1.2	1.1	---	3,600	35	7.5	4
PE-01	DA	5/10/2016		Tap	ND (0.2)	ND (1)	---	3,400	25	7.3	3
PE-01	DA	6/7/2016		Tap	0.83	ND (1)	---	3,700	---	---	---
PE-01	DA	7/6/2016		Tap	ND (0.2)	ND (1)	---	4,100	---	---	---
PE-01	DA	8/3/2016		Tap	0.8	ND (1)	---	4,000	---	---	---
PE-01	DA	9/8/2016		Tap	1.1	1.1	---	4,200	-5.3	7.3	1
PE-01	DA	10/6/2016		Tap	0.57	ND (1)	---	4,500	---	---	---
PE-01	DA	10/6/2016	FD	Tap	0.82	ND (1)	---	4,500	---	---	---
PE-01	DA	11/2/2016		Tap	2	1.7	---	4,700	---	---	---
PE-01	DA	12/6/2016		Tap	1.2	1.1	---	4,400	7.3	7.6	3
PGE-07BR	BR	12/2/2015		3V	ND (1)	ND (1)	---	19,000	-300	6.9	19
PGE-07BR	BR	12/7/2016		3V	ND (1)	ND (1)	---	20,000	-280	7.3	38
PGE-08	BR	12/10/2015		3V	ND (1)	ND (1)	---	20,000	-120	8.1	2
PGE-08	BR	12/7/2016		3V	ND (1)	ND (1)	---	19,000	-190	8.3	5
PM-03	0	12/8/2015		Tap	9.3	8.8	---	1,600	-37	7.4	1
PM-03	0	4/5/2016		Tap	9.5	9.2	9.3	1,500	---	---	---
PM-03	0	12/9/2016		Tap	9.4	9.4	8.7	1,500	46	7.5	2
PM-04	0	12/8/2015		Tap	17	17	---	2,300	-26	7.4	1
PM-04	0	4/5/2016		Tap	17	17	17	---	---	---	---
PM-04	0	12/9/2016		Tap	4.8	4.1	15	1,900	42	8.0	4
PM-04	0	12/9/2016	FD	Tap	4.9	4.4	14	1,900	---	---	---
TW-01	SA	12/1/2015		3V	2,400	2,300	---	7,500	64	7.6	1

Table 3-1

Groundwater Sampling Results, September 2015 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

Location ID	Aquifer Zone	Sample Date		Sample Method	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)	Total Chromium (µg/L)	Specific Conductance (µS/cm)	Selected Field Parameters ORP (mV)	Field pH	Turbidity
TW-01	SA	5/3/2016		Tap	2,400	2,100	---	---	31	7.0	4
TW-02D	DA	12/9/2015		Tap	96	88	---	8,200	99	7.8	1
TW-02D	DA	12/9/2015	FD	Tap	97	88	---	8,100	---	---	---
TW-02D	DA	5/10/2016		Tap	46	47	---	7,600	87	7.1	2
TW-02D	DA	7/6/2016		Tap	52	57	---	6,200	---	---	---
TW-02D	DA	12/13/2016		Tap	ND (0.2)	ND (1)	---	6,800	120	7.2	3
TW-02S	SA	9/1/2015		Tap	330	330	---	2,400	---	---	---
TW-02S	SA	12/9/2015		Tap	330	330	---	2,200	190	7.5	1
TW-02S	SA	12/13/2016		Tap	64	93	---	3,900	130	7.7	1
TW-03D	DA	9/1/2015		Tap	720	720	---	7,700	---	---	---
TW-03D	DA	10/6/2015		Tap	700	680	---	7,700	---	---	---
TW-03D	DA	10/27/2015		Tap	760	---	---	7,600	51	7.4	2
TW-03D	DA	11/3/2015		3V	740	670	---	8,300	---	---	---
TW-03D	DA	11/10/2015		Tap	720	740	---	7,800	220	7.3	2
TW-03D	DA	12/1/2015		3V	730	690	---	8,100	---	---	---
TW-03D	DA	12/7/2015		Tap	750 J	---	---	8,200	-4.4	7.5	5
TW-03D	DA	1/6/2016		Tap	740	740	---	8,300	---	---	---
TW-03D	DA	2/2/2016		Tap	730	720	---	7,800	200	7.3	4.33
TW-03D	DA	3/2/2016		Tap	790	840	---	7,800	190	7.2	6.27
TW-03D	DA	4/27/2016		Tap	620	660	---	8,100	30	7.2	4
TW-03D	DA	5/10/2016		Tap	610	620	---	7,400	4.0	7.1	4
TW-03D	DA	6/7/2016		Tap	630	610	---	7,400	---	---	---
TW-03D	DA	7/6/2016		Tap	610	650	---	7,800	---	---	---
TW-03D	DA	8/3/2016		Tap	530	630	---	7,300	---	---	---
TW-03D	DA	9/8/2016		Tap	600	580	---	7,400	12	6.9	2
TW-03D	DA	10/6/2016		Tap	580	650	---	7,700	---	---	---
TW-03D	DA	11/2/2016		Tap	590	630	---	8,100	---	---	---
TW-03D	DA	11/2/2016	FD	Tap	590	620	---	8,000	---	---	---
TW-03D	DA	12/6/2016		Tap	630	610	---	7,800	16	7.4	4

Table 3-1

Groundwater Sampling Results, September 2015 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California

Location ID	Aquifer Zone	Sample Date	Sample Method	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)	Total Chromium (µg/L)	Specific Conductance (µS/cm)	Selected Field Parameters: ORP (mV)	Field pH	Turbidity
TW-04	DA	12/8/2015	3V	6.9	6.4	---	---	73	7.7	2
TW-05	DA	12/8/2015	3V	16	14	---	16,000	110	7.7	2

Notes:

(a) = ADHS approved lab
--- = data were either not collected, not available or were rejected
ADHS = Arizona Department of Health Services
FD = field duplicate sample.
J = concentration or reporting limit (RL) estimated by laboratory or data validation.
mV = millivolts.
ND = not detected at listed RL.
ORP = oxidation-reduction potential.
RL = reporting limit.
UF = unfiltered.
µg/L = micrograms per liter.
µS/cm = microSiemens per centimeter.

Sample Methods:
3V = three volume.
Flute = flexible liner underground technologies sampling system.
G = Grab sample.
H = HydraSleeve
LF = Low Flow (minimal drawdown)
Slant = slant (non vertical) wells MW-52, MW-53, MW-56 are sampled from dedicated Barcad screens, using a peristaltic pump.
SS = System Sample
Tap = sampled from tap or port of extraction or supply well.

Wells are assigned to separate aquifer zones for results reporting:
SA = shallow interval of Alluvial Aquifer.

Table 3-1

Groundwater Sampling Results, September 2015 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California

								Selected Field Parameters		
Location ID	**Aquifer Zone**	**Sample Date**	**Sample Method**	**Hexavalent Chromium (µg/L)**	**Dissolved Chromium (µg/L)**	**Total Chromium (µg/L)**	**Specific Conductance (µS/cm)**	**ORP (mV)**	**Field pH**	**Turbidity**

MA = mid-depth interval of Alluvial Aquifer.
DA = deep interval of Alluvial Aquifer.
PA = perched aquifer (unsaturated zone).
BR = well completed in bedrock (Miocene Conglomerate or pre-Tertiary crystalline rock).

Beginning February 1, 2008, hexavalent chromium samples are field-filtered per DTSC-approved change from analysis Method SW7199 to E218.6.

The RLs for certain hexavalent chromium results from Method E218.6 analyses have been elevated above the standard RL of 0.2 ug/L due to required sample dilution to accommodate matrix interferences.

Starting in Third Quarter 2014, the groundwater sample collection method was switched from the traditional three-volume purge method (3V) to the low flow (LF) method at many short screen wells screened in alluvial sediments. The method for purging prior to sample collection is indicated in the sample method column of this table.

ORP is reported to two significant figures. Specific conductance is reported to three significant figures.

Table 3-2a

Groundwater COPCs and In Situ Byproducts Sampling Results, January 2016 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California

Location ID	Aquifer Zone	Sample Date		Sample Method	Arsenic Dissolved (µg/L)	Molybdenum Dissolved (µg/L)	Selenium Dissolved (µg/L)	Manganese Dissolved (µg/L)	Nitrate as N (mg/L)
MW-09	SA	5/3/2016		LF	1.8	4.5	5.7	ND (0.5)	11
MW-09	SA	12/7/2016		LF	1.8	3.3	5.5	ND (0.5)	12
MW-10	SA	5/3/2016		LF	--	25	4.8	--	11
MW-10	SA	12/7/2016		LF	3	23	6.9	3.4	12
MW-11	SA	5/3/2016		LF	1.5	6.3	4.7	ND (0.5)	6
MW-11	SA	5/3/2016	FD	LF	1.5	6.3	4.9	ND (0.5)	6.1
MW-11	SA	12/7/2016		LF	1.5	6.4	5.4	ND (0.5)	5.6
MW-11	SA	12/7/2016	FD	LF	1.4	6	5.1	ND (0.5)	5.6
MW-12	SA	5/2/2016		LF	--	11	24	--	16
MW-12	SA	12/7/2016		3V	41	12	24	1.4	16
MW-13	SA	12/8/2016		LF	1.4	11	2.7	ND (0.5)	--
MW-14	SA	4/27/2016		LF	0.86	14	2.3	0.57	3.5
MW-14	SA	12/8/2016		LF	0.91	14	2.5	ND (0.5)	3.3
MW-15	SA	12/12/2016		LF	--	18	4.3	ND (0.5)	--
MW-18	SA	12/8/2016		LF	--	6.6	4.1	ND (0.5)	--
MW-19	SA	12/8/2016		LF	0.96	5.4	3.3	ND (0.5)	--
MW-20-070	SA	4/27/2016		LF	--	38	5.3	--	8.5
MW-20-070	SA	12/9/2016		LF	--	40	5.5	ND (0.5)	8
MW-20-100	MA	4/27/2016		LF	--	3.4	5	--	8.6
MW-20-100	MA	12/9/2016		LF	--	4.2	5.8	ND (0.5)	8.1
MW-20-130	DA	4/27/2016		LF	4.6	71	16	3.1	10
MW-20-130	DA	12/9/2016		LF	5.2	68	22	ND (2.5)	12
MW-20-130	DA	12/9/2016	FD	LF	5.3	75	21	2.2	11
MW-21	SA	5/3/2016		G	--	97	15	--	1.6
MW-21	SA	12/14/2016		LF	--	120	31	33	0.31
MW-22	SA	4/25/2016		LF	13	--	--	1,700	--
MW-22	SA	12/6/2016		LF	16	39	ND (2.5)	4,500	--
MW-23-060	BR	5/2/2016		3V	4.1	--	--	3.6	--
MW-23-060	BR	12/14/2016		LF	5.7	23	5.3	3.7	--
MW-23-080	BR	5/2/2016		3V	4	--	--	4.3	--
MW-23-080	BR	12/14/2016		LF	5.1	43	5.6	4.4	--
MW-23-080	BR	12/14/2016	FD	LF	4.9	41	5.7	4.2	--
MW-24A	SA	5/3/2016		LF	ND (0.1)	130	ND (0.5)	18	ND (0.05)
MW-24A	SA	12/6/2016		LF	0.13	130	ND (0.5)	22	ND (0.05)
MW-24B	DA	5/3/2016		LF	2.8	59	ND (12)	95	0.41
MW-24B	DA	5/3/2016	FD	LF	3.1	62	ND (2.5)	98	0.44
MW-24B	DA	12/6/2016		LF	1.4	63	ND (2.5)	85	1.1
MW-24BR	BR	12/7/2016		3V	ND (0.5)	65	ND (2.5)	130	ND (0.05)
MW-25	SA	4/27/2016		LF	1.1	2.8	6.7	ND (0.5)	9.7
MW-25	SA	12/8/2016		LF	1.4	5.1	7.5	ND (0.5)	9.3
MW-26	SA	4/28/2016		LF	2	35	50	ND (0.5)	21
MW-26	SA	12/8/2016		LF	1.9	29	45	ND (0.5)	22
MW-26	SA	12/8/2016	FD	LF	1.8	31	43	ND (0.5)	21
MW-27-020	SA	12/6/2016		LF	1.3	6.3	ND (0.5)	63	ND (0.05)
MW-27-060	MA	12/6/2016		LF	8.3	4.4	ND (0.5)	220	ND (0.05)
MW-27-060	MA	12/6/2016	FD	LF	8	4.1	ND (0.5)	210	ND (0.05)
MW-27-085	DA	4/25/2016		LF	1.3	16	ND (0.5)	83	ND (0.05)
MW-27-085	DA	4/25/2016	FD	LF	1.3	16	ND (0.5)	82	ND (0.05)
MW-27-085	DA	12/6/2016		LF	1.5	21	ND (2.5)	69	ND (0.05)
MW-28-025	SA	4/26/2016		LF	1	5	ND (0.5)	9.6	ND (0.05)
MW-28-025	SA	12/8/2016		LF	0.84	5.6	ND (0.5)	ND (0.5)	ND (0.05)
MW-28-090	DA	4/26/2016		LF	2.2	23	ND (0.5)	240	ND (0.05)
MW-28-090	DA	12/8/2016		LF	2.5	27	ND (0.5)	290	ND (0.05)
MW-29	SA	4/26/2016		LF	13 J	20 J	4.9 J	450 J	0.21
MW-29	SA	12/8/2016		LF	12	12	ND (0.5)	390	ND (0.05)
MW-30-030	SA	12/6/2016		LF	2.7	97	ND (2.5)	230	ND (0.1)
MW-30-050	MA	12/6/2016		LF	2.9	4.6	ND (0.5)	200	ND (0.05)
MW-31-060	SA	4/27/2016		LF	1.1	--	--	ND (0.5)	--
MW-31-060	SA	12/9/2016		LF	1.2	15	3.2	ND (0.5)	4.1
MW-31-060	SA	12/9/2016	FD	LF	1.2	16	2.9	ND (0.5)	4.1
MW-31-135	DA	12/9/2016		LF	3.9	26	ND (2.5)	1.8	--
MW-32-020	SA	12/6/2016		LF	4.9	390	ND (12)	280	--
MW-32-035	SA	4/25/2016		LF	27	--	--	820	--
MW-32-035	SA	12/6/2016		LF	13	12	ND (2.5)	840	ND (0.05)
MW-33-040	SA	4/26/2016		LF	12	110 J	ND (0.5)	13	ND (0.05)

Table 3-2a

Groundwater COPCs and In Situ Byproducts Sampling Results, January 2016 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California

Location ID	Aquifer Zone	Sample Date		Sample Method	Arsenic Dissolved (µg/L)	Molybdenum Dissolved (µg/L)	Selenium Dissolved (µg/L)	Manganese Dissolved (µg/L)	Nitrate as N (mg/L)
MW-33-040	SA	4/26/2016	FD	LF	12	120	ND (0.5)	15	ND (0.05)
MW-33-040	SA	12/8/2016		LF	11	450	ND (2.5)	ND (0.5)	0.47
MW-33-090	MA	4/26/2016		3V	1	10	ND (2.5)	3.2	1.1
MW-33-090	MA	12/8/2016		LF	1.2	ND (12)	ND (2.5)	3.3	1.1
MW-33-150	DA	4/26/2016		LF	1.3	42	ND (2.5)	0.97	1.5
MW-33-150	DA	12/8/2016		LF	1.8	45	ND (2.5)	ND (2.5)	1.4
MW-33-210	DA	4/26/2016		LF	1	16	ND (2.5)	ND (2.5)	1.7
MW-33-210	DA	12/8/2016		3V	1.2	18	ND (2.5)	5.6	1.8
MW-34-055	MA	12/6/2016		LF	2.4	5	ND (0.5)	86	ND (0.05)
MW-34-080	DA	4/26/2016		LF	1.3	--	--	38	--
MW-34-080	DA	12/6/2016		LF	1.3	14	ND (2.5)	33	--
MW-34-080	DA	12/6/2016	FD	LF	1.3	14	ND (2.5)	33	--
MW-34-100	DA	2/25/2016		LF	1.9	73	ND (2.5)	33	0.13
MW-34-100	DA	4/26/2016		LF	1.1	41	ND (0.5)	57	ND (0.05)
MW-34-100	DA	10/6/2016		LF	--	--	--	--	ND (0.05)
MW-34-100	DA	12/6/2016		LF	1.2	51	ND (2.5)	36	0.078
MW-35-060	SA	4/27/2016		LF	0.99	9.6	0.94	ND (0.5)	2.2
MW-35-060	SA	4/27/2016	FD	LF	1	9.9	1.3	ND (0.5)	2.1
MW-35-060	SA	12/9/2016		LF	1.1	9	ND (2.5)	ND (0.5)	2
MW-35-135	DA	4/27/2016		LF	0.81	22	1.1	3.1	2.5
MW-35-135	DA	12/9/2016		LF	0.95	25	ND (2.5)	0.62	2.5
MW-35-135	DA	12/9/2016	FD	LF	0.91	25	ND (2.5)	0.6	2.6
MW-36-020	SA	12/7/2016		LF	1.9	37	ND (2.5)	390	--
MW-36-040	SA	12/7/2016		LF	5.6	6.1	ND (0.5)	110	ND (0.05)
MW-36-050	MA	12/7/2016		LF	4.4	3.8	ND (0.5)	250	--
MW-36-070	MA	12/7/2016		LF	3.2	4.9	ND (0.5)	240	--
MW-36-090	DA	4/26/2016		LF	7.2	--	--	79	--
MW-36-090	DA	12/7/2016		LF	18	8.2	ND (0.5)	25	--
MW-36-100	DA	4/26/2016		LF	6.5	22	ND (0.5)	240	0.075
MW-36-100	DA	12/7/2016		LF	6.6	28	ND (2.5)	110	0.06
MW-37D	DA	4/27/2016		LF	--	54	ND (2.5)	--	0.18
MW-37D	DA	12/8/2016		LF	4.4	58	ND (2.5)	4.8	0.16
MW-37S	MA	12/8/2016		LF	1.9	16	0.8	2.1	--
MW-38D	DA	5/3/2016		3V	7.6	86	ND (2.5)	56	ND (0.05)
MW-38D	DA	5/3/2016		LF	7.9	84	ND (2.5)	74	ND (0.05)
MW-38D	DA	12/7/2016		3V	8.2	84	ND (2.5)	48	0.09
MW-38D	DA	12/7/2016		LF	8.1	87	ND (2.5)	40	ND (0.05)
MW-38S	SA	2/24/2016		3V	14	43	ND (0.5)	230	ND (0.05)
MW-38S	SA	2/24/2016		LF	14	44	ND (0.5)	220	ND (0.05)
MW-38S	SA	5/3/2016		3V	11	41	ND (0.5)	210	0.17
MW-38S	SA	5/3/2016		LF	13	39	ND (0.5)	220	0.24
MW-38S	SA	9/29/2016		3V	9.8	44	ND (0.5)	170	0.78
MW-38S	SA	9/29/2016		LF	11	44	ND (0.5)	190	1
MW-38S	SA	12/7/2016		3V	9.6	47	ND (0.5)	130	1.4
MW-38S	SA	12/7/2016		LF	9.9	48	ND (0.5)	130	1.3
MW-38S	SA	12/7/2016	FD	3V	9.9	50	ND (0.5)	140	1.4
MW-39-040	SA	12/7/2016		LF	19	--	--	150	--
MW-39-050	MA	12/7/2016		LF	2.3	5.1	ND (0.5)	140	--
MW-39-060	MA	12/7/2016		LF	4.7	8.4	ND (0.5)	58	ND (0.05)
MW-39-070	MA	12/7/2016		LF	--	34	ND (0.5)	1.1	--
MW-39-080	DA	12/7/2016		LF	--	57	ND (0.5)	2.9	--
MW-39-100	DA	4/26/2016		LF	2.5	7.5	ND (0.5)	8.2	ND (0.05)
MW-39-100	DA	4/26/2016	FD	LF	2.6	8.1	ND (0.5)	8.2	ND (0.05)
MW-39-100	DA	12/7/2016		LF	2.3	6.9	ND (2.5)	9.1	ND (0.05)
MW-40D	DA	5/4/2016		H	4.4	49	1.5	12	1.1
MW-40D	DA	5/4/2016		LF	4.1	49	ND (2.5)	1.3	2.7
MW-41D	DA	4/27/2016		LF	1.9	87	ND (2.5)	89	0.28
MW-41D	DA	12/8/2016		LF	2.9	83	ND (2.5)	65	0.46
MW-41M	DA	12/8/2016		LF	2.2	27	ND (2.5)	1.6	0.67
MW-41S	SA	12/8/2016		LF	1.7	16	1	0.57	1.5
MW-42-030	SA	12/6/2016		LF	--	20	ND (0.5)	36	ND (0.05)
MW-42-055	MA	4/26/2016		LF	28	--	--	19	--
MW-42-055	MA	12/6/2016		LF	29	8.2	ND (0.5)	22	--
MW-42-065	MA	4/26/2016		LF	5.1	--	--	350	--
MW-42-065	MA	12/6/2016		LF	5.4	19	ND (0.5)	580	--

Table 3-2a

Groundwater COPCs and In Situ Byproducts Sampling Results, January 2016 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California

Location ID	Aquifer Zone	Sample Date		Sample Method	Arsenic Dissolved (µg/L)	Molybdenum Dissolved (µg/L)	Selenium Dissolved (µg/L)	Manganese Dissolved (µg/L)	Nitrate as N (mg/L)
MW-42-065	MA	12/6/2016	FD	LF	5.5	19	ND (0.5)	590	--
MW-43-025	SA	12/7/2016		LF	25	7.2	ND (0.5)	290	--
MW-43-075	DA	12/9/2016		LF	13	13	ND (2.5)	930	--
MW-43-090	DA	12/9/2016		LF	2.2	29	ND (2.5)	430	--
MW-44-070	MA	4/26/2016		LF	4.1	--	--	160	--
MW-44-070	MA	12/7/2016		LF	5.3	14	ND (0.5)	94	--
MW-44-115	DA	2/25/2016		LF	6.1	95	ND (2.5)	5.5	0.17
MW-44-115	DA	2/25/2016	FD	LF	5.5	91	ND (2.5)	5.3	0.2
MW-44-115	DA	4/26/2016		LF	6	90	ND (0.5)	5.9	0.14
MW-44-115	DA	10/6/2016		LF	--	--	--	--	0.1
MW-44-115	DA	10/6/2016	FD	LF	--	--	--	--	0.072
MW-44-115	DA	12/7/2016		LF	6.6	110	ND (2.5)	4.3	0.15
MW-44-125	DA	4/26/2016		LF	4	110	ND (0.5)	450	0.14
MW-44-125	DA	4/26/2016	FD	LF	4	120	ND (0.5)	460	0.12
MW-44-125	DA	12/7/2016		LF	5.1	170	ND (2.5)	310	0.066
MW-44-125	DA	12/7/2016	FD	LF	5	180	ND (2.5)	320	0.095
MW-46-175	DA	2/25/2016		LF	--	190	ND (2.5)	--	1.2
MW-46-175	DA	4/26/2016		LF	--	150	ND (2.5)	--	1.2
MW-46-175	DA	10/6/2016		LF	--	--	--	--	1.1
MW-46-175	DA	12/8/2016		LF	--	210	ND (2.5)	19	1.1
MW-46-205	DA	12/8/2016		LF	--	350	ND (2.5)	42	--
MW-47-055	SA	4/26/2016		3V	1.1	--	--	ND (0.5)	--
MW-47-055	SA	12/8/2016		LF	1.3	ND (12)	ND (2.5)	ND (0.5)	--
MW-47-115	DA	12/8/2016		LF	--	24	ND (12)	ND (2.5)	--
MW-48	BR	12/14/2016		G	--	11	ND (2.5)	14	--
MW-49-135	DA	12/8/2016		3V	2.2	41	ND (2.5)	270	--
MW-49-135	DA	12/8/2016	FD	3V	2	42	ND (2.5)	270	--
MW-49-275	DA	12/8/2016		LF	2.8	260	ND (2.5)	380	--
MW-49-365	DA	12/8/2016		LF	3.6	190	ND (12)	280	--
MW-50-095	MA	12/9/2016		LF	--	19	ND (2.5)	3.1	--
MW-50-200	DA	12/9/2016		LF	--	39	ND (12)	2.8	--
MW-51	MA	4/27/2016		LF	3.4	42	16	1.9	11
MW-51	MA	12/9/2016		LF	4	48	15	1.7	9.5
MW-52D	DA	4/25/2016		LF	2.3	--	--	280	--
MW-52D	DA	12/5/2016		LF	2.5	90	ND (2.5)	310	--
MW-52M	DA	4/25/2016		LF	0.92	--	--	150	--
MW-52M	DA	12/5/2016		LF	0.74	36	ND (2.5)	220	--
MW-52S	MA	4/25/2016		LF	0.38	--	--	1,400	--
MW-52S	MA	12/5/2016		LF	0.34	2.9	ND (2.5)	1,300	--
MW-52S	MA	12/5/2016	FD	LF	0.23	2.7	ND (0.5)	1,400	--
MW-53D	DA	4/27/2016		LF	2.9 J	--	--	1,500 J	--
MW-53D	DA	12/5/2016		LF	0.68	110	ND (2.5)	320	--
MW-53M	DA	4/27/2016		LF	ND (0.5)	--	--	400	--
MW-53M	DA	12/5/2016		LF	0.47	43	ND (2.5)	260	--
MW-54-085	DA	4/29/2016	(a)	LF	ND (5)	--	--	777	--
MW-54-085	DA	12/15/2016	(a)	3V	3.16	ND (2.5)	ND (0.3)	731	--
MW-54-140	DA	4/29/2016	(a)	LF	ND (5)	--	--	123	--
MW-54-140	DA	12/15/2016	(a)	3V	2.98	53	ND (1.5)	84.7	--
MW-54-195	DA	4/29/2016	(a)	LF	ND (5)	--	--	185 J	--
MW-54-195	DA	12/15/2016	(a)	LF	1.17	120	ND (1.5)	316	--
MW-54-195	DA	12/15/2016	FD(a)	LF	1.35	119	ND (1.5)	310	--
MW-55-045	MA	12/15/2016	(a)	LF	--	40.5	ND (0.3)	831	--
MW-55-120	DA	2/24/2016		LF	6.4	51	ND (12)	10	1.5
MW-55-120	DA	2/24/2016	(a)	LF	5.8	45	ND (5)	7.8	1.3 J
MW-55-120	DA	12/15/2016	(a)	3V	--	43.8	ND (0.3)	ND (0.2)	--
MW-56D	DA	12/14/2016	(a)	LF	--	ND (2.5)	ND (1.5)	748	--
MW-56M	DA	12/14/2016	(a)	LF	--	ND (2.5)	ND (1.5)	717	--
MW-56S	SA	12/14/2016	(a)	LF	--	28.7	ND (0.3)	1,030	--
MW-57-070	BR	4/28/2016		3V	1.4	4.9	3.2	3.9	7.3
MW-57-070	BR	12/13/2016		LF	1.5	3.7	3.2	ND (0.5)	7.7
MW-57-185	BR	4/28/2016		3V	10	94	ND (0.5)	240	0.085
MW-57-185	BR	12/13/2016		3V	17	88	ND (12)	290	ND (0.05)
MW-58BR	BR	2/24/2016		LF	1.5	27	ND (2.5)	390 J	0.16
MW-58BR	BR	4/28/2016		LF	1.4	29	1.1	430	0.081
MW-58BR	BR	4/28/2016	FD	LF	1.3	27	0.9	400	0.08

Table 3-2a

Groundwater COPCs and In Situ Byproducts Sampling Results, January 2016 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California

Location ID	Aquifer Zone	Sample Date		Sample Method	Arsenic Dissolved (µg/L)	Molybdenum Dissolved (µg/L)	Selenium Dissolved (µg/L)	Manganese Dissolved (µg/L)	Nitrate as N (mg/L)
MW-58BR	BR	9/27/2016		LF	1.6	23	ND (2.5)	380 J	0.42
MW-58BR	BR	12/13/2016		LF	1.6	26	ND (2.5)	390	0.34
MW-59-100	SA	4/29/2016		LF	2.2	8	2.5	ND (2.5)	2.9
MW-59-100	SA	12/7/2016		LF	2.3	5.3	4	10	3.4
MW-59-100	SA	12/7/2016	FD	LF	2.2	5.6	3.6	8.4	3.5
MW-60-125	BR	4/28/2016		3V	1.6	20	6.1	3	4.3
MW-60-125	BR	12/14/2016		LF	1.5	19	6.2	4.9	4.1
MW-60BR-245	BR	2/23/2016		3V	6.9	60	ND (12)	19	ND (0.05)
MW-60BR-245	BR	4/29/2016		G	6.8	62	2.6	17	0.13
MW-60BR-245	BR	9/29/2016		3V	7.7	64	ND (2.5)	14	0.14
MW-60BR-245	BR	12/14/2016		3V	7.1	60	3.1	15	0.15
MW-61-110	BR	4/29/2016		LF	3.3	24	ND (2.5)	150	0.65
MW-61-110	BR	12/13/2016		3V	3.4	22	ND (12)	150	0.9
MW-62-065	BR	2/23/2016		3V	1.2	14	4	2.5	4.6
MW-62-065	BR	5/2/2016		3V	1.5	14	3.9	0.91	4.3
MW-62-065	BR	9/28/2016		LF	1.8	18	3.1	5.5	3.6
MW-62-065	BR	12/13/2016		LF	1.4	12	4	1.1	4.6
MW-62-110	BR	2/24/2016		3V	4.9	77	ND (2.5)	81	0.1
MW-62-110	BR	5/3/2016		Tap	6.2	63	ND (2.5)	110	ND (0.05)
MW-62-110	BR	9/28/2016		Flute	5	54	ND (2.5)	120	ND (0.05)
MW-62-110	BR	12/14/2016		G	13	54	ND (2.5)	120	0.092
MW-62-190	BR	5/3/2016		Tap	4.7	43	ND (2.5)	1,100	0.064
MW-62-190	BR	12/14/2016		G	3.8	21	ND (2.5)	1,200	ND (0.05)
MW-63-065	BR	2/23/2016		3V	1.7	20	ND (2.5)	1.4	0.92
MW-63-065	BR	4/28/2016		3V	1.6	20	0.91	2.3	0.76
MW-63-065	BR	4/28/2016	FD	3V	1.5	19	0.86	2.2	0.85
MW-63-065	BR	9/30/2016		LF	1.5	--	0.85	3.7	0.96
MW-63-065	BR	9/30/2016	FD	LF	1.4	18	ND (2.5)	3.3	1.1
MW-63-065	BR	12/13/2016		LF	1.6	18	ND (2.5)	5.2	0.98
MW-64BR	BR	2/22/2016		LF	4.1	70	ND (2.5)	1,000	ND (0.05)
MW-64BR	BR	5/2/2016		LF	4.2	72	ND (0.5)	990	ND (0.05)
MW-64BR	BR	9/28/2016		LF	4	70	ND (2.5)	1,000	ND (0.05)
MW-64BR	BR	12/13/2016		LF	4.2	65	ND (2.5)	1,000	ND (0.05)
MW-64BR	BR	12/13/2016	FD	LF	4.7	65	ND (12)	1,000	ND (0.05)
MW-65-160	SA	2/24/2016		LF	0.54	34	7.2	8.8	11
MW-65-160	SA	5/3/2016		LF	0.54	36	6.5	7.1	11
MW-65-160	SA	9/29/2016		LF	0.54	37	7.4	12	11
MW-65-160	SA	12/6/2016		LF	0.8	31 J	9.7	15	12
MW-65-225	DA	2/24/2016		LF	2.2	36	4.9	28	6.8
MW-65-225	DA	5/3/2016		LF	2.8	52	ND (2.5)	49	2
MW-65-225	DA	9/29/2016		LF	4.1	62	ND (2.5)	460	1.8
MW-65-225	DA	12/6/2016		LF	3	58	ND (2.5)	43	2.1
MW-66-165	SA	4/25/2016		LF	1.1	5.4	32	ND (0.5)	33
MW-66-165	SA	12/5/2016		LF	0.96	8.5	18	ND (0.5)	23
MW-66-230	DA	4/25/2016		LF	4.3	80	18	3.6	23
MW-66-230	DA	12/5/2016		LF	4.7	93	18	5.4	25
MW-66BR-270	BR	5/4/2016		3V	ND (0.1)	3.1	ND (0.5)	520 J	ND (0.05)
MW-66BR-270	BR	12/15/2016		3V	0.15	4.8	ND (2.5)	93	0.1
MW-67-185	SA	5/3/2016		LF	1.1	8.9	340	ND (0.5)	67
MW-67-185	SA	12/5/2016		LF	0.96	10	340	ND (0.5)	77
MW-67-225	MA	5/3/2016		LF	3.6	44	86	11	26
MW-67-225	MA	5/3/2016	FD	LF	3.7	45	86	12	26
MW-67-225	MA	12/5/2016		LF	3.6	44	92	8.3	24
MW-67-260	DA	5/3/2016		LF	9.3	88	ND (2.5)	140	0.58
MW-67-260	DA	12/5/2016		LF	9 J	84	ND (2.5 J)	140 J	0.74
MW-67-260	DA	12/5/2016	FD	LF	20 J	96	10 J	230 J	0.69
MW-68-180	SA	2/24/2016		LF	2.7	58	16	ND (0.5)	31
MW-68-180	SA	5/4/2016		LF	2.8	38	11	ND (0.5)	13
MW-68-180	SA	9/29/2016		LF	3.1	48	15	6.6	23
MW-68-180	SA	12/6/2016		LF	3	52	21	ND (0.5)	32
MW-68-240	DA	5/4/2016		LF	1.5	23	3.5	37	4.5
MW-68-240	DA	12/6/2016		LF	1.8	26	ND (12)	35	4.7
MW-68BR-280	BR	5/4/2016		LF	0.82	35	ND (2.5)	300	ND (0.05)
MW-68BR-280	BR	12/6/2016		3V	1.2	45	ND (2.5)	130	ND (0.05)
MW-69-195	BR	2/24/2016		3V	2.4	92	12	2.2	20

Table 3-2a

Groundwater COPCs and In Situ Byproducts Sampling Results, January 2016 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California

Location ID	Aquifer Zone	Sample Date		Sample Method	Arsenic Dissolved (µg/L)	Molybdenum Dissolved (µg/L)	Selenium Dissolved (µg/L)	Manganese Dissolved (µg/L)	Nitrate as N (mg/L)
MW-69-195	BR	2/24/2016	FD	3V	2.3	94	12	2.1	19
MW-69-195	BR	4/25/2016		3V	2.3	80	13	ND (0.5)	21
MW-69-195	BR	9/29/2016		LF	2.5	98	10	1.3	18
MW-69-195	BR	12/6/2016		LF	2.7	110	12	1.1	16
MW-70-105	BR	4/28/2016		LF	4.8	91	4.9	37	3.9
MW-70-105	BR	12/14/2016		LF	4.1	79	4.7	13	4.5
MW-70BR-225	BR	4/28/2016		3V	2	19	2.5	1.2	3.6
MW-70BR-225	BR	12/14/2016		3V	2	20	2.8	4	3.8
MW-70BR-225	BR	12/14/2016	FD	3V	2.1	20	3	2.3	3.8
MW-71-035	SA	5/3/2016		LF	5.3	35	ND (2.5)	2,700	ND (0.05)
MW-71-035	SA	5/3/2016	FD	LF	5.7	36	ND (2.5)	3,000	ND (0.05)
MW-71-035	SA	12/14/2016		G	4.2	33	ND (2.5)	3,100	ND (0.05)
MW-72-080	BR	2/23/2016		3V	12	80	ND (2.5)	31	0.91
MW-72-080	BR	4/29/2016		3V	10	76	ND (2.5)	37	0.76
MW-72-080	BR	9/28/2016		LF	11	83	ND (2.5)	69	0.7
MW-72-080	BR	12/12/2016		LF	12	81	ND (2.5)	72	0.86
MW-72BR-200	BR	2/23/2016		3V	16	81	ND (2.5)	24	0.1
MW-72BR-200	BR	4/28/2016		3V	16	87	ND (0.5)	16	0.072
MW-72BR-200	BR	9/28/2016		3V	16	83	ND (2.5)	7.2	0.14
MW-72BR-200	BR	12/12/2016		3V	17	80	ND (2.5)	26	0.1
MW-73-080	BR	2/23/2016		3V	1.5	25	ND (12)	17	4.7
MW-73-080	BR	4/29/2016		3V	2.1	22	ND (2.5)	2.4	2.5
MW-73-080	BR	9/28/2016		G	2.3	24	3.1	37	2.9
MW-73-080	BR	12/12/2016		LF	1.6	33	4.4	48 J	2.8
MW-73-080	BR	12/12/2016	FD	LF	1.7	38	4.4	89 J	2.7
MW-74-240	BR	4/27/2016		LF	11	37	1.2	4.3	0.37
MW-74-240	BR	12/8/2016		LF	9.6	29	2.8	3.9	2.6
OW-03D	DA	12/8/2016		LF	--	21	ND (2.5)	1.7	--
OW-03M	MA	12/8/2016		LF	--	16	ND (2.5)	1.5	--
OW-03S	SA	12/8/2016		3V	--	6.6	5.7	ND (0.5)	--
PE-01	DA	1/6/2016		Tap	--	--	--	75	ND (0.05)
PE-01	DA	2/2/2016		Tap	--	--	--	72	ND (0.05)
PE-01	DA	3/2/2016		Tap	--	--	--	100	ND (0.05)
PE-01	DA	4/27/2016		Tap	--	--	--	93	ND (0.05)
PE-01	DA	5/10/2016		Tap	--	--	--	300	ND (0.05)
PE-01	DA	6/7/2016		Tap	--	--	--	72	ND (0.05)
PE-01	DA	7/6/2016		Tap	--	--	--	210	ND (0.05)
PE-01	DA	8/3/2016		Tap	--	--	--	160	ND (0.05)
PE-01	DA	9/8/2016		Tap	--	--	--	120	ND (0.05)
PE-01	DA	10/6/2016		Tap	--	--	--	--	ND (0.05)
PE-01	DA	10/6/2016	FD	Tap	--	--	--	--	ND (0.05)
PE-01	DA	11/2/2016		Tap	--	--	--	97	ND (0.05)
PE-01	DA	12/6/2016		Tap	--	--	--	100	0.061
PGE-07BR	BR	12/7/2016		3V	--	ND (12)	ND (2.5)	5,600	--
PGE-08	BR	12/7/2016		3V	--	110	ND (2.5)	580	ND (0.05)
PM-03	--	4/5/2016		Tap	1.2	5.9	1.4	ND (0.5)	3.1
PM-03	--	12/9/2016		Tap	--	5.8	1.7	ND (0.5)	--
PM-04	--	4/5/2016		Tap	0.43	6.4	1.1	1.2	2.1
PM-04	--	12/9/2016		Tap	--	5.4	1.1	8.8	--
PM-04	--	12/9/2016	FD	Tap	--	5.8	1.3	9.2	--
TW-01	SA	5/3/2016		Tap	--	15	13	--	18
TW-02D	DA	5/10/2016		Tap	--	--	--	56	0.84
TW-02D	DA	7/6/2016		Tap	--	--	--	52	1.4
TW-02D	DA	12/13/2016		Tap	--	13	ND (2.5)	130	--
TW-02S	SA	12/13/2016		Tap	--	15	ND (2.5)	36	1.3
TW-03D	DA	1/6/2016		Tap	--	--	--	13	3.3
TW-03D	DA	2/2/2016		Tap	--	--	--	12	3.2
TW-03D	DA	3/2/2016		Tap	--	--	--	9	3.7
TW-03D	DA	4/27/2016		Tap	--	--	--	17	2.9
TW-03D	DA	5/10/2016		Tap	--	--	--	12	3.1
TW-03D	DA	6/7/2016		Tap	--	--	--	12	2.9
TW-03D	DA	7/6/2016		Tap	--	--	--	12	2.9
TW-03D	DA	8/3/2016		Tap	--	--	--	11	3.1
TW-03D	DA	9/8/2016		Tap	--	--	--	10	2.7
TW-03D	DA	10/6/2016		Tap	--	--	--	--	2.9

Table 3-2a

Groundwater COPCs and In Situ Byproducts Sampling Results, January 2016 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California

Location ID	Aquifer Zone	Sample Date		Sample Method	Arsenic Dissolved (µg/L)	Molybdenum Dissolved (µg/L)	Selenium Dissolved (µg/L)	Manganese Dissolved (µg/L)	Nitrate as N (mg/L)
TW-03D	DA	11/2/2016		Tap	--	--	--	10	3.2
TW-03D	DA	11/2/2016	FD	Tap	--	--	--	10	2.9
TW-03D	DA	12/6/2016		Tap	--	--	--	10	3.3

Notes:

(a) = data were analyzed by an Arizona certified laboratory.
--- = data were either not collected, not available or were rejected
COPC = contaminants of potential concern.
FD = field duplicate sample.
J = concentration or reporting limit estimated by laboratory or data validation.
mg/L = milligrams per liter.
ND = not detected at listed reporting limit.
ug/L = micrograms per liter.
USEPA = United States Environmental Protection Agency

Sample Methods:
3V = three volume.
Flute = flexible liner underground technologies sampling system.
LF = Low Flow (minimal drawdown)
Slant = slant (non vertical) wells MW-52, MW-53, MW-56 are sampled from dedicated Barcad screens, using a peristaltic pump.
Tap = sampled from tap or port of extraction or supply well.

Wells are assigned to separate aquifer zones for results reporting:
SA = shallow interval of Alluvial Aquifer.
MA = mid-depth interval of Alluvial Aquifer.
DA = deep interval of Alluvial Aquifer.
PA = perched aquifer (unsaturated zone).
BR = well completed in bedrock (Miocene Conglomerate or pre-Tertiary crystalline rock).

Nitrate samples were analyzed using USEPA Method 4500NO3, except for TW-3D and PE-1, which were analyzed using USEPA Method 300.0. USEPA Method 4500NO3 reports a combination of nitrate and nitrite as nitrogen. The contribution of nitrite to the reported result of nitrate plus nitrite as nitrogen is expected to be negligible; therefore, sample results for USEPA Method 4500NO3 are expected to be essentially the same as previous samples analyzed using USEPA Method 300.0 and reported as nitrate as nitrogen.

Starting in Third Quarter 2014, the groundwater sample collection method was switched from the traditional three-volume purge method (3V) to the low flow (LF) method at many short screen wells screened in alluvial sediments. The method for purging prior to sample collection is indicated in the sample method column of this table.

The background study upper tolerance limit (UTL) for arsenic is 24.3 µg/L.
The USEPA and California maximum contaminant level (MCL) for arsenic is 10 µg/L.
The background study UTL for molybdenum is 36.3 µg/L.
There is no USEPA or California MCL for molybdenum.
The background study UTL for selenium is 10.3 µg/L.
The USEPA and California MCL for selenium is 50.0 µg/L.
The secondary USEPA and California MCL for manganese is 50 ug/L.
The background study UTL for nitrate as nitrogen is 5.03 mg/L.
The USEPA and California MCL for nitrate as nitrogen is 10 mg/L.
The background study UTL for fluoride is 7.1 mg/L.
The USEPA MCL for fluoride is 4 mg/L, and the California MCL for fluoride is 2 mg/L.

Table 3-2b

Groundwater COPCs and In Situ Byproducts Sampling Results, Fourth Quarter 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

Location ID	Aquifer Zone	Sample Date		Sample Method	Arsenic Dissolved (µg/L)	Molybdenum Dissolved (µg/L)	Selenium Dissolved (µg/L)	Manganese Dissolved (µg/L)	Nitrate as N (mg/L)
MW-09	SA	12/7/2016		LF	1.8	3.3	5.5	ND (0.5)	12
MW-10	SA	12/7/2016		LF	3	23	6.9	3.4	12
MW-11	SA	12/7/2016		LF	1.5	6.4	5.4	ND (0.5)	5.6
MW-11	SA	12/7/2016	FD	LF	1.4	6	5.1	ND (0.5)	5.6
MW-12	SA	12/7/2016		3V	41	12	24	1.4	16
MW-13	SA	12/8/2016		LF	1.4	11	2.7	ND (0.5)	--
MW-14	SA	12/8/2016		LF	0.91	14	2.5	ND (0.5)	3.3
MW-15	SA	12/12/2016		LF	--	18	4.3	ND (0.5)	--
MW-18	SA	12/8/2016		LF	--	6.6	4.1	ND (0.5)	--
MW-19	SA	12/8/2016		LF	0.96	5.4	3.3	ND (0.5)	--
MW-20-070	SA	12/9/2016		LF	--	40	5.5	ND (0.5)	8
MW-20-100	MA	12/9/2016		LF	--	4.2	5.8	ND (0.5)	8.1
MW-20-130	DA	12/9/2016		LF	5.2	68	22	ND (2.5)	12
MW-20-130	DA	12/9/2016	FD	LF	5.3	75	21	2.2	11
MW-21	SA	12/14/2016		LF	--	120	31	33	0.31
MW-22	SA	12/6/2016		LF	16	39	ND (2.5)	4,500	--
MW-23-060	BR	12/14/2016		LF	5.7	23	5.3	3.7	--
MW-23-080	BR	12/14/2016		LF	5.1	43	5.6	4.4	--
MW-23-080	BR	12/14/2016	FD	LF	4.9	41	5.7	4.2	--
MW-24A	SA	12/6/2016		LF	0.13	130	ND (0.5)	22	ND (0.05)
MW-24B	DA	12/6/2016		LF	1.4	63	ND (2.5)	85	1.1
MW-24BR	BR	12/7/2016		3V	ND (0.5)	65	ND (2.5)	130	ND (0.05)
MW-25	SA	12/8/2016		LF	1.4	5.1	7.5	ND (0.5)	9.3
MW-26	SA	12/8/2016		LF	1.9	29	45	ND (0.5)	22
MW-26	SA	12/8/2016	FD	LF	1.8	31	43	ND (0.5)	21
MW-27-020	SA	12/6/2016		LF	1.3	6.3	ND (0.5)	63	ND (0.05)
MW-27-060	MA	12/6/2016		LF	8.3	4.4	ND (0.5)	220	ND (0.05)
MW-27-060	MA	12/6/2016	FD	LF	8	4.1	ND (0.5)	210	ND (0.05)
MW-27-085	DA	12/6/2016		LF	1.5	21	ND (2.5)	69	ND (0.05)
MW-28-025	SA	12/8/2016		LF	0.84	5.6	ND (0.5)	ND (0.5)	ND (0.05)
MW-28-090	DA	12/8/2016		LF	2.5	27	ND (0.5)	290	ND (0.05)
MW-29	SA	12/8/2016		LF	12	12	ND (0.5)	390	ND (0.05)
MW-30-030	SA	12/6/2016		LF	2.7	97	ND (2.5)	230	ND (0.1)
MW-30-050	MA	12/6/2016		LF	2.9	4.6	ND (0.5)	200	ND (0.05)
MW-31-060	SA	12/9/2016		LF	1.2	15	3.2	ND (0.5)	4.1
MW-31-060	SA	12/9/2016	FD	LF	1.2	16	2.9	ND (0.5)	4.1
MW-31-135	DA	12/9/2016		LF	3.9	26	ND (2.5)	1.8	--
MW-32-020	SA	12/6/2016		LF	4.9	390	ND (12)	280	--
MW-32-035	SA	12/6/2016		LF	13	12	ND (2.5)	840	ND (0.05)
MW-33-040	SA	12/8/2016		LF	11	450	ND (2.5)	ND (0.5)	0.47
MW-33-090	MA	12/8/2016		LF	1.2	ND (12)	ND (2.5)	3.3	1.1
MW-33-150	DA	12/8/2016		LF	1.8	45	ND (2.5)	ND (2.5)	1.4
MW-33-210	DA	12/8/2016		3V	1.2	18	ND (2.5)	5.6	1.8
MW-34-055	MA	12/6/2016		LF	2.4	5	ND (0.5)	86	ND (0.05)
MW-34-080	DA	12/6/2016		LF	1.3	14	ND (2.5)	33	--
MW-34-080	DA	12/6/2016	FD	LF	1.3	14	ND (2.5)	33	--
MW-34-100	DA	12/6/2016		LF	1.2	51	ND (2.5)	36	0.078
MW-35-060	SA	12/9/2016		LF	1.1	9	ND (2.5)	ND (0.5)	2
MW-35-135	DA	12/9/2016		LF	0.95	25	ND (2.5)	0.62	2.5
MW-35-135	DA	12/9/2016	FD	LF	0.91	25	ND (2.5)	0.6	2.6
MW-36-020	SA	12/7/2016		LF	1.9	37	ND (2.5)	390	--
MW-36-040	SA	12/7/2016		LF	5.6	6.1	ND (0.5)	110	ND (0.05)
MW-36-050	MA	12/7/2016		LF	4.4	3.8	ND (0.5)	250	--
MW-36-070	MA	12/7/2016		LF	3.2	4.9	ND (0.5)	240	--
MW-36-090	DA	12/7/2016		LF	18	8.2	ND (0.5)	25	--
MW-36-100	DA	12/7/2016		LF	6.6	28	ND (2.5)	110	0.06
MW-37D	DA	12/8/2016		LF	4.4	58	ND (2.5)	4.8	0.16
MW-37S	MA	12/8/2016		LF	1.9	16	0.8	2.1	--
MW-38D	DA	12/7/2016		3V	8.2	84	ND (2.5)	48	0.09
MW-38D	DA	12/7/2016		LF	8.1	87	ND (2.5)	40	ND (0.05)
MW-38S	SA	12/7/2016		3V	9.6	47	ND (0.5)	130	1.4
MW-38S	SA	12/7/2016		LF	9.9	48	ND (0.5)	130	1.3
MW-38S	SA	12/7/2016	FD	3V	9.9	50	ND (0.5)	140	1.4
MW-39-040	SA	12/7/2016		LF	19	--	--	150	--
MW-39-050	MA	12/7/2016		LF	2.3	5.1	ND (0.5)	140	--

Table 3-2b

Groundwater COPCs and In Situ Byproducts Sampling Results, Fourth Quarter 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California

Location ID	Aquifer Zone	Sample Date		Sample Method	Arsenic Dissolved (µg/L)	Molybdenum Dissolved (µg/L)	Selenium Dissolved (µg/L)	Manganese Dissolved (µg/L)	Nitrate as N (mg/L)
MW-39-060	MA	12/7/2016		LF	4.7	8.4	ND (0.5)	58	ND (0.05)
MW-39-070	MA	12/7/2016		LF	--	34	ND (0.5)	1.1	--
MW-39-080	DA	12/7/2016		LF	--	57	ND (0.5)	2.9	--
MW-39-100	DA	12/7/2016		LF	2.3	6.9	ND (2.5)	9.1	ND (0.05)
MW-41D	DA	12/8/2016		LF	2.9	83	ND (2.5)	65	0.46
MW-41M	DA	12/8/2016		LF	2.2	27	ND (2.5)	1.6	0.67
MW-41S	SA	12/8/2016		LF	1.7	16	1	0.57	1.5
MW-42-030	SA	12/6/2016		LF	--	20	ND (0.5)	36	ND (0.05)
MW-42-055	MA	12/6/2016		LF	29	8.2	ND (0.5)	22	--
MW-42-065	MA	12/6/2016		LF	5.4	19	ND (0.5)	580	--
MW-42-065	MA	12/6/2016	FD	LF	5.5	19	ND (0.5)	590	--
MW-43-025	SA	12/7/2016		LF	25	7.2	ND (0.5)	290	--
MW-43-075	DA	12/9/2016		LF	13	13	ND (2.5)	930	--
MW-43-090	DA	12/9/2016		LF	2.2	29	ND (2.5)	430	--
MW-44-070	MA	12/7/2016		LF	5.3	14	ND (0.5)	94	--
MW-44-115	DA	12/7/2016		LF	6.6	110	ND (2.5)	4.3	0.15
MW-44-125	DA	12/7/2016		LF	5.1	170	ND (2.5)	310	0.066
MW-44-125	DA	12/7/2016	FD	LF	5	180	ND (2.5)	320	0.095
MW-46-175	DA	12/8/2016		LF	--	210	ND (2.5)	19	1.1
MW-46-205	DA	12/8/2016		LF	--	350	ND (2.5)	42	--
MW-47-055	SA	12/8/2016		LF	1.3	ND (12)	ND (2.5)	ND (0.5)	--
MW-47-115	DA	12/8/2016		LF	--	24	ND (12)	ND (2.5)	--
MW-48	BR	12/14/2016		G	--	11	ND (2.5)	14	--
MW-49-135	DA	12/8/2016		3V	2.2	41	ND (2.5)	270	--
MW-49-135	DA	12/8/2016	FD	3V	2	42	ND (2.5)	270	--
MW-49-275	DA	12/8/2016		LF	2.8	260	ND (2.5)	380	--
MW-49-365	DA	12/8/2016		LF	3.6	190	ND (12)	280	--
MW-50-095	MA	12/9/2016		LF	--	19	ND (2.5)	3.1	--
MW-50-200	DA	12/9/2016		LF	--	39	ND (12)	2.8	--
MW-51	MA	12/9/2016		LF	4	48	15	1.7	9.5
MW-52D	DA	12/5/2016		LF	2.5	90	ND (2.5)	310	--
MW-52M	DA	12/5/2016		LF	0.74	36	ND (2.5)	220	--
MW-52S	MA	12/5/2016		LF	0.34	2.9	ND (2.5)	1,300	--
MW-52S	MA	12/5/2016	FD	LF	0.23	2.7	ND (0.5)	1,400	--
MW-53D	DA	12/5/2016		LF	0.68	110	ND (2.5)	320	--
MW-53M	DA	12/5/2016		LF	0.47	43	ND (2.5)	260	--
MW-54-085	DA	12/15/2016	(a)	3V	3.16	ND (2.5)	ND (0.3)	731	--
MW-54-140	DA	12/15/2016	(a)	3V	2.98	53	ND (1.5)	84.7	--
MW-54-195	DA	12/15/2016	(a)	LF	1.17	120	ND (1.5)	316	--
MW-54-195	DA	12/15/2016	FD(a)	LF	1.35	119	ND (1.5)	310	--
MW-55-045	MA	12/15/2016	(a)	LF	--	40.5	ND (0.3)	831	--
MW-55-120	DA	12/15/2016	(a)	3V	--	43.8	ND (0.3)	ND (0.2)	--
MW-56D	DA	12/14/2016	(a)	LF	--	ND (2.5)	ND (1.5)	748	--
MW-56M	DA	12/14/2016	(a)	LF	--	ND (2.5)	ND (1.5)	717	--
MW-56S	SA	12/14/2016	(a)	LF	--	28.7	ND (0.3)	1,030	--
MW-57-070	BR	12/13/2016		LF	1.5	3.7	3.2	ND (0.5)	7.7
MW-57-185	BR	12/13/2016		3V	17	88	ND (12)	290	ND (0.05)
MW-58BR	BR	12/13/2016		LF	1.6	26	ND (2.5)	390	0.34
MW-59-100	SA	12/7/2016		LF	2.3	5.3	4	10	3.4
MW-59-100	SA	12/7/2016	FD	LF	2.2	5.6	3.6	8.4	3.5
MW-60-125	BR	12/14/2016		LF	1.5	19	6.2	4.9	4.1
MW-60BR-245	BR	12/14/2016		3V	7.1	60	3.1	15	0.15
MW-61-110	BR	12/13/2016		3V	3.4	22	ND (12)	150	0.9
MW-62-065	BR	12/13/2016		LF	1.4	12	4	1.1	4.6
MW-62-110	BR	12/14/2016		G	13	54	ND (2.5)	120	0.092
MW-62-190	BR	12/14/2016		G	3.8	21	ND (2.5)	1,200	ND (0.05)
MW-63-065	BR	12/13/2016		LF	1.6	18	ND (2.5)	5.2	0.98
MW-64BR	BR	12/13/2016		LF	4.2	65	ND (2.5)	1,000	ND (0.05)
MW-64BR	BR	12/13/2016	FD	LF	4.7	65	ND (12)	1,000	ND (0.05)
MW-65-160	SA	12/6/2016		LF	0.8	31 J	9.7	15	12
MW-65-225	DA	12/6/2016		LF	3	58	ND (2.5)	43	2.1
MW-66-165	SA	12/5/2016		LF	0.96	8.5	18	ND (0.5)	23
MW-66-230	DA	12/5/2016		LF	4.7	93	18	5.4	25
MW-66BR-270	BR	12/15/2016		3V	0.15	4.8	ND (2.5)	93	0.1
MW-67-185	SA	12/5/2016		LF	0.96	10	340	ND (0.5)	77

Table 3-2b

Groundwater COPCs and In Situ Byproducts Sampling Results, Fourth Quarter 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

Location ID	Aquifer Zone	Sample Date		Sample Method	Arsenic Dissolved (µg/L)	Molybdenum Dissolved (µg/L)	Selenium Dissolved (µg/L)	Manganese Dissolved (µg/L)	Nitrate as N (mg/L)
MW-67-225	MA	12/5/2016		LF	3.6	44	92	8.3	24
MW-67-260	DA	12/5/2016		LF	9 J	84	ND (2.5 J)	140 J	0.74
MW-67-260	DA	12/5/2016	FD	LF	20 J	96	10 J	230 J	0.69
MW-68-180	SA	12/6/2016		LF	3	52	21	ND (0.5)	32
MW-68-240	DA	12/6/2016		LF	1.8	26	ND (12)	35	4.7
MW-68BR-280	BR	12/6/2016		3V	1.2	45	ND (2.5)	130	ND (0.05)
MW-69-195	BR	12/6/2016		LF	2.7	110	12	1.1	16
MW-70-105	BR	12/14/2016		LF	4.1	79	4.7	13	4.5
MW-70BR-225	BR	12/14/2016		3V	2	20	2.8	4	3.8
MW-70BR-225	BR	12/14/2016	FD	3V	2.1	20	3	2.3	3.8
MW-71-035	SA	12/14/2016		G	4.2	33	ND (2.5)	3,100	ND (0.05)
MW-72-080	BR	12/12/2016		LF	12	81	ND (2.5)	72	0.86
MW-72BR-200	BR	12/12/2016		3V	17	80	ND (2.5)	26	0.1
MW-73-080	BR	12/12/2016		LF	1.6	33	4.4	48 J	2.8
MW-73-080	BR	12/12/2016	FD	LF	1.7	38	4.4	89 J	2.7
MW-74-240	BR	12/8/2016		LF	9.6	29	2.8	3.9	2.6
OW-03D	DA	12/8/2016		LF	--	21	ND (2.5)	1.7	--
OW-03M	MA	12/8/2016		LF	--	16	ND (2.5)	1.5	--
OW-03S	SA	12/8/2016		3V	--	6.6	5.7	ND (0.5)	--
PE-01	DA	11/2/2016		Tap	--	--	--	97	ND (0.05)
PE-01	DA	12/6/2016		Tap	--	--	--	100	0.061
PGE-07BR	BR	12/7/2016		3V	--	ND (12)	ND (2.5)	5,600	--
PGE-08	BR	12/7/2016		3V	--	110	ND (2.5)	580	ND (0.05)
PM-03	--	12/9/2016		Tap	--	5.8	1.7	ND (0.5)	--
PM-04	--	12/9/2016		Tap	--	5.4	1.1	8.8	--
PM-04	--	12/9/2016	FD	Tap	--	5.8	1.3	9.2	--
TW-02D	DA	12/13/2016		Tap	--	13	ND (2.5)	130	--
TW-02S	SA	12/13/2016		Tap	--	15	ND (2.5)	36	1.3
TW-03D	DA	11/2/2016		Tap	--	--	--	10	3.2
TW-03D	DA	11/2/2016	FD	Tap	--	--	--	10	2.9
TW-03D	DA	12/6/2016		Tap	--	--	--	10	3.3

Notes:
(a) = data were analyzed by an Arizona certified laboratory.
--- = data were either not collected, not available or were rejected
COPC = contaminants of potential concern.
FD = field duplicate sample.
J = concentration or reporting limit estimated by laboratory or data validation.
mg/L = milligrams per liter.
ND = not detected at listed reporting limit.
ug/L = micrograms per liter.
USEPA = United States Environmental Protection Agency

Sample Methods:
3V = three volume.
Flute = flexible liner underground technologies sampling system.
G = Grab sample.
LF = Low Flow (minimal drawdown)
Slant = slant (non vertical) wells MW-52, MW-53, MW-56 are sampled from dedicated Barcad screens, using a peristaltic pump.
Tap = sampled from tap or port of extraction or supply well.

Wells are assigned to separate aquifer zones for results reporting:
SA = shallow interval of Alluvial Aquifer.
MA = mid-depth interval of Alluvial Aquifer.
DA = deep interval of Alluvial Aquifer.
PA = perched aquifer (unsaturated zone).
BR = well completed in bedrock (Miocene Conglomerate or pre-Tertiary crystalline rock).

Nitrate samples were analyzed using USEPA Method 4500NO3, except for TW-3D and PE-1, which were analyzed using USEPA Method 300.0. USEPA Method 4500NO3 reports a combination of nitrate and nitrite as nitrogen. The contribution of nitrite to the reported result of nitrate plus nitrite as nitrogen is expected to be negligible; therefore, sample results for USEPA Method 4500NO3 are expected to be essentially the same as previous samples analyzed using USEPA Method 300.0 and reported as nitrate as nitrogen.

Starting in Third Quarter 2014, the groundwater sample collection method was switched from the traditional three-volume

Location ID	Aquifer Zone	Sample Date	Sample Method	Arsenic Dissolved (µg/L)	Molybdenum Dissolved (µg/L)	Selenium Dissolved (µg/L)	Manganese Dissolved (µg/L)	Nitrate as N (mg/L)

purge method (3V) to the low flow (LF) method at many short screen wells screened in alluvial sediments. The method for purging prior to sample collection is indicated in the sample method column of this table.

The background study upper tolerance limit (UTL) for arsenic is 24.3 µg/L.
The USEPA and California maximum contaminant level (MCL) for arsenic is 10 µg/L.
The background study UTL for molybdenum is 36.3 µg/L.
There is no USEPA or California MCL for molybdenum.
The background study UTL for selenium is 10.3 µg/L.
The USEPA and California MCL for selenium is 50.0 µg/L.
The secondary USEPA and California MCL for manganese is 50 ug/L.
The background study UTL for nitrate as nitrogen is 5.03 mg/L.
The USEPA and California MCL for nitrate as nitrogen is 10 mg/L.
The background study UTL for fluoride is 7.1 mg/L.
The USEPA MCL for fluoride is 4 mg/L, and the California MCL for fluoride is 2 mg/L.

Table 3-3

Title 22 Metals Results, January 2016 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

Location ID	California MCL: Sample Date	8 Antimony (µg/L)	10 Arsenic (µg/L)	1,000 Barium (µg/L)	4 Beryllium (µg/L)	5 Cadmium (µg/L)	NE Cobalt (µg/L)	50 Chromium (µg/L)	1,000* Copper (µg/L)	15 Lead (µg/L)	2 Mercury (µg/L)	NE Molybdenum (µg/L)	100 Nickel (µg/L)	50 Selenium (µg/L)	100* Silver (µg/L)	2 Thallium (µg/L)	NE Vanadium (µg/L)	5,000 Zinc (µg/L)
MW-10	5/3/2016	--	--	--	--	--	--	220	--	--	25	--	4.8	--	--	--	--	--
MW-10	12/7/2016	ND (0.5)	3	50	ND (0.5)	--	ND (0.5)	200	ND (1)	ND (1)	23	3.7	6.9	ND (0.5)	ND (0.5)	17	ND (10)	--
MW-12	5/2/2016	--	--	--	--	--	--	2,000	--	--	11	--	24	--	--	--	--	--
MW-12	12/7/2016	ND (0.5)	41	45	ND (2.5)	--	ND (0.5)	2,000	ND (1)	ND (5)	12	ND (1)	24	ND (2.5)	ND (2.5)	17	ND (10)	--
MW-22	4/25/2016	--	13	--	--	--	--	ND (1)	--	--	--	--	--	--	--	--	--	--
MW-22	12/6/2016	ND (2.5)	16	110	ND (12)	--	ND (2.5)	ND (5)	ND (5)	ND (25)	39	ND (5)	ND (2.5)	ND (12)	ND (12)	ND (5)	ND (50)	--
MW-26	4/28/2016	--	2	--	--	--	--	2,700	--	--	35	--	50	--	--	--	--	--
MW-26	12/8/2016 FD	ND (2.5)	1.8	33	ND (2.5)	ND (2.5)	ND (0.5)	2,100	ND (5)	ND (5)	31	ND (5)	43	ND (2.5)	ND (2.5)	7.9	ND (50)	--
MW-26	12/8/2016	ND (0.5)	1.9	32	ND (2.5)	ND (2.5)	ND (0.5)	2,500	ND (5)	ND (5)	29	ND (5)	45	ND (2.5)	ND (2.5)	7.4	ND (50)	--
MW-44-115	2/25/2016 FD	--	5.5	--	--	--	--	27	--	--	91	--	ND (2.5)	--	--	--	--	--
MW-44-115	2/25/2016	--	6.1	--	--	--	--	28	--	--	95	--	ND (2.5)	--	--	--	--	--
MW-44-115	4/26/2016	--	6	--	--	--	--	23	--	--	90	--	ND (0.5)	--	--	--	--	--
MW-44-115	10/6/2016 FD	--	--	--	--	--	--	18	--	--	--	--	--	--	--	--	--	--
MW-44-115	10/6/2016	--	--	--	--	--	--	18	--	--	--	--	--	--	--	--	--	--
MW-44-115	12/7/2016	--	6.6	--	--	--	--	24	--	--	110	--	ND (2.5)	--	--	--	--	--
MW-50-200	4/27/2016	--	--	--	--	--	--	7,600	--	--	--	--	--	--	--	--	--	--
MW-50-200	12/9/2016	--	--	--	--	--	--	5,900	--	--	39	--	ND (12)	--	--	--	--	--
MW-51	4/27/2016	--	3.4	--	--	--	--	5,000	--	--	42	--	16	--	--	--	--	--
MW-51	12/9/2016	--	4	--	--	--	--	4,100	--	--	48	--	15	--	--	--	--	--

Notes:
* = Secondary USEPA MCL
--- = data were either not collected, not available or were rejected
FD = Field duplicate sample
J = concentration or reporting limit estimated by laboratory or data validation.
MCL = Maximum contaminant levels.
ND = not detected at listed reporting limit.
NE = Not Established
µg/L = micrograms per liter.
USEPA = United States Environmental Protection Agency

Title 22 metals are the metals listed in California Code of Regulations, Title 22, Section 66261.24(a)(2)(A).

The MCLs listed, in micrograms per liter (ug/L), are the California primary drinking water standards, except where noted.
All results are dissolved metals concentrations in µg/L from field-filtered samples.
Metals analyzed by USEPA Methods SW6020A or SW7470A.

Table 3-4

Surface Water Sampling Results, January 2016 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

Location ID	Sample Date		Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)	Specific Conductance (µS/cm)	Lab pH*
In-channel Locations						
C-BNS-D	1/26/2016		ND (0.2)	ND (1)	1,010	8.2
C-BNS-D	2/23/2016		ND (0.2)	ND (1)	1,080	8.2
C-BNS-D	4/27/2016		ND (0.2)	ND (1)	993	8.2
C-BNS-D	4/27/2016	FD	ND (0.2)	ND (1)	--	8.2
C-BNS-D	7/6/2016		ND (0.2)	ND (1)	836	8.3
C-BNS-D	11/29/2016		ND (0.2)	ND (1)	1,010	8.1
C-CON-D	1/27/2016		ND (0.2)	ND (1)	1,000	8.0
C-CON-D	2/24/2016		ND (0.2)	ND (1)	1,090	8.1
C-CON-D	4/28/2016		ND (0.2)	ND (1)	1,090	8.2
C-CON-D	7/7/2016		ND (0.2)	ND (1)	--	8.2
C-CON-D	11/30/2016		ND (0.2)	ND (1)	1,020	8.3
C-CON-S	1/27/2016		ND (0.2)	ND (1)	1,000	8.1
C-CON-S	2/24/2016		ND (0.2)	ND (1)	1,090	8.2
C-CON-S	4/28/2016		ND (0.2)	ND (1)	1,090	8.2
C-CON-S	7/7/2016		ND (0.2)	ND (1)	--	8.3
C-CON-S	11/30/2016		ND (0.2)	ND (1)	1,020	8.3
C-I-3-D	1/26/2016		ND (0.2)	ND (1)	1,010	8.3
C-I-3-D	2/23/2016		ND (0.2)	ND (1)	1,070	8.2
C-I-3-D	4/27/2016		ND (0.2)	ND (1)	988	8.2
C-I-3-D	7/6/2016		ND (0.2)	ND (1)	833	8.3
C-I-3-D	11/29/2016		ND (0.2)	ND (1)	1,010	8.2
C-I-3-S	1/26/2016		ND (0.2)	ND (1)	1,010	8.3
C-I-3-S	2/23/2016		ND (0.2)	ND (1)	1,080	8.2
C-I-3-S	4/27/2016		ND (0.2)	ND (1)	988	8.2
C-I-3-S	7/6/2016		ND (0.2)	ND (1)	833	8.3
C-I-3-S	11/29/2016		ND (0.2)	ND (1)	1,020	8.2
C-I-3-S	11/29/2016	FD	ND (0.2)	ND (1)	--	8.2
C-MAR-D	1/27/2016		ND (0.2)	ND (1)	1,020	8.0
C-MAR-D	2/23/2016		ND (0.2)	ND (1)	1,200	7.8
C-MAR-D	4/27/2016		ND (0.2)	ND (1)	1,070	7.7
C-MAR-D	7/6/2016		ND (0.2)	ND (1)	903	7.9
C-MAR-D	11/30/2016		ND (0.2)	ND (1)	1,160	8.0
C-MAR-S	1/27/2016		ND (0.2)	ND (1)	1,020	8.0
C-MAR-S	2/23/2016		ND (0.2)	ND (1)	1,220	7.8
C-MAR-S	4/27/2016		ND (0.2)	ND (1)	1,070	7.7
C-MAR-S	7/6/2016		ND (0.2)	ND (1)	912	8.1
C-MAR-S	11/30/2016		ND (0.2)	ND (1)	1,170	8.0
C-NR1-D	1/27/2016		ND (0.2)	ND (1)	1,000	8.1
C-NR1-D	2/24/2016		ND (0.2)	ND (1)	1,090	8.2
C-NR1-D	4/28/2016		ND (0.2)	ND (1)	1,090	8.2
C-NR1-D	7/7/2016		ND (0.2)	ND (1)	--	8.3
C-NR1-D	11/30/2016		ND (0.2)	ND (1)	1,010	8.3
C-NR1-S	1/27/2016		ND (0.2)	ND (1)	1,010	8.2
C-NR1-S	1/27/2016	FD	ND (0.2)	ND (1)	--	8.2
C-NR1-S	2/24/2016		ND (0.2)	ND (1)	1,100	8.2
C-NR1-S	4/28/2016		ND (0.2)	ND (1)	1,090	8.2
C-NR1-S	7/7/2016		ND (0.2)	ND (1)	--	8.3

Table 3-4

Surface Water Sampling Results, January 2016 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

Location ID	Sample Date		Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)	Specific Conductance (µS/cm)	Lab pH*
C-NR1-S	11/30/2016		ND (0.2)	ND (1)	1,010	8.3
C-NR1-S	11/30/2016	FD	ND (0.2)	ND (1)	--	8.3
C-NR3-D	1/27/2016		ND (0.2)	ND (1)	1,000	8.2
C-NR3-D	2/24/2016		ND (0.2)	ND (1)	1,100	8.2
C-NR3-D	4/28/2016		ND (0.2)	ND (1)	1,090	8.2
C-NR3-D	4/28/2016	FD	ND (0.2)	ND (1)	--	8.2
C-NR3-D	7/7/2016		ND (0.2)	ND (1)	--	8.2
C-NR3-D	11/30/2016		ND (0.2)	ND (1)	1,010	8.4
C-NR3-S	1/27/2016		ND (0.2)	ND (1)	1,000	8.2
C-NR3-S	2/24/2016		ND (0.2)	ND (1)	1,100	8.2
C-NR3-S	4/28/2016		ND (0.2)	ND (1)	1,090	8.2
C-NR3-S	7/7/2016		ND (0.2)	ND (1)	--	8.3
C-NR3-S	11/30/2016		ND (0.2)	ND (1)	1,010	8.2
C-NR4-D	1/27/2016		ND (0.2)	ND (1)	1,000	8.2
C-NR4-D	2/24/2016		ND (0.2)	ND (1)	1,100	8.2
C-NR4-D	4/28/2016		ND (0.2)	ND (1)	1,090	8.2
C-NR4-D	7/7/2016		ND (0.2)	ND (1)	--	8.3
C-NR4-D	11/30/2016		ND (0.2)	ND (1)	1,010	8.3
C-NR4-S	1/27/2016		ND (0.2)	ND (1)	1,000	8.2
C-NR4-S	2/24/2016		ND (0.2)	ND (1)	1,100	8.2
C-NR4-S	4/28/2016		ND (0.2)	ND (1)	1,090	8.2
C-NR4-S	7/7/2016		ND (0.2)	ND (1)	--	8.3
C-NR4-S	11/30/2016		ND (0.2)	ND (1)	1,010	8.2
C-R22A-D	1/26/2016		ND (0.2)	ND (1)	1,010	8.3
C-R22A-D	2/23/2016		ND (0.2)	ND (1)	1,080	8.2
C-R22A-D	4/27/2016		ND (0.2)	ND (1)	990	8.2
C-R22A-D	7/6/2016		ND (0.2)	ND (1)	835	8.2
C-R22A-D	11/29/2016		ND (0.2)	ND (1)	1,020	8.2
C-R22A-S	1/26/2016		ND (0.2)	ND (1)	1,020	8.3
C-R22A-S	2/23/2016		ND (0.2)	ND (1)	1,080	8.2
C-R22A-S	4/27/2016		ND (0.2)	ND (1)	993	8.2
C-R22A-S	7/6/2016		ND (0.2)	ND (1)	835	8.3
C-R22A-S	11/29/2016		ND (0.2)	ND (1)	1,020	8.2
C-R27-D	1/26/2016		ND (0.2)	ND (1)	1,010	8.3
C-R27-D	2/23/2016		ND (0.2)	ND (1)	1,090	8.2
C-R27-D	4/28/2016		ND (0.2)	ND (1)	1,110	8.2
C-R27-D	7/6/2016		ND (0.2)	ND (1)	838	8.2
C-R27-D	11/29/2016		ND (0.2)	ND (1)	1,010	8.2
C-R27-S	1/26/2016		ND (0.2)	ND (1)	1,010	8.3
C-R27-S	2/23/2016		ND (0.2)	ND (1)	1,080	8.2
C-R27-S	4/28/2016		ND (0.2)	ND (1)	1,090	8.2
C-R27-S	7/6/2016		ND (0.2)	ND (1)	838	8.3
C-R27-S	11/29/2016		ND (0.2)	ND (1)	1,010	8.2
C-TAZ-D	2/5/2016		ND (0.2)	ND (1)	1,050	8.3
C-TAZ-D	2/23/2016		ND (0.2)	ND (1)	1,080	8.2
C-TAZ-D	4/27/2016		ND (0.2)	ND (1)	984	8.2
C-TAZ-D	7/6/2016		ND (0.2)	ND (1)	857	8.3
C-TAZ-D	11/29/2016		ND (0.2)	ND (1)	1,350	8.2

Table 3-4

Surface Water Sampling Results, January 2016 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California

Location ID	Sample Date		Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)	Specific Conductance (µS/cm)	Lab pH*
C-TAZ-D	11/29/2016	FD	ND (0.2)	ND (1)	--	8.2
C-TAZ-S	1/26/2016		ND (0.2)	ND (1)	1,010	8.3
C-TAZ-S	2/23/2016		ND (0.2)	ND (1)	1,080	8.2
C-TAZ-S	4/27/2016		ND (0.2)	ND (1)	984	8.2
C-TAZ-S	7/6/2016		ND (0.2)	ND (1)	832	8.3
C-TAZ-S	11/29/2016		ND (0.2)	ND (1)	1,020	7.4
Shoreline Samples						
R-19	1/26/2016		ND (0.2)	ND (1)	1,010	8.2
R-19	2/24/2016		ND (0.2)	ND (1)	1,090	8.2
R-19	4/27/2016		ND (0.2)	ND (1)	1,010	8.3
R-19	4/27/2016	FD	ND (0.2)	ND (1)	--	8.2
R-19	7/7/2016		ND (0.2)	ND (1)	--	8.3
R-19	11/30/2016		ND (0.2)	ND (1)	1,020	8.3
R-28	1/26/2016		ND (0.2)	ND (1)	1,020	8.2
R-28	1/26/2016	FD	ND (0.2)	ND (1)	--	8.3
R-28	2/24/2016		ND (0.2)	ND (1)	1,090	8.2
R-28	4/27/2016		ND (0.2)	ND (1)	994	8.3
R-28	7/7/2016		ND (0.2)	ND (1)	--	8.2
R-28	11/29/2016		ND (0.2)	ND (1)	1,020	8.4
R-28	11/29/2016	FD	ND (0.2)	ND (1)	--	8.2
R63	1/26/2016		ND (0.2)	ND (1)	1,010	8.3
R63	2/23/2016		ND (0.2)	ND (1)	1,080	8.1
R63	4/27/2016		ND (0.2)	ND (1)	996	8.1
R63	7/6/2016		ND (0.2)	ND (1)	836	8.3
R63	11/29/2016		ND (0.2)	ND (1)	1,020	8.2
RMP-AB1	11/29/2016		ND (0.2)	--	--	--
RMP-AB2	11/29/2016		ND (0.2)	--	--	--
RMP-AB3	11/30/2016		ND (0.2)	--	--	--
RRB	2/24/2016		ND (0.2)	ND (1)	1,090	8.2
RRB	4/28/2016		ND (0.2)	ND (1)	1,090	8.2
RRB	7/7/2016		ND (0.2)	ND (1)	--	8.3
RRB	11/30/2016		ND (0.2)	ND (1)	1,020	8.3
SW1	1/27/2016		ND (0.2)	ND (1)	1,160	7.6
SW1	2/23/2016		ND (0.2)	ND (1)	1,180	7.7
SW1	4/28/2016		ND (0.2)	ND (1)	1,140	7.6
SW1	7/7/2016		ND (0.2)	ND (1)	--	8.0
SW1	11/30/2016		ND (0.2)	ND (1)	1,050	8.0
SW2	1/27/2016		ND (0.2)	ND (1)	1,050	7.8
SW2	4/28/2016		ND (0.2)	ND (1)	1,140	7.5
SW2	7/7/2016		ND (0.2)	ND (1)	--	7.9
SW2	11/30/2016		ND (0.2)	ND (1)	1,050	8.1

Notes:

* Lab pH Values were all J flagged by the lab for being out of holding time.
FD = field duplicate sample.
J = concentration or reporting limit estimated by laboratory or data validation.
ND = not detected at listed reporting limit.
USEPA = United States Environmental Protection Agency

Table 3-4

Surface Water Sampling Results, January 2016 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

Location ID	Sample Date	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)	Specific Conductance (µS/cm)	Lab pH*

µg/L = micrograms per liter.
µS/cm = microSiemens per centimeter.

Hexavalent chromium analytical Method USEPA 218.6 (reporting limit 0.2 ug/L for undiluted samples).

Other analytical methods: dissolved chromium - Method SW6020A; specific conductance - USEPA 120.1; pH -SM4500-HB.

pH is reported to two significant figures.

Table 3-5

COPCs, In Situ Byproducts, and Geochemical Indicator Parameters in Surface Water Samples, January 2016 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California

Location ID	Sample Date		Arsenic, Dissolved (µg/L)	Barium, Dissolved (µg/L)	Iron, Total (µg/L)	Iron, Dissolved (µg/L)	Manganese, Dissolved (µg/L)	Molybdenum, Dissolved (µg/L)	Nitrate/Nitrite as Nitrogen (µg/L)	Selenium, Dissolved (µg/L)	Total Suspended Solids (mg/L)
In-channel locations											
C-BNS-D	1/26/2016		2.3	140	93	ND (20)	ND (0.5)	5.6	0.45	1.6 J	ND (10)
C-BNS-D	2/23/2016		2.3	140	140	ND (20)	ND (0.5)	5.4	0.52	1.7	ND (10)
C-BNS-D	4/27/2016		2.1	120	40	ND (20)	ND (0.5)	4.9	0.39	1.4	ND (10)
C-BNS-D	4/27/2016	FD	2.1	120	40	ND (20)	ND (0.5)	4.7	0.39	1.4	ND (10)
C-BNS-D	7/6/2016		2.2	130	70	ND (20)	0.58	5.1	0.39	1.6	ND (10)
C-BNS-D	11/29/2016		2.3	130	39	ND (20)	ND (0.5)	5.6	0.31	1.6	ND (10)
C-CON-D	1/27/2016		2.3	140	130	ND (20)	ND (0.5)	5.2	0.48	1.6	ND (10)
C-CON-D	2/24/2016		2.3	140	150	ND (20)	ND (0.5)	5.8	0.56	1.7	12
C-CON-D	4/28/2016		2.3	140	82	ND (20)	ND (0.5)	5.5	0.42	1.9	ND (10)
C-CON-D	7/7/2016		2.4	130	140 J	ND (20)	ND (0.5)	5.6	0.43	1.6	ND (10)
C-CON-D	11/30/2016		2.4	130	61	ND (20)	ND (0.5)	5.5	0.37	1.7	ND (10)
C-CON-S	1/27/2016		2.3	130	67	ND (20)	ND (0.5)	5.1	0.48	1.6	ND (10)
C-CON-S	2/24/2016		2.4	140	120	ND (20)	ND (0.5)	5.6	0.51	1.8	ND (10)
C-CON-S	4/28/2016		2.2	130	64	ND (20)	ND (0.5)	5.2	0.42	1.7	ND (10)
C-CON-S	7/7/2016		2.3	140	99	ND (20)	ND (0.5)	5.3	0.45	1.6	ND (10)
C-CON-S	11/30/2016		2.4	130	160	ND (20)	ND (0.5)	5.7	0.32	1.6	ND (10)
C-I-3-D	1/26/2016		2.4	140	170	27	0.63	5.8	0.49	1.8	ND (10)
C-I-3-D	2/23/2016		2.3	140	150	31	ND (0.5)	5.4	0.51	1.7	14
C-I-3-D	4/27/2016		2.1	130	95	ND (20)	ND (0.5)	4.9	0.38	1.6	ND (10)
C-I-3-D	7/6/2016		2.3	130	43	ND (20)	ND (0.5)	5.3	0.42	1.5	ND (10)
C-I-3-D	11/29/2016		2.4	130	57	ND (20)	ND (0.5)	5.8	0.34	1.7	ND (10)
C-I-3-S	1/26/2016		2.3	140	100	29	ND (0.5)	5.8	0.5	1.7	ND (10)
C-I-3-S	2/23/2016		2.4	140	94	ND (20)	ND (0.5)	5.4	0.49	1.8	ND (10)
C-I-3-S	4/27/2016		2.2	120	40	ND (20)	ND (0.5)	5.1	0.38	1.5	ND (10)
C-I-3-S	7/6/2016		2.4	130	31	ND (20)	ND (0.5)	5.5	0.42	1.5	ND (10)
C-I-3-S	11/29/2016		2.3	130	53	ND (20)	ND (0.5)	5.5	0.33	1.4	ND (10)
C-I-3-S	11/29/2016	FD	2.4	130	52	ND (20)	ND (0.5)	5.5	0.33	1.4	ND (10)
C-MAR-D	1/27/2016		2.4	140	1,200	86	40	5.5	0.45	1.7	54
C-MAR-D	2/23/2016		2.6	140	3,200	420	110	5.6	0.5	1.6	140
C-MAR-D	4/27/2016		2.1	120	4,000	35	53	5.4	0.27	1.5	100
C-MAR-D	7/6/2016		3.1	140	580	ND (20)	120	5.5	0.29	1.4	160
C-MAR-D	11/30/2016		2.3	140	2,000	ND (20)	62	5.6	0.34	1.5	51
C-MAR-S	1/27/2016		2.3	140	780	ND (20)	70	5.6	0.46	1.7	55
C-MAR-S	2/23/2016		2.4	140	2,200	35	110	5.8	0.5	1.5	120
C-MAR-S	4/27/2016		1.9	120	4,000	ND (20)	49	5	0.24	1.3	100
C-MAR-S	7/6/2016		3.2	140	600	23	130	5.6	0.3	1.2	150
C-MAR-S	11/30/2016		2.3	150	3,500	26	89	6	0.3	1	55
C-NR1-D	1/27/2016		2.3	130	99	ND (20)	ND (0.5)	5.1	0.45	1.8	ND (10)
C-NR1-D	2/24/2016		2.3	140	160	ND (20)	ND (0.5)	5.4	0.52	1.6	ND (10)

Table 3-5

COPCs, In Situ Byproducts, and Geochemical Indicator Parameters in Surface Water Samples, January 2016 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California

Location ID	Sample Date		Arsenic, Dissolved (µg/L)	Barium, Dissolved (µg/L)	Iron, Total (µg/L)	Iron, Dissolved (µg/L)	Manganese, Dissolved (µg/L)	Molybdenum, Dissolved (µg/L)	Nitrate/Nitrite as Nitrogen (µg/L)	Selenium, Dissolved (µg/L)	Total Suspended Solids (mg/L)
C-NR1-D	4/28/2016		2.3	140	56	ND (20)	ND (0.5)	5.4	0.4	1.8	ND (10)
C-NR1-D	7/7/2016		2.4	140	100	ND (20)	0.66	5.7	0.44	1.6	ND (10)
C-NR1-D	11/30/2016		2.3	130	100	ND (20)	ND (0.5)	5.6	0.33	1.7	ND (10)
C-NR1-S	1/27/2016		2.3	140	86	ND (20)	ND (0.5)	5.3	0.57	1.8	ND (10)
C-NR1-S	1/27/2016	FD	2.3	130	74	ND (20)	ND (0.5)	5.2	0.47	1.8	ND (10)
C-NR1-S	2/24/2016		2.3	140	91	ND (20)	ND (0.5)	5.3	0.52	1.7	ND (10)
C-NR1-S	4/28/2016		2.2	130	59	ND (20)	ND (0.5)	5.1	0.41	1.7	ND (10)
C-NR1-S	7/7/2016		2.3	130	58	ND (20)	0.77	5.3	0.38	1.6	ND (10)
C-NR1-S	11/30/2016		2.2	130	120 J	ND (20 J)	ND (0.5)	5.4	0.32	1.6	ND (10)
C-NR1-S	11/30/2016	FD	2.3	120	46 J	53 J	ND (0.5)	5.4	0.31	1.4	ND (10)
C-NR3-D	1/27/2016		2.3	140	170 J	ND (20)	ND (0.5)	5.2	0.47	1.8	ND (10)
C-NR3-D	2/24/2016		2.5	150	120	ND (20)	ND (0.5)	5.8	0.48	1.9	ND (10)
C-NR3-D	4/28/2016		2.3	130	110 J	64 J	ND (0.5)	5.4	0.42	2	ND (10)
C-NR3-D	4/28/2016	FD	2.2	130	59 J	ND (20 J)	ND (0.5)	5.3	0.41	1.8	ND (10)
C-NR3-D	7/7/2016		2.2	130	120	ND (20)	1.2	5.2	0.41	1.4	ND (10)
C-NR3-D	11/30/2016		2.3	120	55	ND (20)	ND (0.5)	5.4	0.32	1.5	ND (10)
C-NR3-S	1/27/2016		2.3	130	94	ND (20)	ND (0.5)	5.2	0.46	1.7	ND (10)
C-NR3-S	2/24/2016		2.3	130	92	ND (20)	ND (0.5)	5.1	0.52	1.7	ND (10)
C-NR3-S	4/28/2016		2.3	130	49	27 J	ND (0.5)	5	0.41	1.7	ND (10)
C-NR3-S	7/7/2016		2.4	130	62	26	0.88	5.4	0.38	1.5	ND (10)
C-NR3-S	11/30/2016		2.3	130	85	85	ND (0.5)	5.4	0.32	1.5	ND (10)
C-NR4-D	1/27/2016		2.4	140	120	ND (20)	ND (0.5)	5.8	0.45	1.8	ND (10)
C-NR4-D	2/24/2016		2.3	140	130	ND (20)	ND (0.5)	5.3	0.52	1.7	ND (10)
C-NR4-D	4/28/2016		2.2	130	43	24	ND (0.5)	5	0.49	1.6	ND (10)
C-NR4-D	7/7/2016		2.3	130	91	25	0.62	5.5	0.42	1.6	ND (10)
C-NR4-D	11/30/2016		2.3	130	48	54	ND (0.5)	5.5	0.31	1.5	ND (10)
C-NR4-S	1/27/2016		2.3	130	94	ND (20)	ND (0.5)	5.2	0.47	1.7	ND (10)
C-NR4-S	2/24/2016		2.4	140	100	ND (20)	ND (0.5)	5.5	0.5	1.7	ND (10)
C-NR4-S	4/28/2016		2.4	140	34	41	ND (0.5)	5.4	0.42	1.7	ND (10)
C-NR4-S	7/7/2016		2.3	130	49	ND (20)	ND (0.5)	5.3	0.41	1.6	ND (10)
C-NR4-S	11/30/2016		2.3	120	55	ND (20)	ND (0.5)	5.3	0.31	1.5	ND (10)
C-R22A-D	1/26/2016		2.3	140	160	33	0.73	5.7	0.46	1.8	ND (10)
C-R22A-D	2/23/2016		2.4	140	120	ND (20)	ND (0.5)	5.5	0.51	1.6	ND (10)
C-R22A-D	4/27/2016		2.1	130	110	ND (20)	ND (0.5)	5	0.4	1.4	ND (10)
C-R22A-D	7/6/2016		2.3	130	85	ND (20)	1.8	5.4	0.37	1.5	ND (10)
C-R22A-D	11/29/2016		2.2	130	73	ND (20)	ND (0.5)	5.4	0.37	1.6	ND (10)
C-R22A-S	1/26/2016		2.2	140	110	ND (20)	ND (0.5)	5.6	0.45	1.7	ND (10)
C-R22A-S	2/23/2016		2.3	130	120	ND (20)	6.8	5.2	0.51	1.5	ND (10)
C-R22A-S	4/27/2016		2.3	130	87	110	ND (0.5)	5.1	0.4	1.7	ND (10)
C-R22A-S	7/6/2016		2.5	140	68	ND (20)	2.3	5.7	0.4	1.7	ND (10)

Table 3-5

COPCs, In Situ Byproducts, and Geochemical Indicator Parameters in Surface Water Samples, January 2016 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California

Location ID	Sample Date	Arsenic, Dissolved (µg/L)	Barium, Dissolved (µg/L)	Iron, Total (µg/L)	Iron, Dissolved (µg/L)	Manganese, Dissolved (µg/L)	Molybdenum, Dissolved (µg/L)	Nitrate/Nitrite as Nitrogen (µg/L)	Selenium, Dissolved (µg/L)	Total Suspended Solids (mg/L)
C-R22A-S	11/29/2016	2.4	130	99	ND (20)	ND (0.5)	5.6	0.33	1.6	ND (10)
C-R27-D	1/26/2016	2.3	140	79	23	ND (0.5)	5.5	0.47	1.6	ND (10)
C-R27-D	2/23/2016	2.4	140	130	29	ND (0.5)	5.4	0.5	1.6	ND (10)
C-R27-D	4/28/2016	2.3	130	78	40	ND (0.5)	5.1	0.37	1.7	ND (10)
C-R27-D	7/6/2016	2.3	130	31	ND (20)	1.6	5.2	0.39	1.6	ND (10)
C-R27-D	11/29/2016	2.4	130	56	23	ND (0.5)	5.6	0.25	1.6	ND (10)
C-R27-S	1/26/2016	2.3	140	93	ND (20)	ND (0.5)	5.7	0.49	1.7	ND (10)
C-R27-S	2/23/2016	2.4	140	100	ND (20)	ND (0.5)	5.5	0.5	1.7	ND (10)
C-R27-S	4/28/2016	2.2	140	60	20	ND (0.5)	5.2	0.38	1.6	ND (10)
C-R27-S	7/6/2016	2.3	130	34	ND (20)	1.1	5.3	0.38	1.5	ND (10)
C-R27-S	11/29/2016	2.3	130	57	ND (20)	ND (0.5)	5.8	0.35	1.5	ND (10)
C-TAZ-D	2/5/2016	2.4	140	95	ND (20)	ND (0.5)	5.8	0.47	1.8	ND (10)
C-TAZ-D	2/23/2016	2.3	130	150	ND (20)	ND (0.5)	5.4	0.56	1.7	ND (10)
C-TAZ-D	4/27/2016	2.4	130	83	ND (20)	ND (0.5)	5.2	0.42	1.5	ND (10)
C-TAZ-D	7/6/2016	2.3	130	25	ND (20)	ND (0.5)	5.4	0.41	1.7	ND (10)
C-TAZ-D	11/29/2016	2.4	130	66	ND (20)	ND (0.5)	5.4	0.32	1.5	ND (10)
C-TAZ-D	11/29/2016 FD	2.4	130	65	ND (20)	ND (0.5)	5.6	0.33	1.7	ND (10)
C-TAZ-S	1/26/2016	2.4	140	83	36	ND (0.5)	5.6	0.46	1.8	ND (10)
C-TAZ-S	2/23/2016	2.2	130	110	ND (20)	ND (0.5)	5.2	0.51	1.6	ND (10)
C-TAZ-S	4/27/2016	2.4	130	55	ND (20)	ND (0.5)	5.5	0.41	1.6	ND (10)
C-TAZ-S	7/6/2016	2.3	130	26	ND (20)	0.6	5.3	0.42	1.6	ND (10)
C-TAZ-S	11/29/2016	2.4	130	85	ND (20)	ND (0.5)	5.7	0.31	1.3	ND (10)
Shoreline Samples										
R-19	1/26/2016	2.3	140	120	ND (20)	ND (0.5)	5.7	0.52	1.6	ND (10)
R-19	2/24/2016	2.3	140	84	ND (20)	ND (0.5)	5.5	1.1	1.6	ND (10)
R-19	4/27/2016	2.2	130	63	ND (20)	ND (0.5)	5.2	0.38	1.5	ND (10)
R-19	4/27/2016 FD	2.2	120	65	ND (20)	ND (0.5)	4.9	0.39	1.5	ND (10)
R-19	7/7/2016	2.3	140	71	33	1.8	5.4	0.38	1.6	ND (10)
R-19	11/30/2016	2.3	130	39	ND (20)	ND (0.5)	5.4	0.57	1.5	ND (10)
R-28	1/26/2016	2.2	140	67	25	ND (0.5)	5.5	0.47	1.7	ND (10)
R-28	1/26/2016 FD	2.3	150 J	120	ND (20)	0.69	5.8	0.46	1.8	ND (10)
R-28	2/24/2016	2.2	140 J	130	ND (20)	ND (0.5)	5.3	0.52	1.6	ND (10)
R-28	4/27/2016	2.1	120	110	28	ND (0.5)	4.9	0.42	1.6	ND (10)
R-28	7/7/2016	2.3	130	83 J	22	1.6	5.4	0.44	1.5	ND (10)
R-28	11/29/2016	2.3	130	65	ND (20)	ND (0.5)	5.8	0.31	1.5	ND (10)
R-28	11/29/2016 FD	2.3	120	92	ND (20)	ND (0.5)	5.3	0.42	1.5	ND (10)
R63	1/26/2016	2.3	140	310	32	0.96	5.7	0.44	1.7	10
R63	2/23/2016	2.3	140	400 J	ND (20)	0.61	5.3	0.55	1.6	19
R63	4/27/2016	2.2	120	71	ND (20)	5.3	5	0.38	1.3	ND (10)
R63	7/6/2016	2.4	130	190	ND (20)	9.1	5.4	0.4	1.5	ND (10)

Table 3-5

COPCs, In Situ Byproducts, and Geochemical Indicator Parameters in Surface Water Samples, January 2016 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide
Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

Location ID	Sample Date	Arsenic, Dissolved (µg/L)	Barium, Dissolved (µg/L)	Iron, Total (µg/L)	Iron, Dissolved (µg/L)	Manganese, Dissolved (µg/L)	Molybdenum, Dissolved (µg/L)	Nitrate/Nitrite as Nitrogen (µg/L)	Selenium, Dissolved (µg/L)	Total Suspended Solids (mg/L)
R63	11/29/2016	2.5	130	120	28	0.6	5.8	0.38	1.4	ND (10)
RRB	2/24/2016	2.3	140	55	ND (20)	ND (0.5)	5.4	0.53	1.6	ND (10)
RRB	4/28/2016	2.2	140	66	ND (20)	0.67	5.3	0.37	1.7	ND (10)
RRB	7/7/2016	2.3	130	47	ND (20)	2.5	5.4	0.38	1.5	ND (10)
RRB	11/30/2016	2.3	130	220	89	ND (0.5)	5.2	0.3	1.5	ND (10)

Notes:
--- = data were either not collected, not available or were rejected
COPC = contaminants of potential concern (molybdenum, selenium, and nitrate).
J = concentration or reporting limit estimated by laboratory or data validation.
mg/L = milligrams per liter.
ND = not detected at listed reporting limit.
TSS = total suspended solids.
ug/L = micrograms per liter.
USEPA = United States Environmental Protection Agency.

Geochemical indicator parameters (TSS and alkalinity).
In situ byproducts (arsenic, iron and manganese).

USEPA Methods:
Alkalinity - SM2320B.
Metals - SW6010B/SW6020A.
Nitrate - SM4500NO3.
Total Suspended Solids - SM2540D.

Table 4-1
Pumping Rate and Extracted Volume for IM System, Fourth Quarter 2016 and Annual 2016
Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

Extraction Well ID	November 2016		December 2016		Fourth Quarter 2016		Annual 2016	
	Average Pumping Rate [a] (gpm)	Volume Pumped (gal)	Average Pumping Rate [a] (gpm)	Volume Pumped (gal)	Average Pumping Rate [a] (gpm)	Volume Pumped (gal)	Average Pumping Rate [a] (gpm)	Volume Pumped (gal)
TW-02S	0.00	0	0.00	191	0.00	191	0.00	191
TW-02D	0.00	0	0.00	87	0.00	87	3.95	2,012,493
TW-03D	119.53	5,163,646	125.81	5,616,241	122.67	10,779,888	115.07	60,501,438
PE-01	15.20	656,701	9.21	411,153	12.21	1,067,854	10.21	5,396,442
TOTAL	**134.7**	**5,820,348**	**135.0**	**6,027,672**	**134.9**	**11,848,020**	**129.2**	**67,910,564**

Chromium Removed This Quarter (kg)	35.8
Chromium Removed This Year (kg)	149
Chromium Removed Project to Date (kg)	3990
Chromium Removed This Quarter (lb)	78.8
Chromium Removed This Year (lb)	328
Chromium Removed Project to Date (lb)	8800

Notes:
DTSC = Department of Toxic Substances Control.
gal = gallons.
gpm = gallons per minute.
IM = Interim Measures.
kg = kilograms.
lb = pounds.

a The "Average Pumping Rate" is the overall average during the reporting period, including system downtime, based on flow meter readings.

Chromium removed includes the period from October 1, 2016 through December 31, 2016. On July 23, 2010 DTSC approved a revised reporting schedule for this report that included a revised IM-3 sample collection period from October 1, 2016 through December 31, 2016.

Table 4-2

Average Hydraulic Gradients Measured at Well Pairs, Fourth Quarter 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

Well Pair[a]	Reporting Period	Mean Landward[b] Hydraulic Gradient (feet/foot)	Days in[c] Monthly Average
Overall Average	November	0.0083	NA
	December	0.0059	NA
Northern Gradient Pair MW-31-135 / MW-33-150	November	0.0022	30
	December	0.0022	31
Central Gradient Pair MW-45-095[d] / MW-34-100	November	0.0173	30
	December	0.0118	31
Southern Gradient Pair MW-45-095[d] / MW-27-085	November	0.0054	30
	December	0.0037	31

Notes:

NA = All available data used in calculating overall average except where noted.
IM = Interim measure

[a] Refer to Figure 1-4 for locations of well pairs.
[b] For IM pumping, the target landward gradient for the selected well pairs is 0.001 feet/foot.
[c] Number of days transducers in both wells were operating correctly / total number of days in month.
[d] MW-45-095 is also known as MW-45-095a.

Table 4-3

Predicted and Actual Monthly Average Davis Dam Discharge and Colorado River Elevation at I-3

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and

Sitewide Groundwater and Surface Water Monitoring Report,

PG&E Topock Compressor Station, Needles, California

	Davis Dam Release			Colorado River Elevation at I-3		
Month	Projected (cfs)	Actual (cfs)	Difference (cfs)	Predicted (ft amsl)	Actual (ft amsl)	Difference (feet)
January 2013	8,300	8,299	1	453.2	453.28	0.04
February 2013	10,600	10,972	-372	454.3	454.63	0.4
March 2013	15,200	15,545	-345	456.0	456.29	0.3
April 2013	17,600	17,090	510	456.9	456.74	-0.1
May 2013	15,800	15,592	208	456.4	456.44	0.0
June 2013	15,700	15,588	112	456.5	456.47	0.0
July 2013	14,400	13,165	1,235	456.0	455.79	-0.2
August 2013	13,100	12,185	915	455.4	455.43	0.0
September 2013	11,700	11,446	254	454.8	455.02	0.2
October 2013	12,300	12,497	-197	454.9	455.09	0.2
November 2013	9,700	8,918	782	454.0	453.98	0.0
December 2013	6,400	7,636	-1,236	452.4	452.81	0.4
January 2014	8,300	8,970	-670	452.8	453.27	0.5
February 2014	11,600	11,850	-250	454.3	454.67	0.3
March 2014	16,600	17,473	-873	456.4	456.70	0.3
April 2014	18,200	17,718	482	457.1	457.08	0.0
May 2014	16,700	16,622	78	456.8	456.68	-0.1
June 2014	15,900	15,917	-17	456.6	456.64	0.1
July 2014	15,100	14,640	460	456.3	456.24	0.0
August 2014	12,300	11,336	964	455.2	455.26	0.1
September 2014	13,100	12,211	889	455.3	455.30	0.0
October 2014	10,700	10,434	266	454.3	454.81	0.5
November 2014	10,700	10,575	125	454.3	454.22	-0.1
December 2014	6,400	7,235	-835	452.4	452.93	0.5
January 2015	10,600	10,740	-140	454.3	454.39	0.1
February 2015	10,500	11,252	-752	454.2	454.52	0.3
March 2015	14,900	15,658	-758	455.9	456.29	0.4
April 2015	18,000	17,170	830	457.1	456.82	-0.3
May 2015	16,000	13,890	2110	456.5	456.06	-0.5
June 2015	14,500	13,616	884	456.1	455.94	-0.2
July 2015	13,400	12,411	989	455.6	455.50	-0.1
August 2015	12,100	12,627	-527	455.1	455.45	0.4

Table 4-3

Predicted and Actual Monthly Average Davis Dam Discharge and Colorado River Elevation at I-3

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Sitewide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California

	Davis Dam Release			Colorado River Elevation at I-3		
Month	Projected (cfs)	Actual (cfs)	Difference (cfs)	Predicted (ft amsl)	Actual (ft amsl)	Difference (feet)
September 2015	13,300	12,734	566	455.4	INC	NA
October 2015	11,300	10,653	647	454.7	454.80	0.1
November 2015	10,000	10,066	-66	454.2	453.87	0.29
December 2015	6,200	8,556	-2356	453.3	453.48	-0.18
January 2016	9,400	9,000	400	453.4	454.05	-0.60
February 2016	11,300	11,700	-400	454.4	454.95	-0.57
March 2016	15,800	15,000	800	455.9	456.51	-0.65
April 2016	15,400	16,400	-1000	456.8	457.17	-0.40
May 2016	15,800	14,700	1100	456.0	456.76	-0.78
June 2016	14,400	14,100	300	456.0	456.64	-0.62
July 2016	13,300	13,100	200	455.7	456.38	-0.65
August 2016	11,500	11,600	-100	455.0	455.70	-0.69
September 2016	12,200	11,900	300	455.2	455.83	-0.63
October 2016	10,400	10,400	0	454.2	455.23	-0.98
November 2016	9,900	9,600	300	453.7	454.40	-0.70
December 2016	8,300	7,800	500	453.4	453.55	-0.18
January 2017	8,000			453.2		

NOTES:

cfs = cubic feet per second

ft amsl = feet above mean sea level.

INC = incomplete data set for Colorado River elevation at I-3

NA = difference in predicted and actual river elevation not available due to incomplete data set

Projected river level for each month in the past is calculated based on the preceding months USBR projections of Davis Dam release and stage in Lake Havasu. Future projections of river level at I-3 are based upon January 2017 USBR projections.

These data are reported monthly by the US Department of Interior, at http://www.usbr.gov/lc/region/g4000/24mo.pdf.

The difference in I-3 elevation is the difference between the I-3 elevation predicted and the actual elevation measured at I-3.

The source of this difference is differences between BOR projections and actual dam releases/Havasu reservoir levels, rather than the multiple regression error.

TABLE 5-1
Summary of Pumping Rate and Extracted Volume for 2016 Reporting Period
Fourth Quarter 2016 and Annual Interim Measures Performance
Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

Reporting Period	Target Pump Rate (gpm)	Actual Monthly Pump Rate (gpm)	Individual Extraction Well Operations				Total Volume (gallons)
			TW-2S (gallons)	TW-2D (gallons)	TW-3D (gallons)	PE-1 (gallons)	
Jan-16	135	133.0	--	--	4,687,002	1,252,292	5,939,295
Feb-16	135	127.6	--	922,573	4,494,616	95,681	5,512,871
Mar-16	135	128.0	--	979,231	4,728,262	4,251	5,711,743
Apr-16	135	97.3	--	108,850	3,921,560	173,758	4,204,168
May-16	135	135.5	--	1,038	5,949,866	99,290	6,050,193
Jun-16	135	135.0	--	589	5,617,177	212,261	5,830,027
Jul-16	135	135.4	--	125	5,801,504	241,805	6,043,434
Aug-16	135	114.1	--	--	4,582,592	508,884	5,091,476
Sep-16	135	134.0	--	--	5,006,099	781,313	5,787,413
Oct-16	135	132.0	--	--	4,932,872	959,052	5,891,923
Nov-16	135	134.7	--	--	5,163,646	656,701	5,820,348
Dec-16	135	135.0	191	87	5,616,241	411,153	6,027,672
Totals for 2016 Annual Period		128.5	191	2,012,493	60,501,438	5,396,442	67,910,564

Notes:
gpm: gallons per minute
The target pumping rate of 135 gpm, excluding periods of planned and unplanned downtime, was maintained by pumping from extraction wells TW-3D and PE-1 during the 2016 reporting period.
Extraction wells TW-2S and TW-2D were only used for interim service or to support field operations.

Table 5-2

Analytical Results for Extraction Wells, January 2016 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

Location ID	Sample Date		Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)	Total Dissolved Solids (mg/L)	Lab pH*
PE-01	1/6/2016		3.8	3.6	2,400	7.6
PE-01	2/2/2016		3.9	3.3	2,600	7.6
PE-01	3/2/2016		0.79	ND (1)	2,500	7.6
PE-01	4/27/2016		1.2	1.1	2,100	7.6
PE-01	5/10/2016		ND (0.2)	ND (1)	2,000	7.5
PE-01	6/7/2016		0.83	ND (1)	2,200	7.5
PE-01	7/6/2016		ND (0.2)	ND (1)	2,400	--
PE-01	8/3/2016		0.8	ND (1)	2,400	7.5
PE-01	9/8/2016		1.1	1.1	2,600	7.6
PE-01	10/6/2016		0.57	ND (1)	2,700	7.5
PE-01	10/6/2016	FD	0.82	ND (1)	2,700	7.6
PE-01	11/2/2016		2	1.7	2,700	7.6
PE-01	12/6/2016		1.2	1.1	2,400	7.5 J
TW-02D	5/10/2016		46	47	4,500	7.3
TW-02D	7/6/2016		52	57	3,400	--
TW-02D	12/13/2016		ND (0.2)	ND (1)	4,000	--
TW-02S	12/13/2016		64	93	2,300	--
TW-03D	1/6/2016		740	740	4,600	7.4
TW-03D	2/2/2016		730	720	4,700	7.3
TW-03D	3/2/2016		790	840	4,700	7.2
TW-03D	4/27/2016		620	660	4,700	7.2
TW-03D	5/10/2016		610	620	4,400	7.3
TW-03D	6/7/2016		630	610	4,400	7.3
TW-03D	7/6/2016		610	650	4,500	--
TW-03D	8/3/2016		530	630	4,500	7.3
TW-03D	9/8/2016		600	580	4,500	7.4
TW-03D	10/6/2016		580	650	4,400	7.4
TW-03D	11/2/2016		590	630	4,500	7.3
TW-03D	11/2/2016	FD	590	620	4,600	7.5
TW-03D	12/6/2016		630	610	4,600	7.4 J

Notes:

* Lab pH Values were all J flagged by the lab for being out of holding time.
--- = data were either not collected, not available or were rejected
FD = sample is a field duplicate.
J = concentration or reporting limit estimated by laboratory or data validation.
mg/L = milligrams per liter.
ND = Not detected.
USEPA = United States Environmental Protection Agency
µg/L = micrograms per liter.

Groundwater samples from active extraction wells are taken at sample taps in Valve Vault 1 on the MW-20 bench.

Dissolved chromium was analyzed by Method SW6020A or USEPA200.8 or USEPA200.7, hexavalent chromium analyzed by Method SM3500-CrB or USEPA218.6, and total dissolved solids were analyzed by Method SM2540C

TABLE 5-3

Calculated Hydraulic Gradients for Well Pairs by Month for 2016 Reporting Period

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California

	Mean Landward Hydraulic Gradient (ft/ft)[a]			
Reporting Period 2016	**Overall Average[(b)]**	**Northern Gradient Pair[(c)] MW-31-135 / MW-33-150**	**Central Gradient Pair MW-45-095[d] / MW-34-100**	**Southern Gradient Pair MW-45-095[d] / MW-27-085**
January	0.0095	0.0022	0.0194	0.0068
February	0.0037	0.0027	0.0066	0.0019
March	0.0034	0.0028	0.0060	0.0014
April	0.0044	0.0020	0.0090	0.0022
May	0.0038	0.0027	0.0068	0.0020
June	0.0048	0.0027	0.0088	0.0028
July	0.0043	0.0024	0.0089	0.0016
August	0.0063	0.0018	0.0131	0.0041
September	0.0093	0.0022	0.0193	0.0063
October	0.0106	0.0021	0.0223	0.0074
November	0.0083	0.0022	0.0173	0.0054
December	0.0059	0.0022	0.0118	0.0037

Notes:

[a] For Interim measures pumping, the target landward gradient for the selected well pairs is 0.001 ft/ft

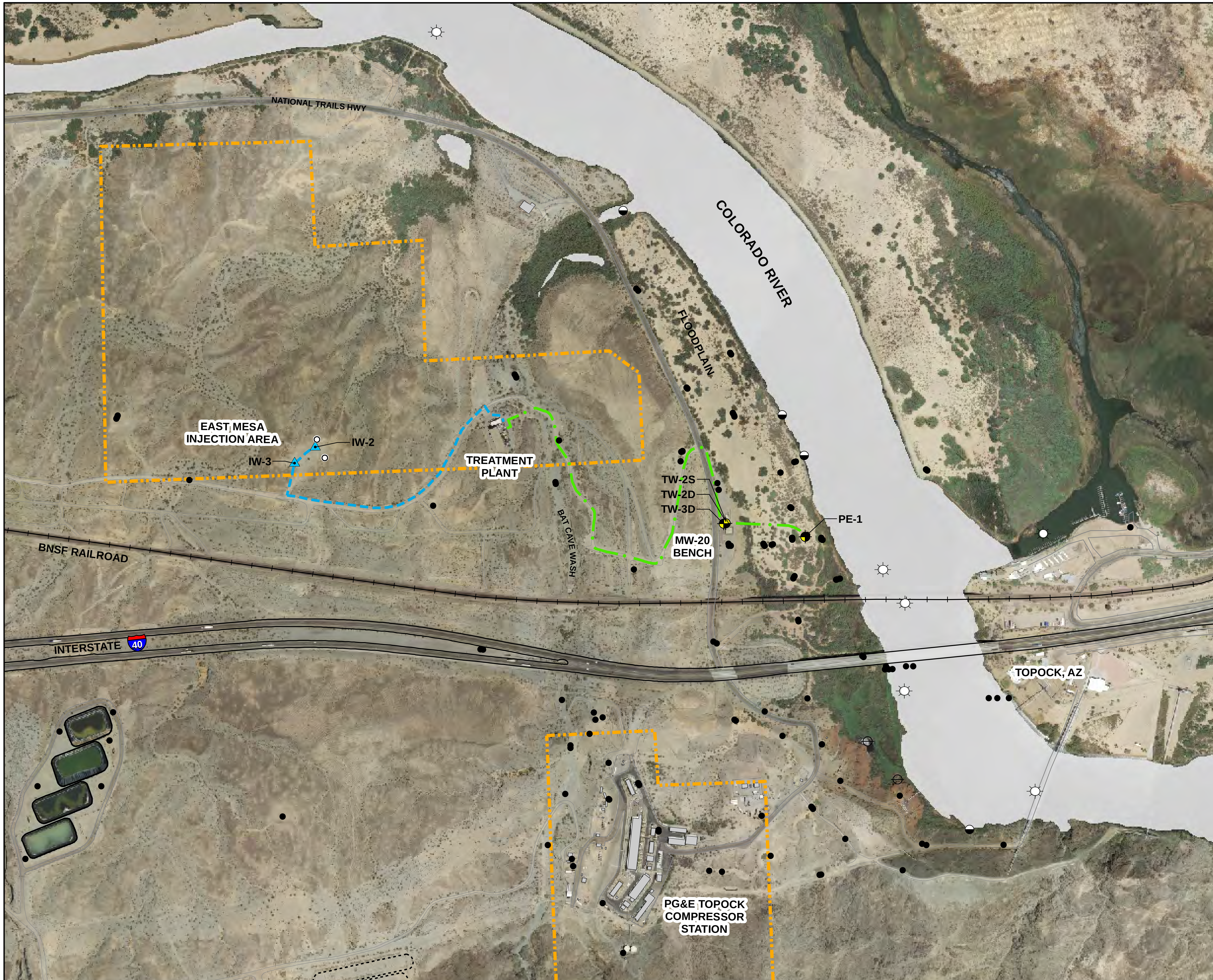
[b] Overall average gradients are calculated using all available data.

[c] Refer to Figure 1-4 for location of well pairs and Tables E-1 and E-2 for number of days in reporting period.
ft/ft = feet/foot

[d] MW-45-095 also referred to as MW-45-095a.

FIGURES

ARCADIS Design & Consultancy for natural and built assets



LEGEND

- Extraction Well (TW-03D and PE-01 are primary extraction wells; TW-02S and TW-02D are backup extraction wells)
- IM-3 Injection Well
- Monitoring Well in Site-Wide Groundwater Monitoring Program (GMP)
- Monitoring Well in IM-3 Compliance Monitoring Program
- Shoreline Surface Water Monitoring Location
- River Channel Surface Water Monitoring Location
- Other Surface Water Monitoring Location
- Groundwater Extraction/Influent Pipeline
- Treatment Plant Effluent Pipeline
- Property Line

Notes:
1. Location map shows Interim Measure No. 3 (IM-3) active facilities as of current report.
2. See Figures 1-2 and 1-3 for complete monitoring locations and identifications.

N

0 300 600
Feet

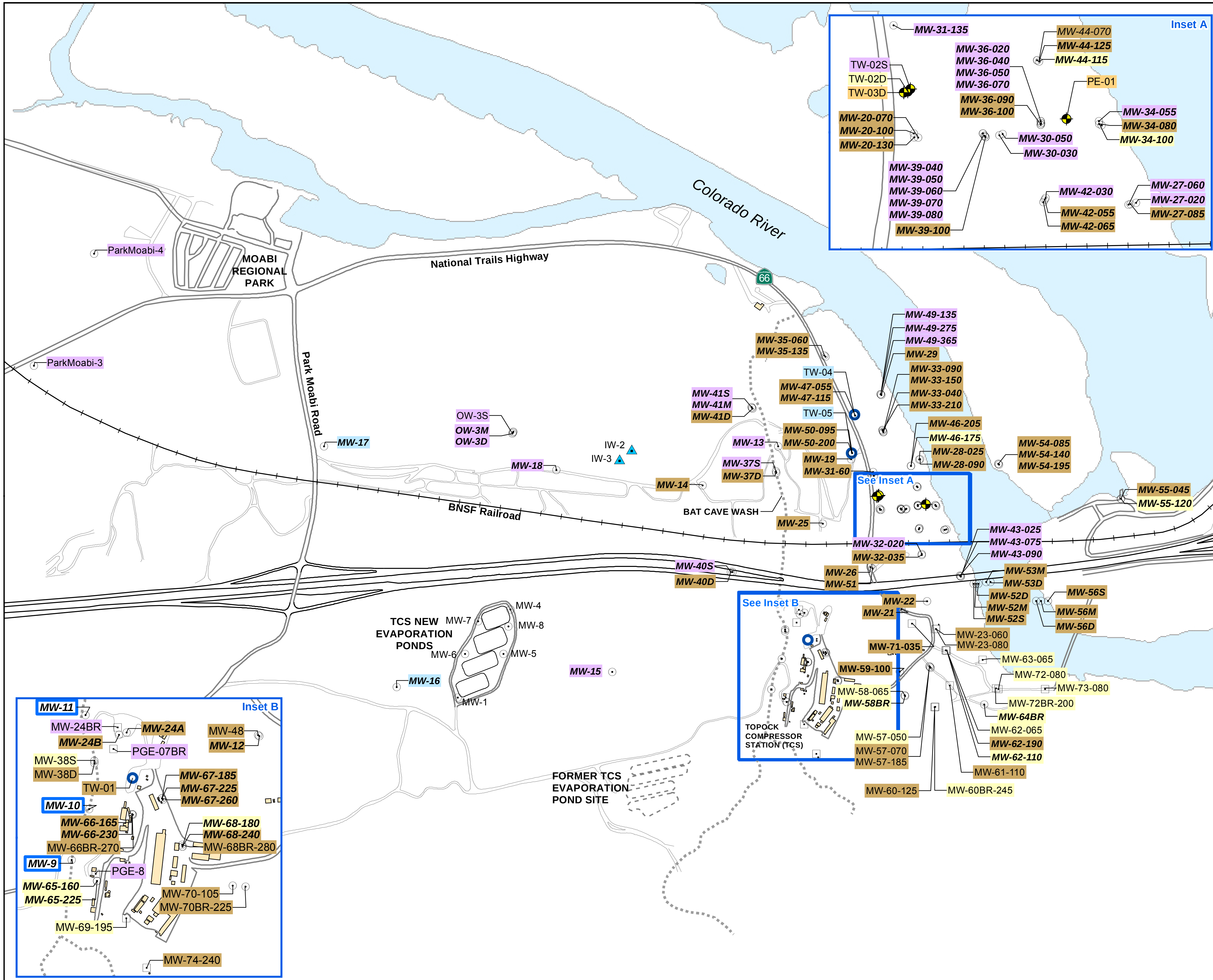
Service Layer Credits: Sources: Esri, DeLorme, NAVTEQ, USGS, NRCAN, METI, iPC, TomTom

FIGURE 1-1
LOCATIONS OF IM-3 FACILITIES AND MONITORING LOCATIONS

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

Created by: CRITIGEN

R:\GIS\TOPOCKGIS\MAPFILES\2016\GMP\2016Q4\FIGURE1-1_IM3_GMP_LOCS_2016Q4.MXD 3/14/2017 12:46:24 PM



ARCADIS Design & Consultancy for natural and built assets

LEGEND

- Groundwater Monitoring Well Completed in Bedrock
- Injection Well
- Groundwater Monitoring Well
- Test Well or Supply Well (Inactive)
- Extraction Well (TW-03D and PE-01 are primary extraction wells; TW-02S and TW-02D are backup extraction wells)

Sampling Frequency for Groundwater Monitoring Program (GMP)

- MW-17 Biennial sampling
- MW-13 Annual sampling
- MW-09 Collect additional sample in quarter following a runoff event with flow through Bat Cave Wash culverts.
- MW-21 Semiannual sampling
- TW-01 Quarterly sampling
- TW-3D Monthly sampling

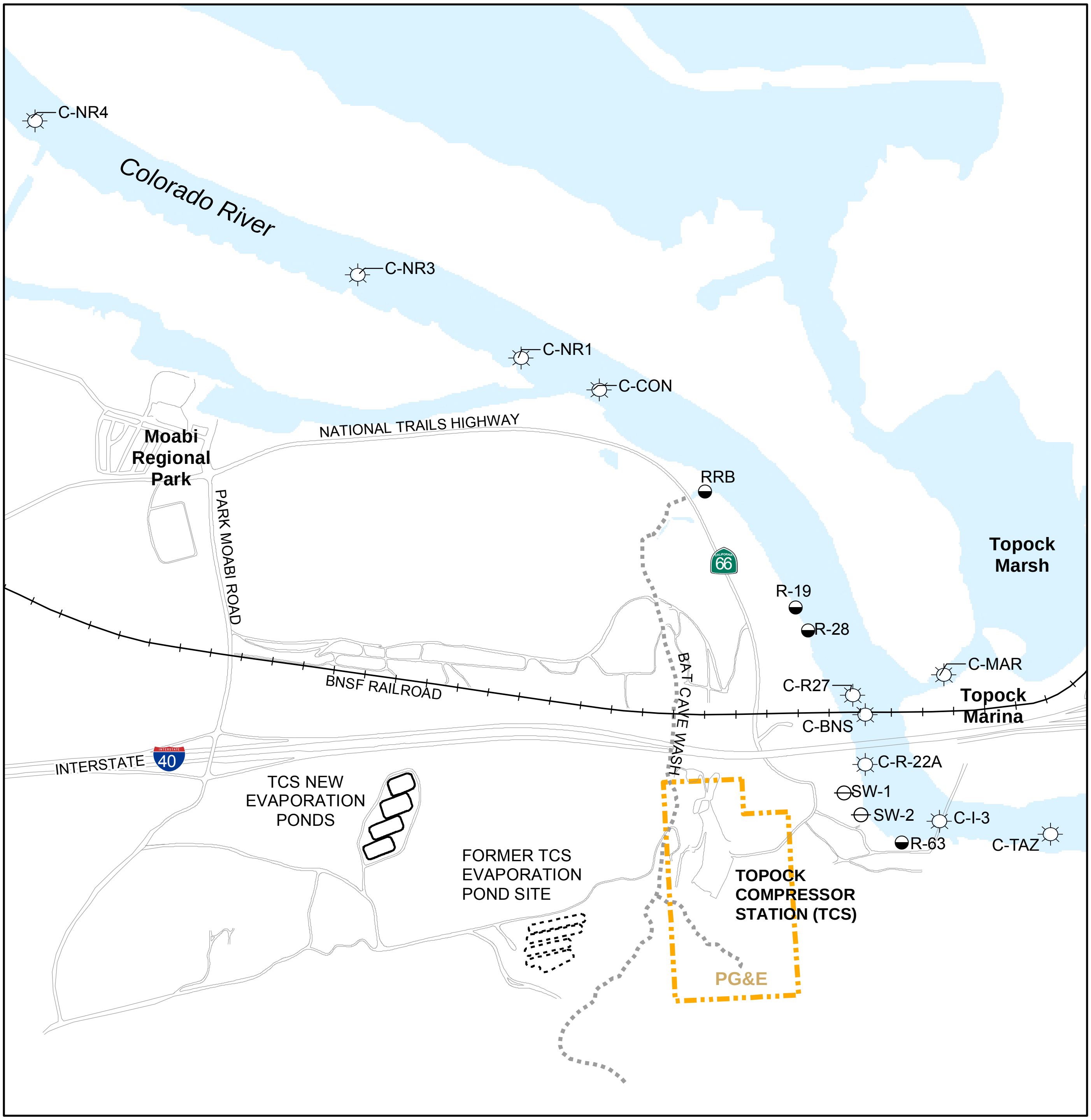
Notes:
Bold/Italicized labels indicate sample collected using low flow sampling method; otherwise, sample collected using the three-volume purge sampling method.

FIGURE 1-2
MONITORING LOCATIONS AND SAMPLING FREQUENCY FOR GMP

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

Created by: CRITIGEN

R:\GIS\TOPOCKGIS\MAPFILES\2016\GMP\2016Q4\FIGURE1-2_GMP_SAMPLING_FREQUENCY_2016Q4.MXD KDOLAN 3/14/2017 6:21:42 PM



LEGEND

- Shoreline Surface Water Monitoring Location
- River Channel Surface Water Monitoring Location
- Other Surface Water Monitoring Location

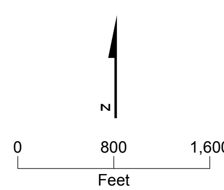


FIGURE 1-3
MONITORING LOCATIONS AND SAMPLING FREQUENCY FOR RMP

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

Notes:
1. Shoreline, river channel, and other surface water monitoring locations are sampled quarterly and twice during periods of low river stage (typically November - January).
2. Location for SW-2 is approximate. GPS coverage was not available.
3. RMP = River Monitoring Program
4. TCS = Topock Compressor Station

ARCADIS Design & Consultancy for natural and built assets

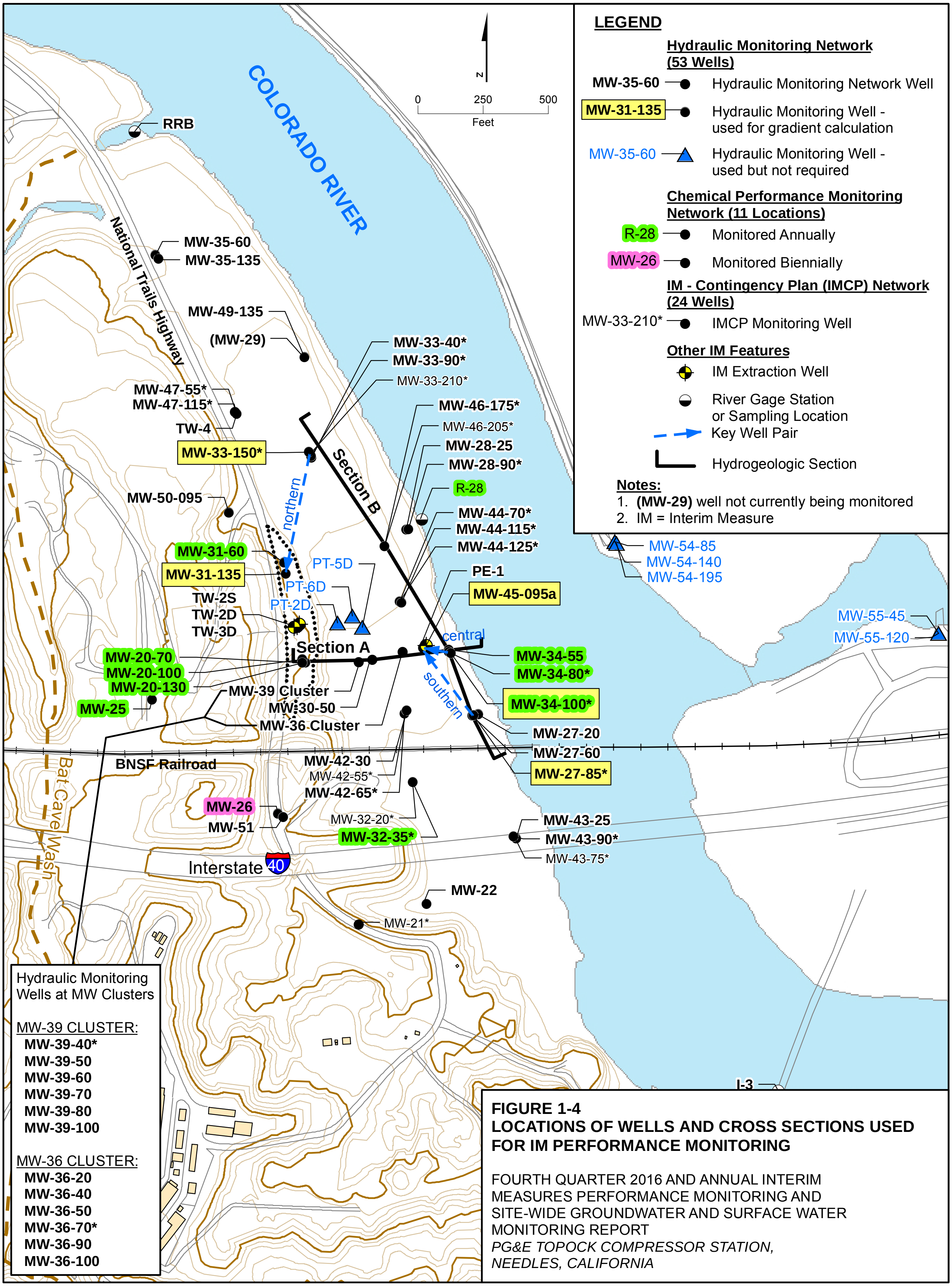
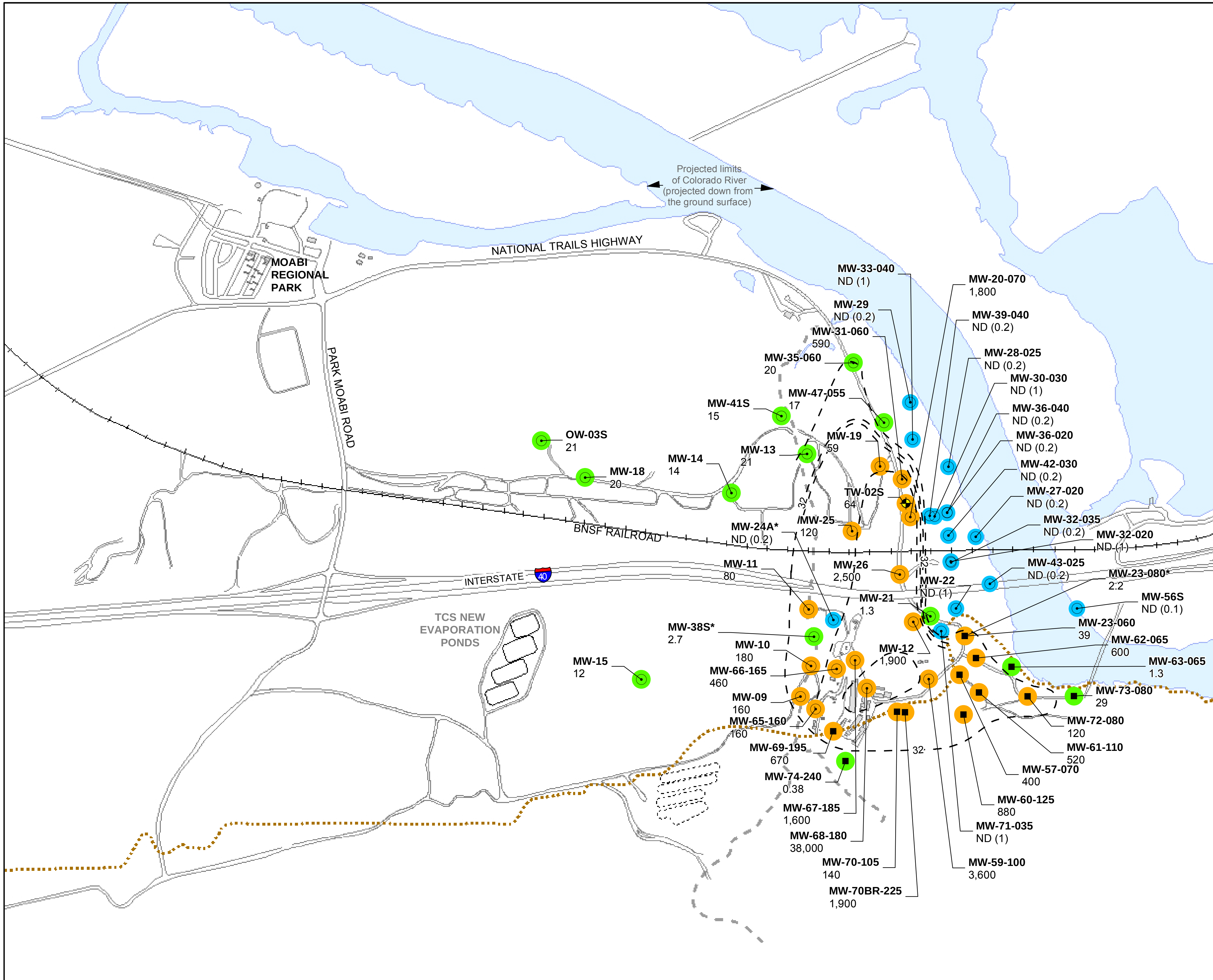


FIGURE 1-4
LOCATIONS OF WELLS AND CROSS SECTIONS USED FOR IM PERFORMANCE MONITORING

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA



ARCADIS Design & Consultancy for natural and built assets

LEGEND

- Alluvial Aquifer well sampled during sampling event
- Bedrock well sampled during sampling event
- Extraction well sampled during sampling event

Cr(VI) Concentrations

- Not detected at or above the analytical reporting limit
- Concentration between reporting limit and 32 µg/L
- Concentration ≥ 32 µg/L
- Approximate outline of "shallow" wells with Cr(VI) concentrations ≥ 32 µg/L
- Approximate bedrock contact at 455 feet above mean sea level.

MW-23-080 — Sampling Location
2.2 — Groundwater Concentration (µg/L)

Notes:
1. "ND" = Cr(VI) not detected at listed reporting limit.
2. µg/L = micrograms per liter
3. Cr(VI) = Hexavalent Chromium
4. TCS = Topock Compressor Station
5. * = Wells with sampled values < 32 µg/L shown within footprint of 32 µg/L boundary.
6. Results plotted are maximum concentration from primary and duplicate samples, see Table 3-1 for complete results.
7. The 32 µg/L line for Cr(VI) is estimated based on available groundwater sampling, hydrogeologic and geochemical data.
8. Long-screened wells and wells screened across more than one depth interval are generally not posted on this map. See Table 3-1 for complete results.

N

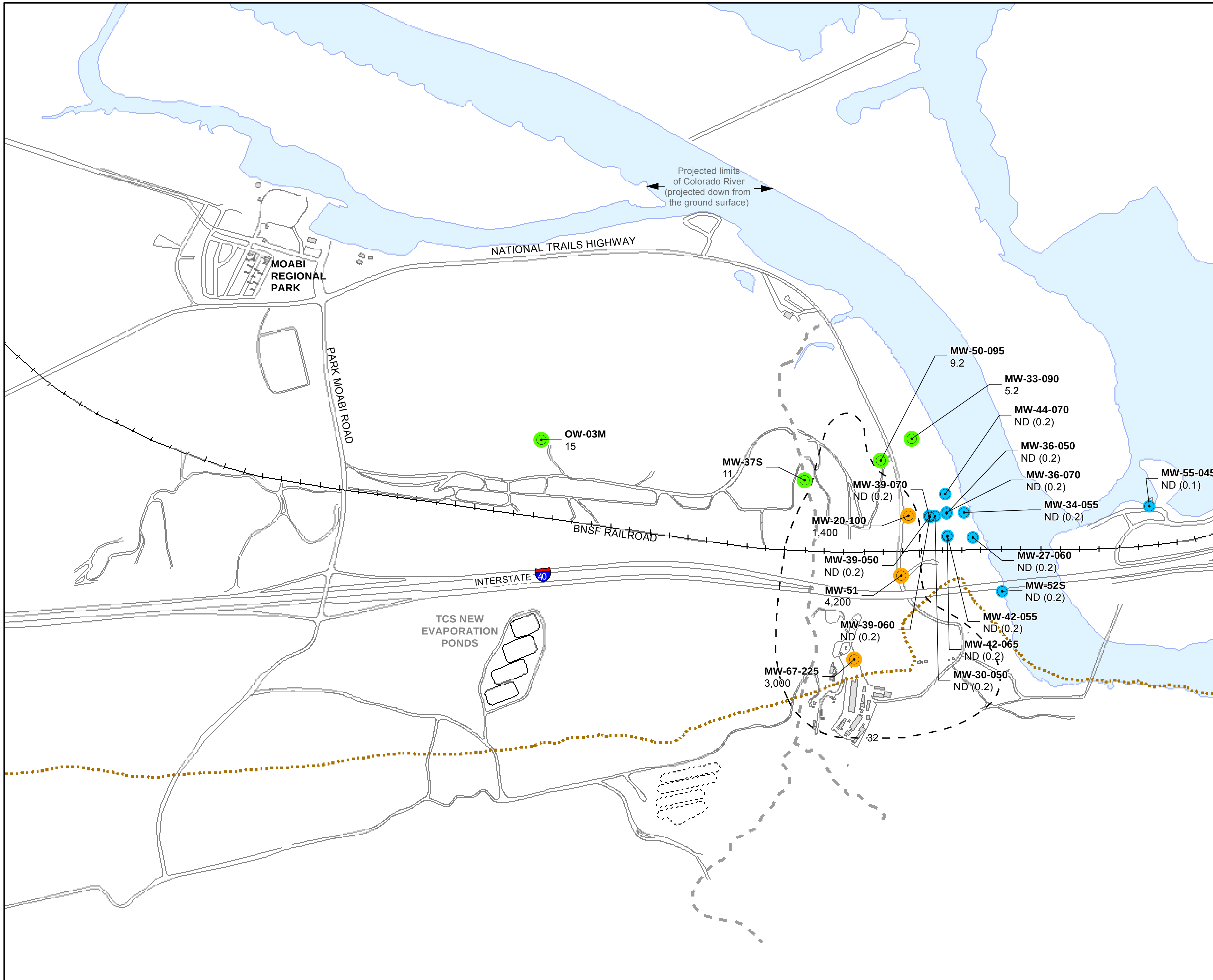
0 500 1,000
Feet

FIGURE 3-1a
Cr(VI) SAMPLING RESULTS, SHALLOW WELLS IN ALLUVIAL AQUIFER AND BEDROCK, FOURTH QUARTER 2016

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

Created by: CRITIGEN

R:\GIS\TOPOCKGIS\MAPFILES\2016\GMP\2016Q4\FIGURE3-1A_CRVI_SHALLOW_2016Q4.MXD KDOLAN 3/14/2017 11:47:30 AM



ARCADIS Design & Consultancy for natural and built assets

LEGEND

Alluvial Aquifer well sampled during sampling event

Cr(VI) Concentrations

- Not detected at or above the analytical reporting limit
- Concentration between reporting limit and 32 µg/L
- Concentration ≥ 32 µg/L
- Approximate outline of "mid-depth" wells with Cr(VI) concentrations ≥ 32 µg/L
- Approximate bedrock contact at 425 feet above mean sea level.

MW-20-100 — Sampling Location
1,400 — Groundwater Concentration (µg/L)

Notes:
1. "ND" = Cr(VI) not detected at listed reporting limit.
2. µg/L = micrograms per liter
3. Cr(VI) = Hexavalent Chromium
4. Results plotted are maximum concentration from primary and duplicate samples, see Table 3-1 for complete results.
5. Long-screened wells and wells screened across more than one depth interval are generally not posted on this map. See Table 3-1 for complete results.
6. TCS = Topock Compressor Station
7. The 32 µg/L line for Cr(VI) is estimated based on available groundwater sampling, hydrogeologic and geochemical data.

N

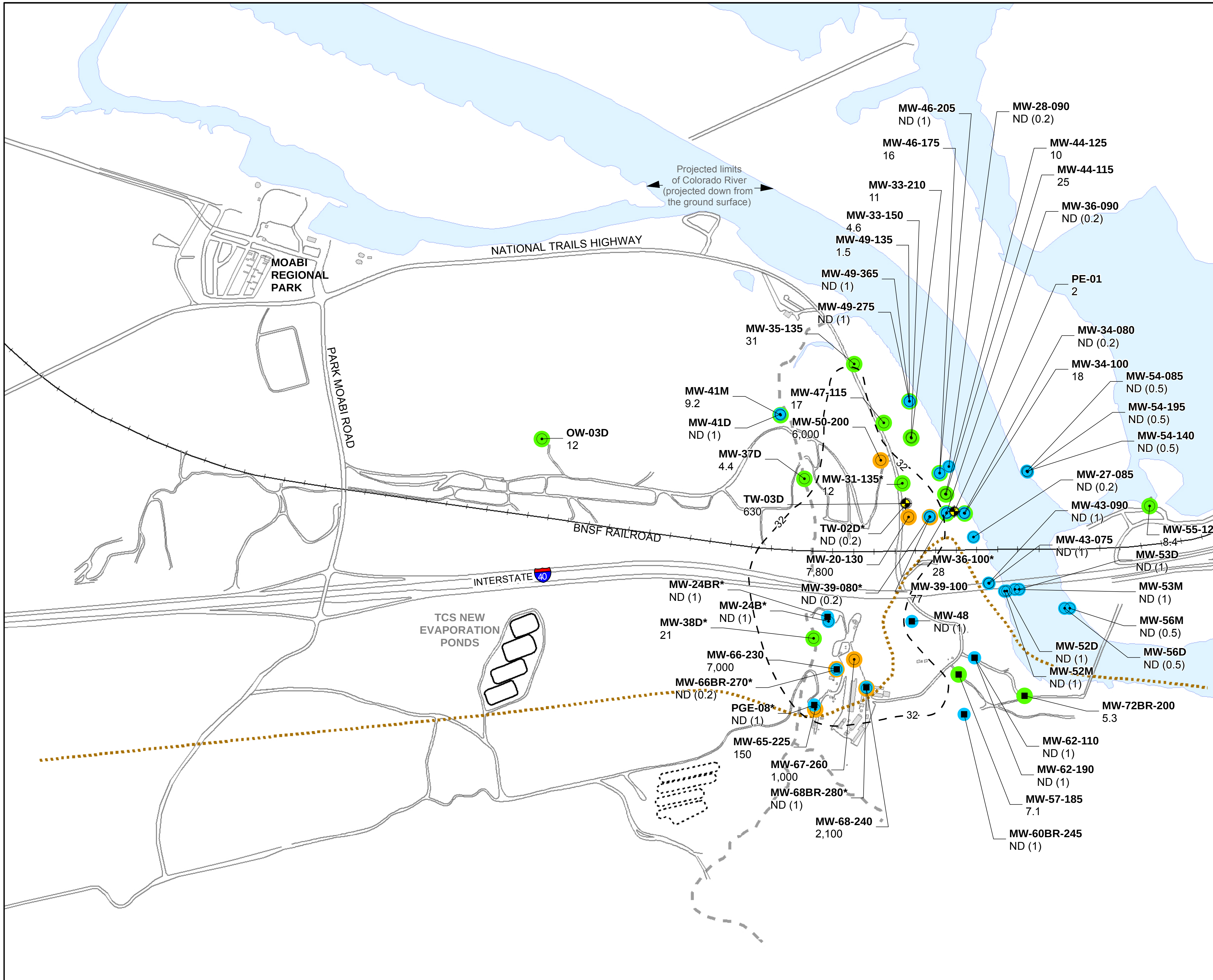
0 500 1,000
Feet

FIGURE 3-1b
Cr(VI) SAMPLING RESULTS, MID-DEPTH WELLS IN ALLUVIAL AQUIFER AND BEDROCK, FOURTH QUARTER 2016

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

Created by: CRITIGEN

R:\GIS\TOPOCKGIS\MAPFILES\2016\GMP\2016Q4\FIGURE3-1B_CRVI_MIDDLE_2016Q4.MXD KDOLAN 2/13/2017 2:02:15 PM



R:\GIS\TOPOCKGIS\MAPFILES\2016\GMP\2016Q4\FIGURE3-1C_CRVI_DEEP_2016Q4.MXD KDOLAN 2/20/2017 7:44:21 PM

ARCADIS Design & Consultancy for natural and built assets

LEGEND

- Alluvial Aquifer well sampled during sampling event
- Bedrock well sampled during sampling event
- Extraction well sampled during sampling event

Cr(VI) Concentrations

- Not detected at or above the analytical reporting limit
- Concentration between reporting limit and 32 µg/L
- Concentration ≥ 32 µg/L
- Approximate outline of "deep" wells with Cr(VI) concentrations ≥ 32 µg/L
- Approximate bedrock contact at 395 feet above mean sea level.

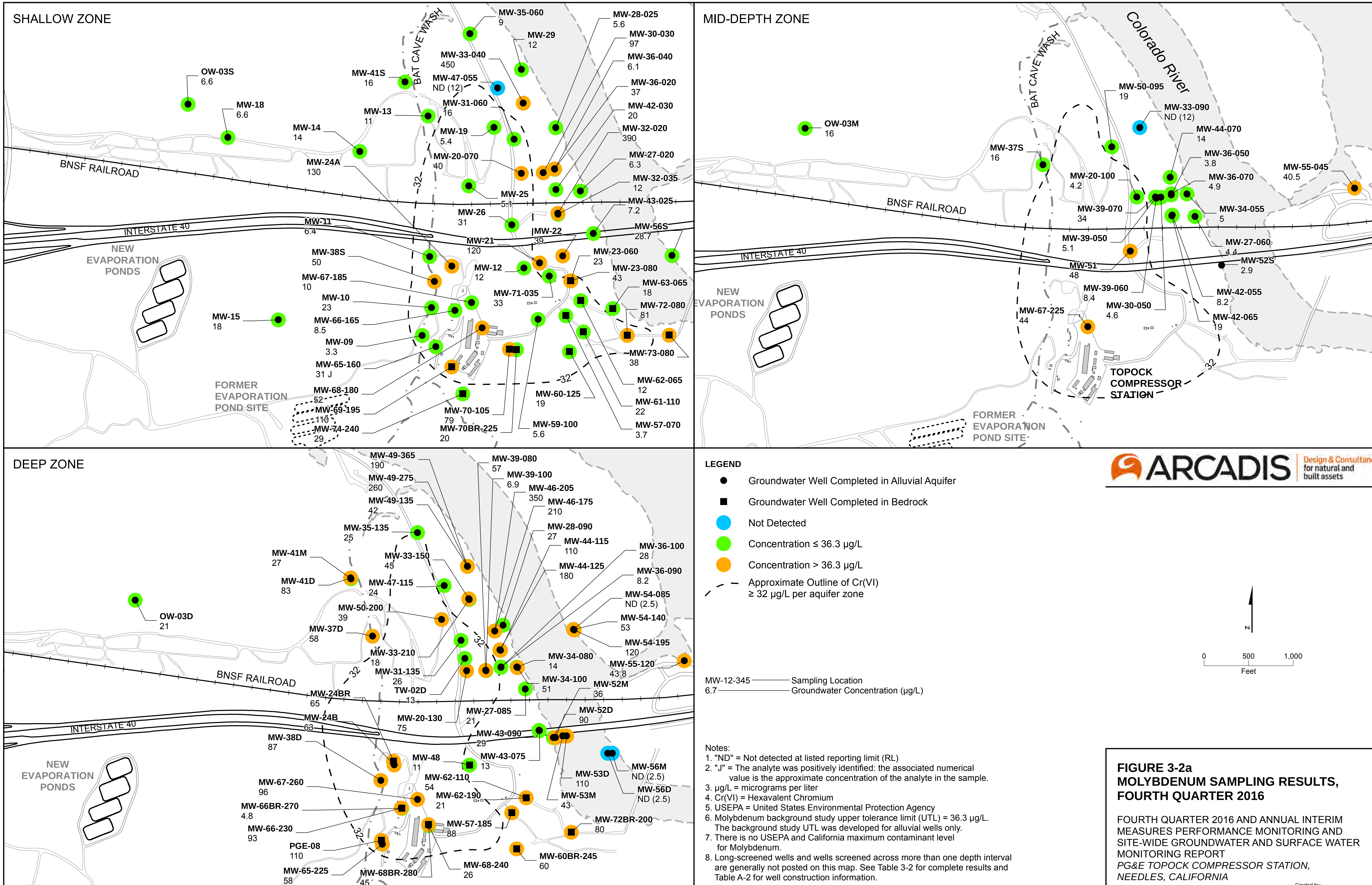
MW-31-135 — Sampling Location
12 — Groundwater Concentration (µg/L)

Notes:
1. "ND" = Cr(VI) not detected at listed reporting limit.
2. µg/L = micrograms per liter
3. Cr(VI) = Hexavalent Chromium
4. * = Wells with sampled values < 32 µg/L shown within footprint of 32 µg/L boundary.
5. Results plotted are maximum concentration from primary and duplicate samples, see Table 3-1 for complete results.
6. The 32 µg/L line for Cr(VI) is estimated based on available groundwater sampling, hydrogeologic and geochemical data. There are no data confirming the existence of Cr(VI) under the Colorado River.
7. Long-screened wells and wells screened across more than one depth interval are generally not posted on this map. See Table 3-1 for complete results.
8. TCS = Topock Compressor Station

FIGURE 3-1c
Cr(VI) SAMPLING RESULTS, DEEP WELLS IN ALLUVIAL AQUIFER AND BEDROCK, FOURTH QUARTER 2016

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

Created by: CRITIGEN



LEGEND

- Groundwater Well Completed in Alluvial Aquifer
- Groundwater Well Completed in Bedrock
- Not Detected
- Concentration ≤ 36.3 µg/L
- Concentration > 36.3 µg/L
- Approximate Outline of Cr(VI) ≥ 32 µg/L per aquifer zone

MW-12-345 — Sampling Location
6.7 — Groundwater Concentration (µg/L)

Notes:
1. "ND" = Not detected at listed reporting limit (RL)
2. "J" = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
3. µg/L = micrograms per liter
4. Cr(VI) = Hexavalent Chromium
5. USEPA = United States Environmental Protection Agency
6. Molybdenum background study upper tolerance limit (UTL) = 36.3 µg/L. The background study UTL was developed for alluvial wells only.
7. There is no USEPA and California maximum contaminant level for Molybdenum.
8. Long-screened wells and wells screened across more than one depth interval are generally not posted on this map. See Table 3-2 for complete results and Table A-2 for well construction information.

ARCADIS Design & Consultancy for natural and built assets

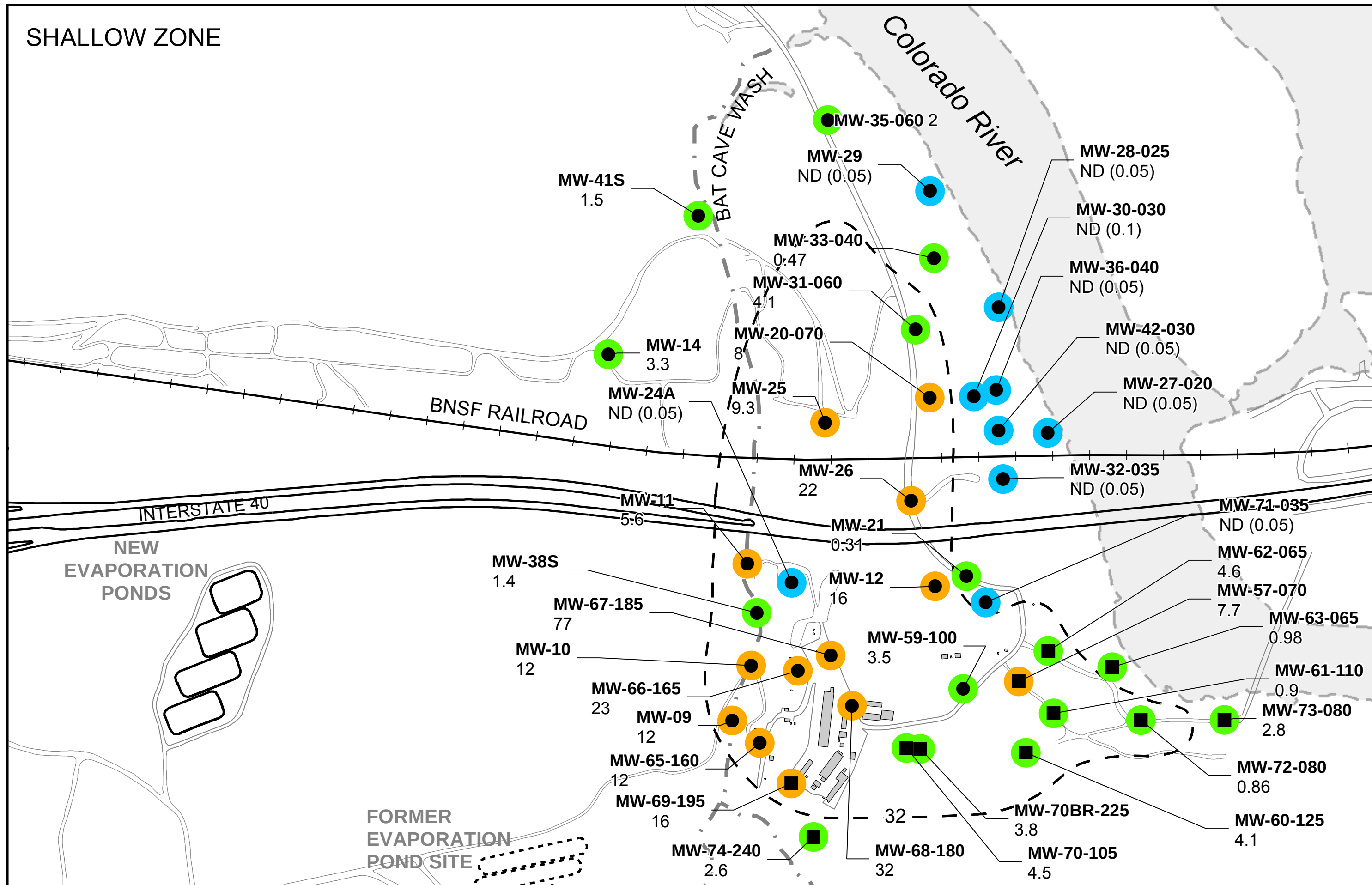
FIGURE 3-2a
MOLYBDENUM SAMPLING RESULTS, FOURTH QUARTER 2016

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

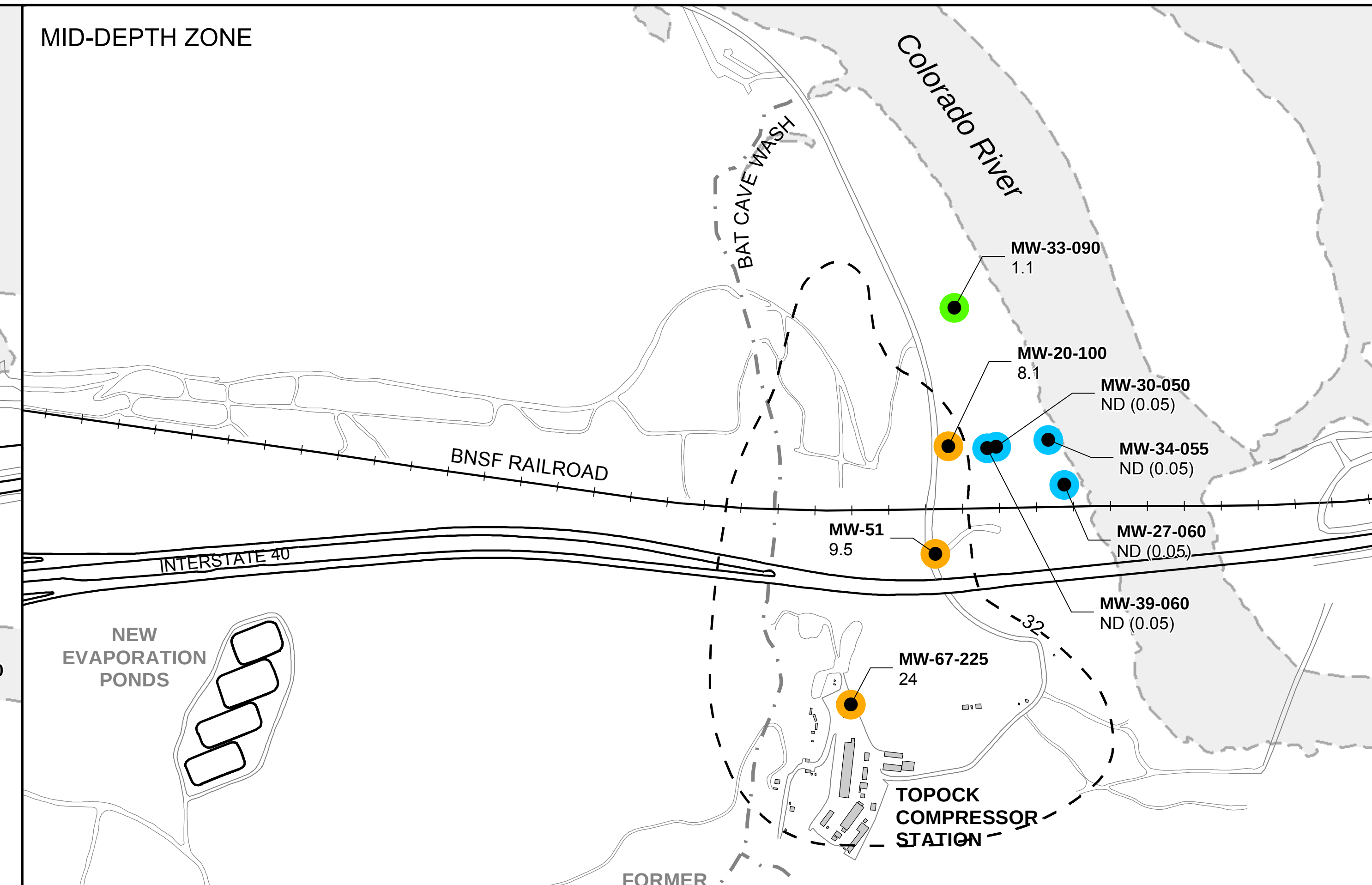
Created by: CRITIGEN

R:\GIS\TOPOCKGIS\MAPFILES\2016\GMP\2016Q4\FIGURE3-2A_2016Q4_ANALYTES_MOLYBDENUM.MXD 2/20/2017 7:45:11 PM

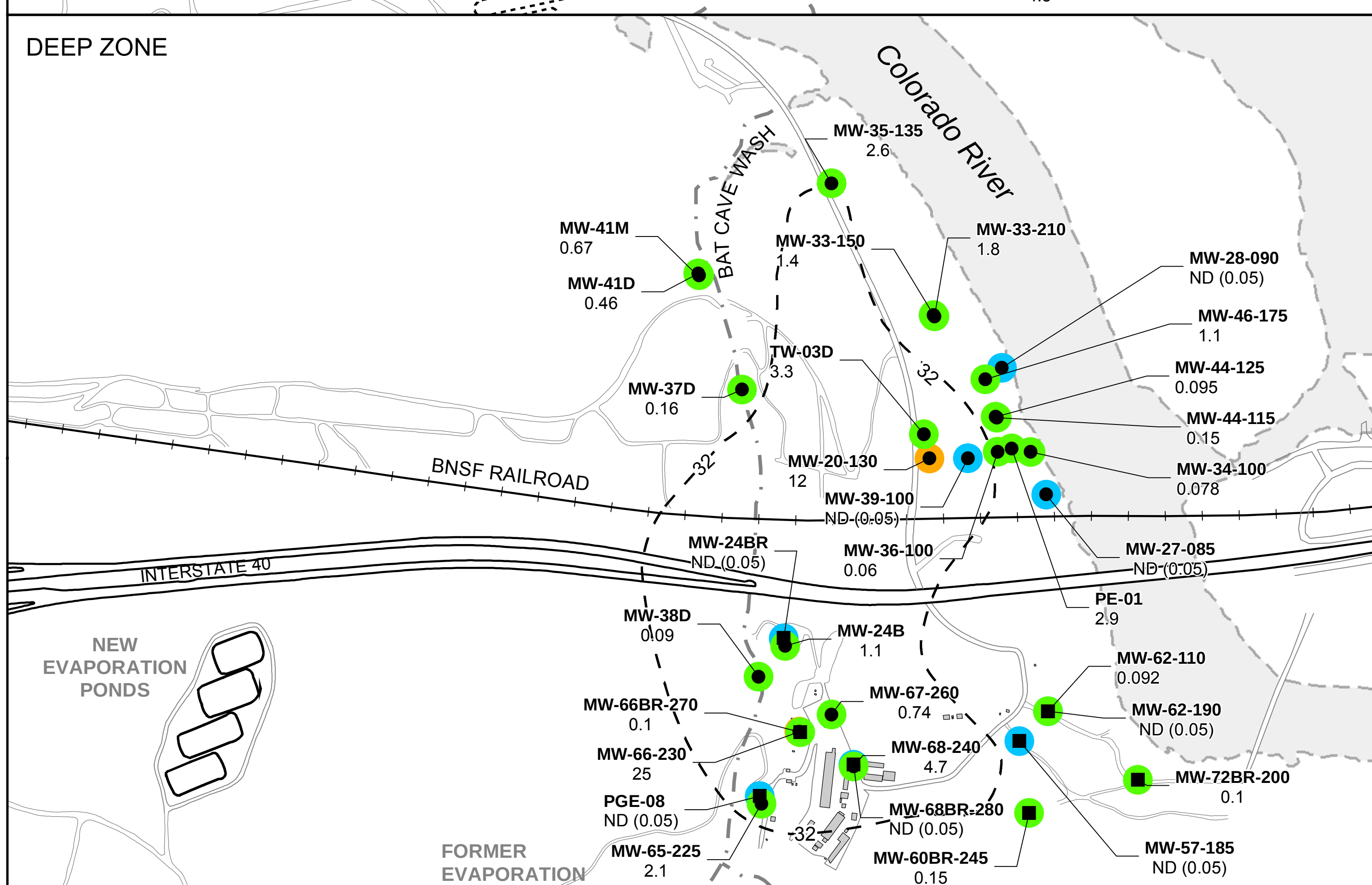
SHALLOW ZONE



MID-DEPTH ZONE



DEEP ZONE



LEGEND

- ● Groundwater Well Completed in Alluvial Aquifer
- ■ Groundwater Well Completed in Bedrock
- Not Detected (blue)
- Concentration ≤ 5.03 mg/L (green)
- Concentration > 5.03 mg/L (orange)
- - - Approximate Outline of Cr(VI) ≥ 32 µg/L per aquifer zone

MW-12-345 — Sampling Location
6.7 — Groundwater Concentration (mg/L)

N

0 500 1,000
Feet

ARCADIS Design & Consultancy for natural and built assets

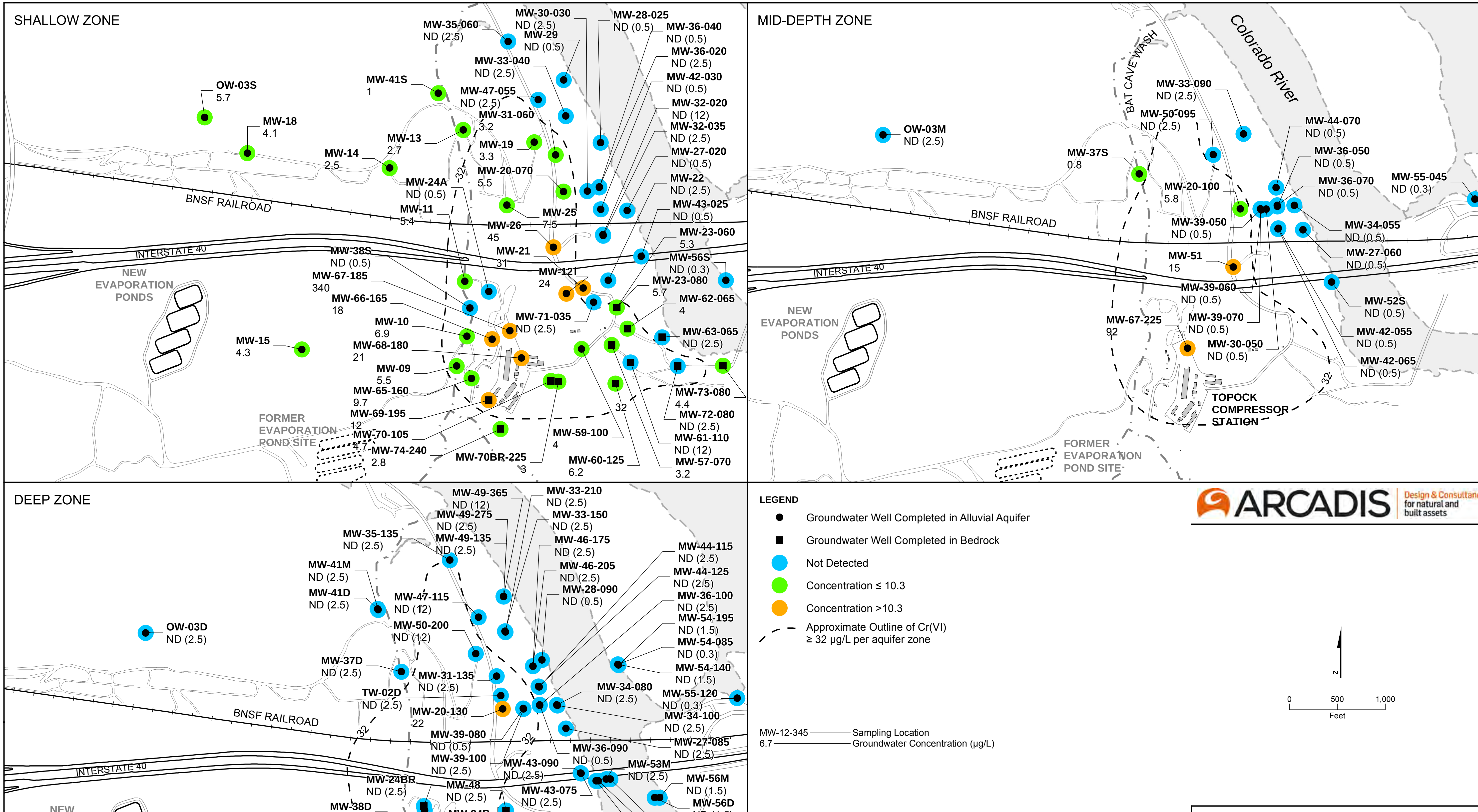
Notes:
1. "ND" = Not detected at listed reporting limit (RL)
2. "J" = The analyte was positively identified: the associated numerical value is the approximate concentration of the analyte in the sample.
3. mg/L = Milligram per liter
4. Cr(VI) = Hexavalent Chromium
5. USEPA = United States Environmental Protection Agency
6. Nitrate background study upper tolerance limit (UTL) = 5.03 mg/L. The background study UTL was developed for alluvial wells only.
7. There is no USEPA and California maximum contaminant level for Nitrate.
8. Long-screened wells and wells screened across more than one depth interval are generally not posted on this map. See Table 3-2 for complete results and Table A-2 for well construction information.

FIGURE 3-2b
NITRATE SAMPLING RESULTS, FOURTH QUARTER 2016

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

Created by: CRITIGEN

R:\GIS\TOPOCKGIS\MAPFILES\2016\GMP\2016Q4\FIGURE3-2B_2016Q4_ANALYTES_NITRATE.MXD 2/16/2017 9:02:06 AM



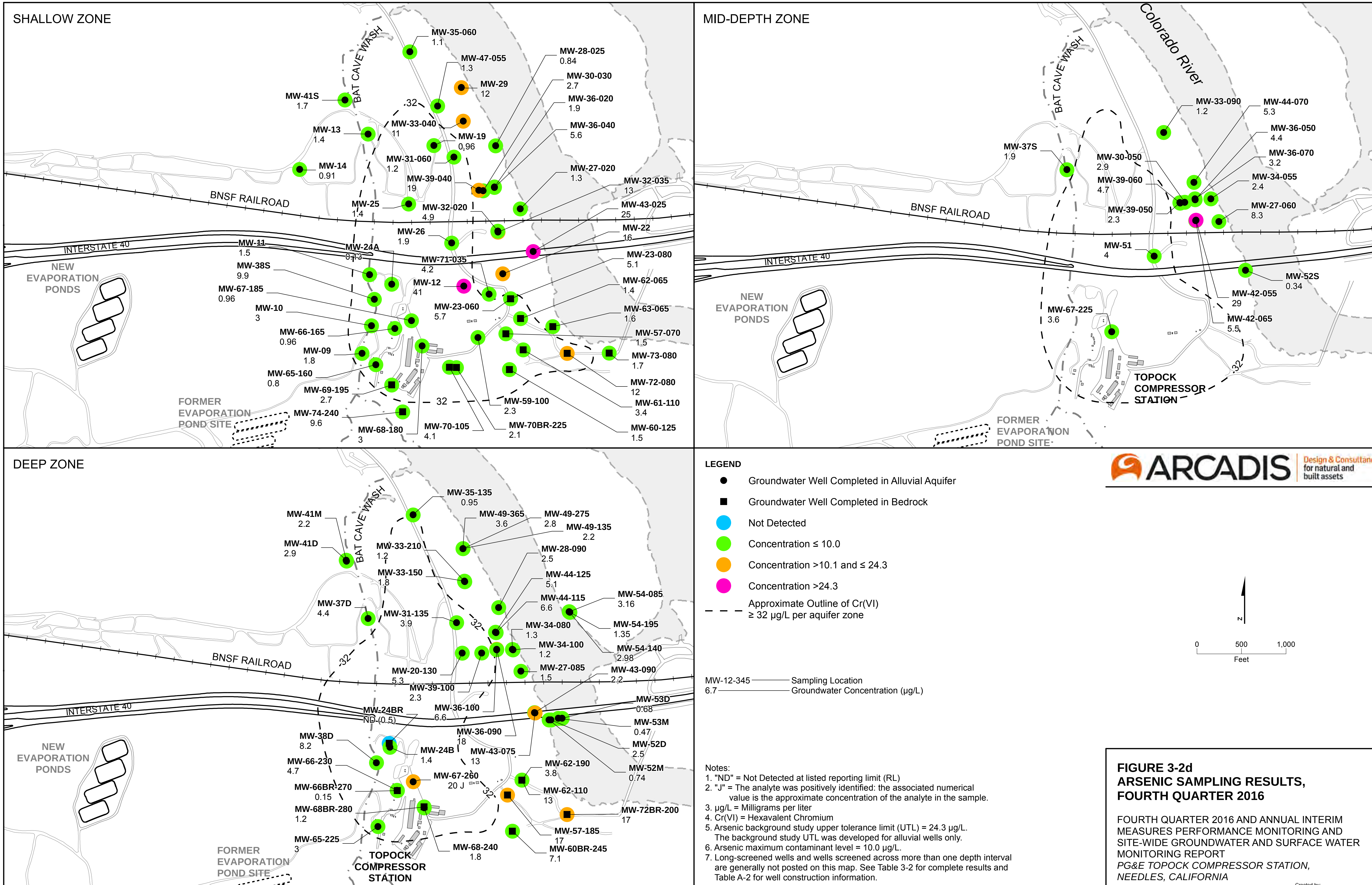
Notes:
1. "ND" = Not Detected at listed reporting limit (RL)
2. "J" = The analyte was positively identified: the associated numerical value is the approximate concentration of the analyte in the sample.
3. µg/L = Milligrams per liter
4. Cr(VI) = Hexavalent Chromium
5. Selenium background study upper tolerance limit (UTL) = 10.3 µg/L
The background study UTL was developed for alluvial wells only.
6. Selenium applicable or relavant and appropriate requirement (ARAR) = 50.0 µg/L
7. Long-screened wells and wells screened across more than one depth interval are generally not posted on this map. See Table 3-2 for complete results and Table A-2 for well construction information.

FIGURE 3-2c
SELENIUM SAMPLING RESULTS, FOURTH QUARTER 2016

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

Created by: CRITIGEN

R:\GIS\TOPOCKGIS\MAPFILES\2016\GMP\2016Q4\FIGURE3-2C_2016Q4_ANALYTES_SELENIUM.MXD 2/20/2017 7:46:15 PM



LEGEND

- ● Groundwater Well Completed in Alluvial Aquifer
- ■ Groundwater Well Completed in Bedrock
- Not Detected
- Concentration ≤ 10.0
- Concentration >10.1 and ≤ 24.3
- Concentration >24.3
- Approximate Outline of Cr(VI) ≥ 32 µg/L per aquifer zone

MW-12-345 — Sampling Location
6.7 — Groundwater Concentration (µg/L)

ARCADIS Design & Consultancy for natural and built assets

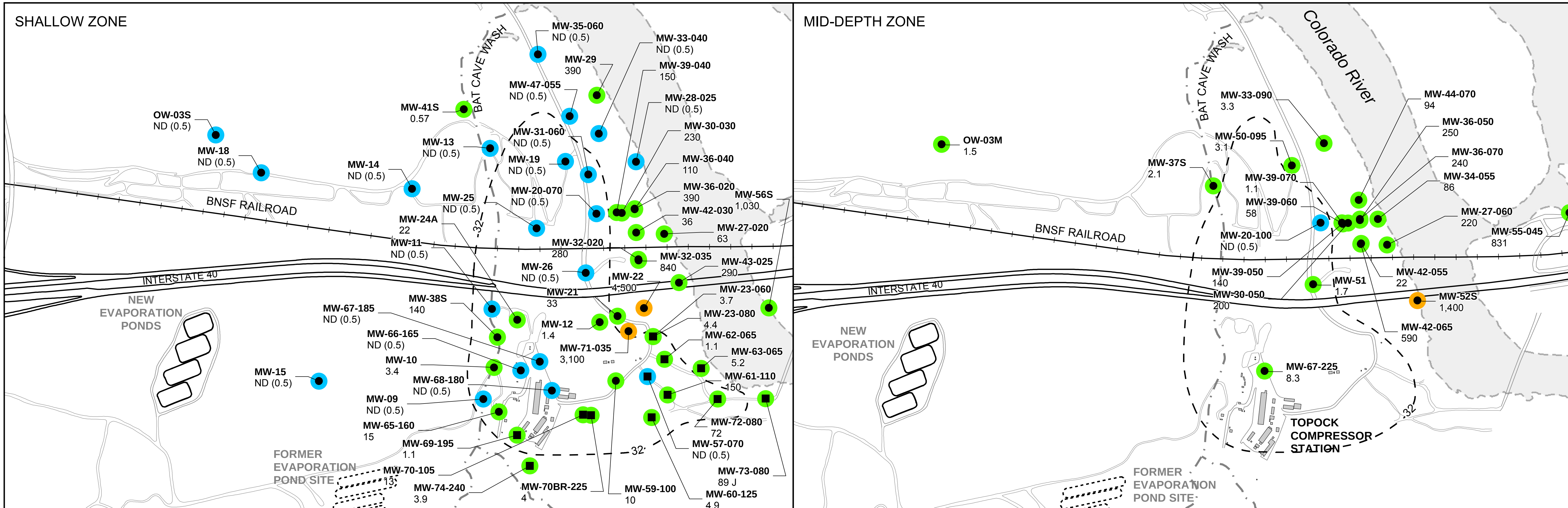
Notes:
1. "ND" = Not Detected at listed reporting limit (RL)
2. "J" = The analyte was positively identified: the associated numerical value is the approximate concentration of the analyte in the sample.
3. µg/L = Milligrams per liter
4. Cr(VI) = Hexavalent Chromium
5. Arsenic background study upper tolerance limit (UTL) = 24.3 µg/L. The background study UTL was developed for alluvial wells only.
6. Arsenic maximum contaminant level = 10.0 µg/L.
7. Long-screened wells and wells screened across more than one depth interval are generally not posted on this map. See Table 3-2 for complete results and Table A-2 for well construction information.

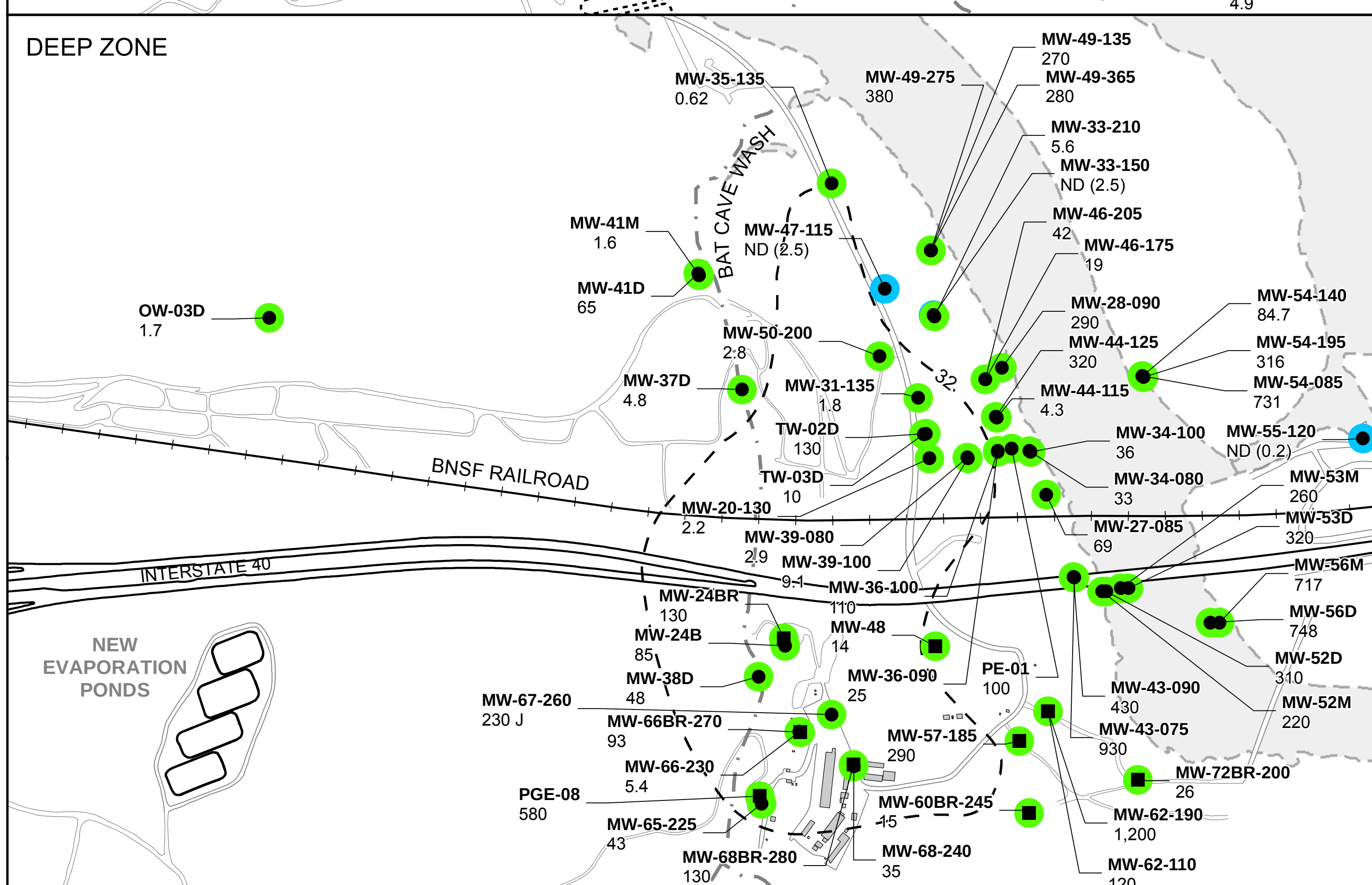
FIGURE 3-2d
ARSENIC SAMPLING RESULTS, FOURTH QUARTER 2016

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

Created by: CRITIGEN

R:\GIS\TOPOCKGIS\MAPFILES\2016\GMP\2016Q4\FIGURE3-2D_2016Q4_ANALYTES_ARSENIC.MXD 2/20/2017 7:47:04 PM





LEGEND

- ● Groundwater Well Completed in Alluvial Aquifer
- ■ Groundwater Well Completed in Bedrock
- Not detected at analytical reporting limit
- Concentration ≤ 1,320
- Concentration > 1,320
- Approximate Outline of Cr(VI) ≥ 32 µg/L per aquifer zone

MW-12-345 — Sampling Location
6.7 — Groundwater Concentration (µg/L)

N

0 500 1,000
Feet

ARCADIS Design & Consultancy for natural and built assets

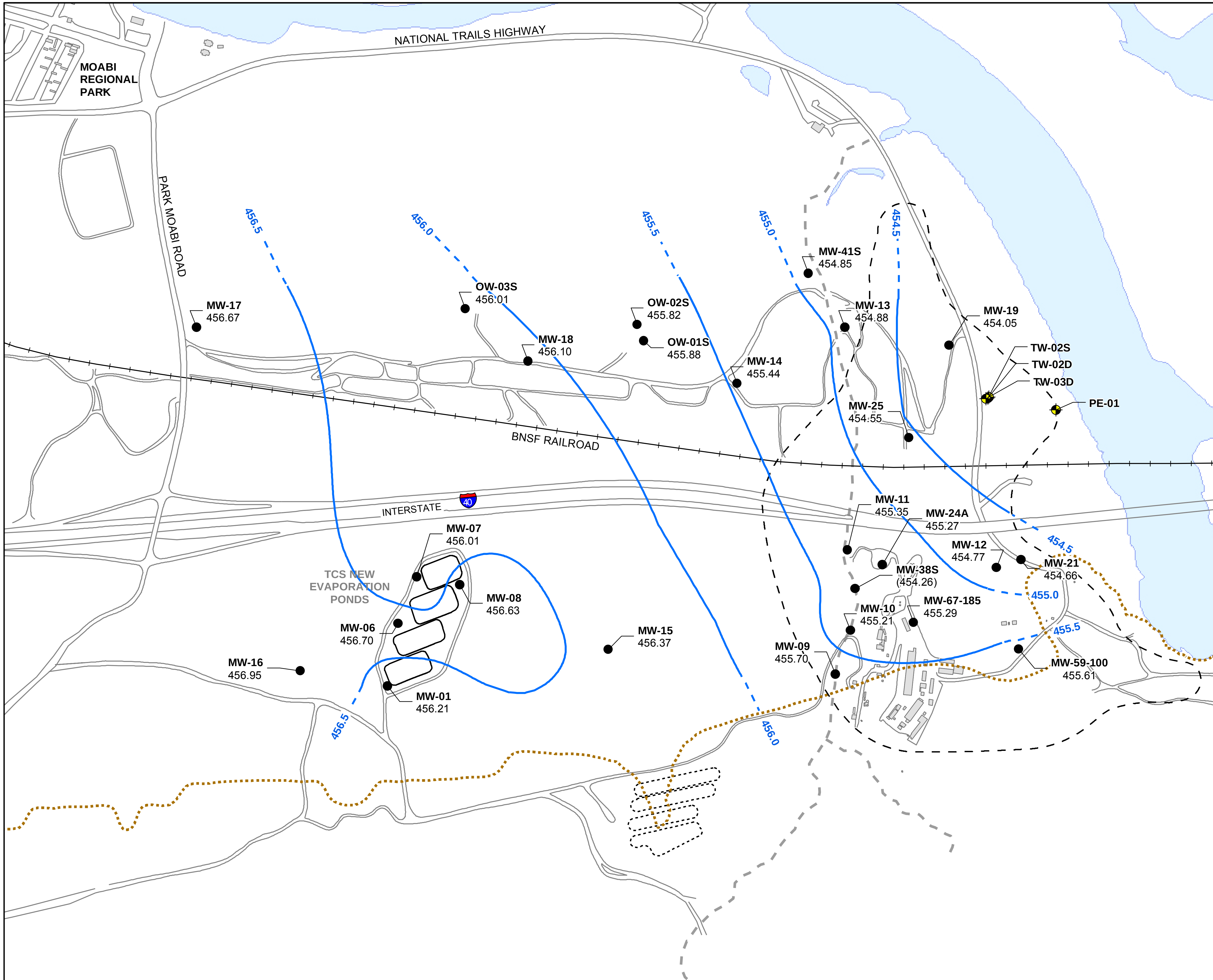
Notes:
1. "ND" = Not Detected at listed reporting limit (RL)
2. "J" = The analyte was positively identified: the associated numerical value is the approximate concentration of the analyte in the sample.
3. µg/L = Milligrams per liter
4. Cr(VI) = Hexavalent Chromium
5. USEPA = United States Environmental Protection Agency
6. Manganese background study report upper tolerance limit (UTL) = 1,320 µg/L. The background study UTL was developed for alluvial wells only.
7. There is no primary USEPA and California maximum contaminant level (MCL) for Manganese. The secondary MCL is 50 µg/L.
8. Long-screened wells and wells screened across more than one depth interval are generally not posted on this map. See Table 3-2 for complete results and Table A-2 for well construction information.

FIGURE 3-2e
MANGANESE SAMPLING RESULTS, FOURTH QUARTER 2016

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

Created by: CRITIGEN

R:\GIS\TOPOCKGIS\MAPFILES\2016\GMP\2016Q4\FIGURE3-2E_2016Q4_ANALYTES_MANGANESE.MXD 2/20/2017 7:47:42 PM



R:\GIS\TOPOCKGIS\MAPFILES\2016\GMP\2016Q4\FIGURE3-3_GWE_SNAPSHOTPLOT_2016Q4.MXD 3/14/2017 12:45:46 PM

ARCADIS Design & Consultancy for natural and built assets

LEGEND

- Alluvial Aquifer well sampled during sampling event
- Extraction Well (TW-03D and PE-01 are primary extraction wells; TW-02S and TW-02D are backup extraction wells)
- Groundwater Elevation Contour 0.5 ft, dashed where inferred
- Approximate outline of monitoring wells in Alluvial Aquifer and Bedrock with Cr(VI) concentrations ≥ 32 µg/L
- Approximate bedrock contact at 455 ft AMSL

MW-14 —— Sampling Location
455.51 —— Groundwater Elevation (ft AMSL)
(454.26) —— Groundwater Elevation not used in contouring (ft AMSL)

Notes:
1. Water level contours for the floodplain area are presented in IM Performance Monitoring Reports.
2. Extraction wells TW-03D and PE-01 are pumping from lower portion of the aquifer.
3. Gradients shown on this figure show transient conditions in the aquifer at the time of measurement and may not reflect the expected average groundwater flow directions.
4. AMSL = Above Mean Sea Level
5. ft = Feet

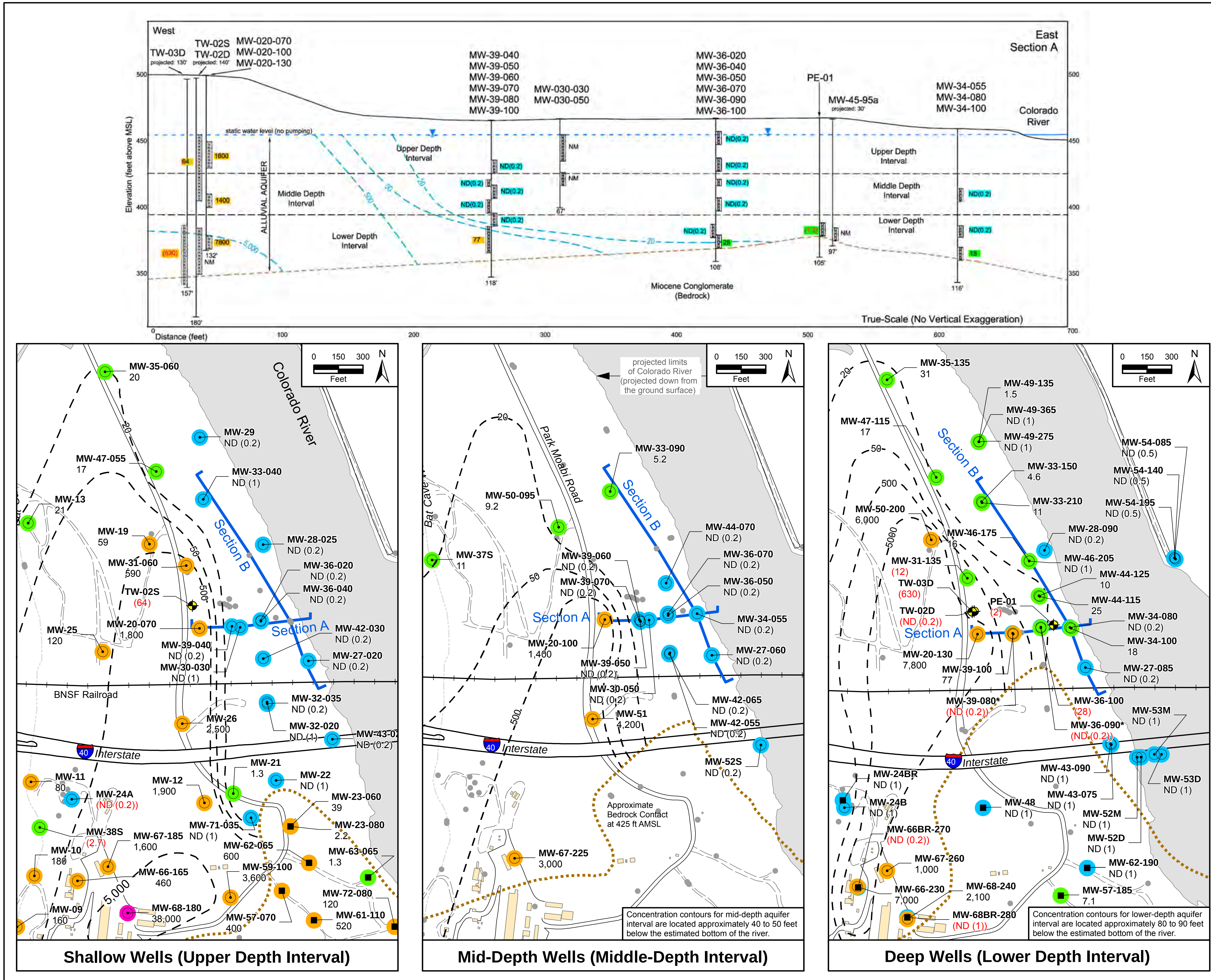
N

0 500 1,000
Feet

FIGURE 3-3
GROUNDWATER ELEVATION MAP SHALLOW ZONE OF THE ALLUVIAL AQUIFER (WATER TABLE), DECEMBER 9, 2016

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

Created by: CRITIGEN



ARCADIS Design & Consultancy for natural and built assets

LEGEND

- Alluvial Aquifer well sampled during sampling event
- Bedrock well sampled during sampling event
- Extraction well sampled during sampling event
- Well not sampled during sampling event

Cr(VI) Concentrations

- Not detected at analytical reporting limit or Not Measured (Cross-Section Only)
- Concentration between reporting limit and 32 μg/L
- Concentration ≥ 32 μg/L
- Inferred Cr(VI) concentration contour within Alluvial Aquifer depth interval
- Approximate bedrock contact (per depth interval)
- Hydrogeologic Section

water level

well screen 3,810

boring depth (feet) 103'

MW-31-135 — Sampling Location
12 — Groundwater Concentration (μg/L)
(12) — Groundwater concentration (μg/L) not used for contouring

Notes:

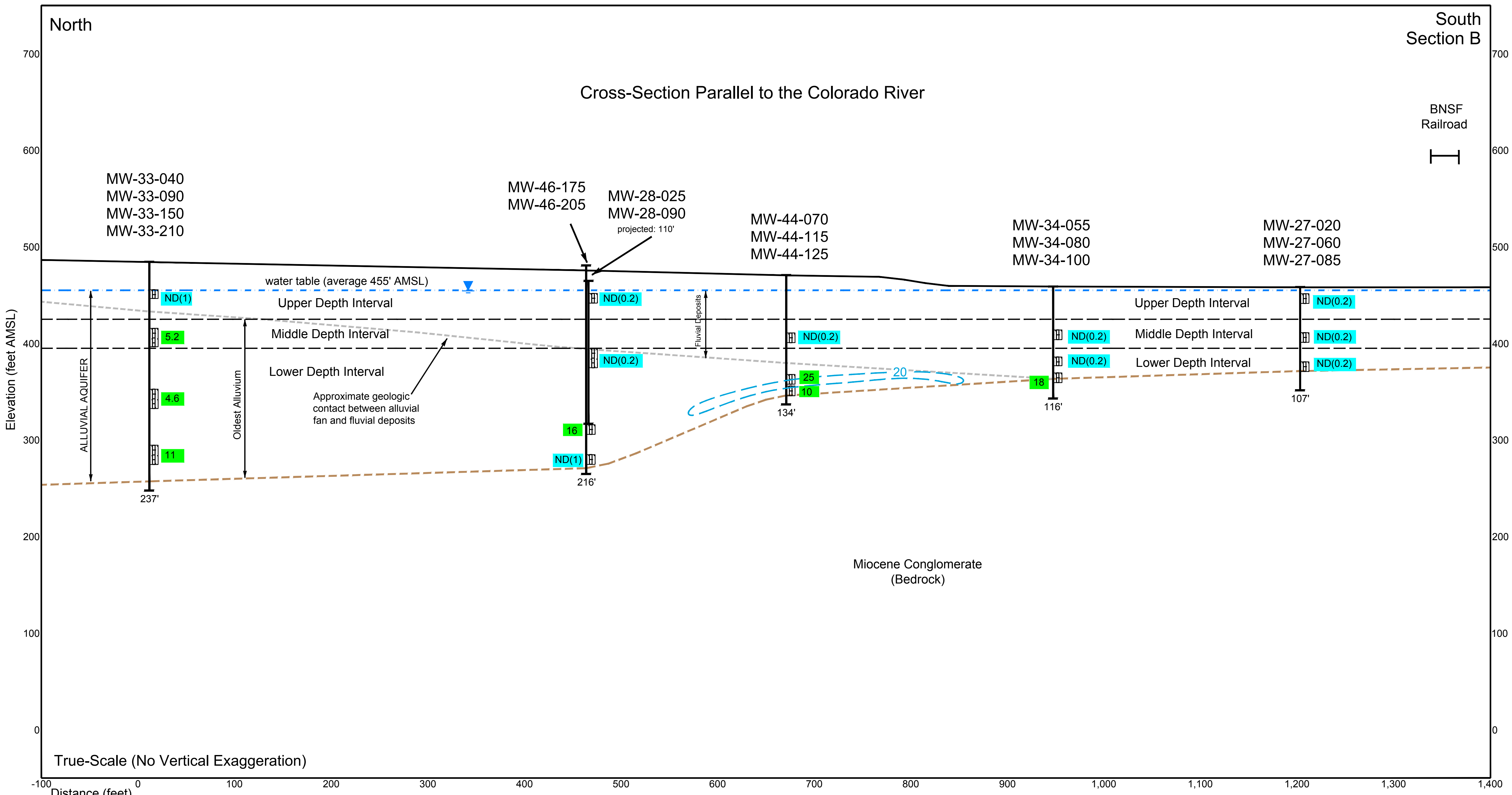
1. "ND" = Cr(VI) not detected at listed reporting limit.
2. "J" = The analyte was positively identified: the associated numerical value is the approximate concentration of the analyte in the sample.
3. " * " = Deep interval "ND" samples screened vertically above detect sample.
4. μg/L = micrograms per liter
5. Cr(VI) = Hexavalent Chromium
6. The Cr(VI) concentration contours of 20 and 50 μg/L are shown in accordance with DTSC's 2005 IM performance monitoring directive. The IM performance standard was established for containment of Cr(VI) concentrations greater than 20 ug/L in the floodplain portion of the Alluvial Aquifer.
7. The 20 and 50 μg/L lines for Cr(VI) are estimated based on available groundwater sampling, hydrogeologic and geochemical data. There are no data confirming the existence of Cr(VI) under the Colorado River.
8. Extraction wells PE-01, TW-02S, TW-02D, and TW-03D are not included in contouring. These wells draw water from a larger area and do not represent Cr(VI) concentrations at their specific locations.
9. Long-screened wells and wells screened across more than one depth interval are generally not posted on this map. See Table 3-1 for complete results.

FIGURE 4-1
CR(VI) CONCENTRATIONS IN ALLUVIAL AQUIFER AND BEDROCK, FOURTH QUARTER 2016

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

Created by: CRITIGEN

BAO R:\GIS\TOPOCKGIS\MAPFILES\2016\GMP\2016Q4\FIGURE4-1_GMP_CR6_2016Q4_MAX.MXD KDOLAN 2/20/2017 7:41:32 PM



Notes:
AMSL = above mean sea level.
NM = not measured.
µg/L = micrograms per liter.
ND = not detected at listed reporting limit

1. See Table 3-1 for additional sampling data and prior results for wells on this figure.

2. See Figure 1-4 for location of this cross-section.

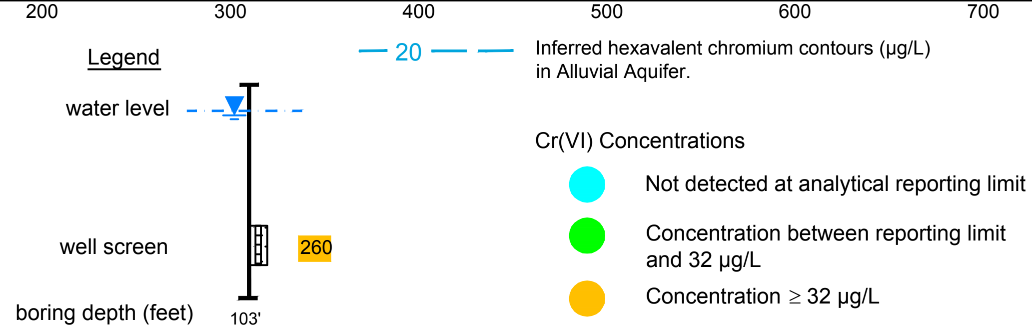
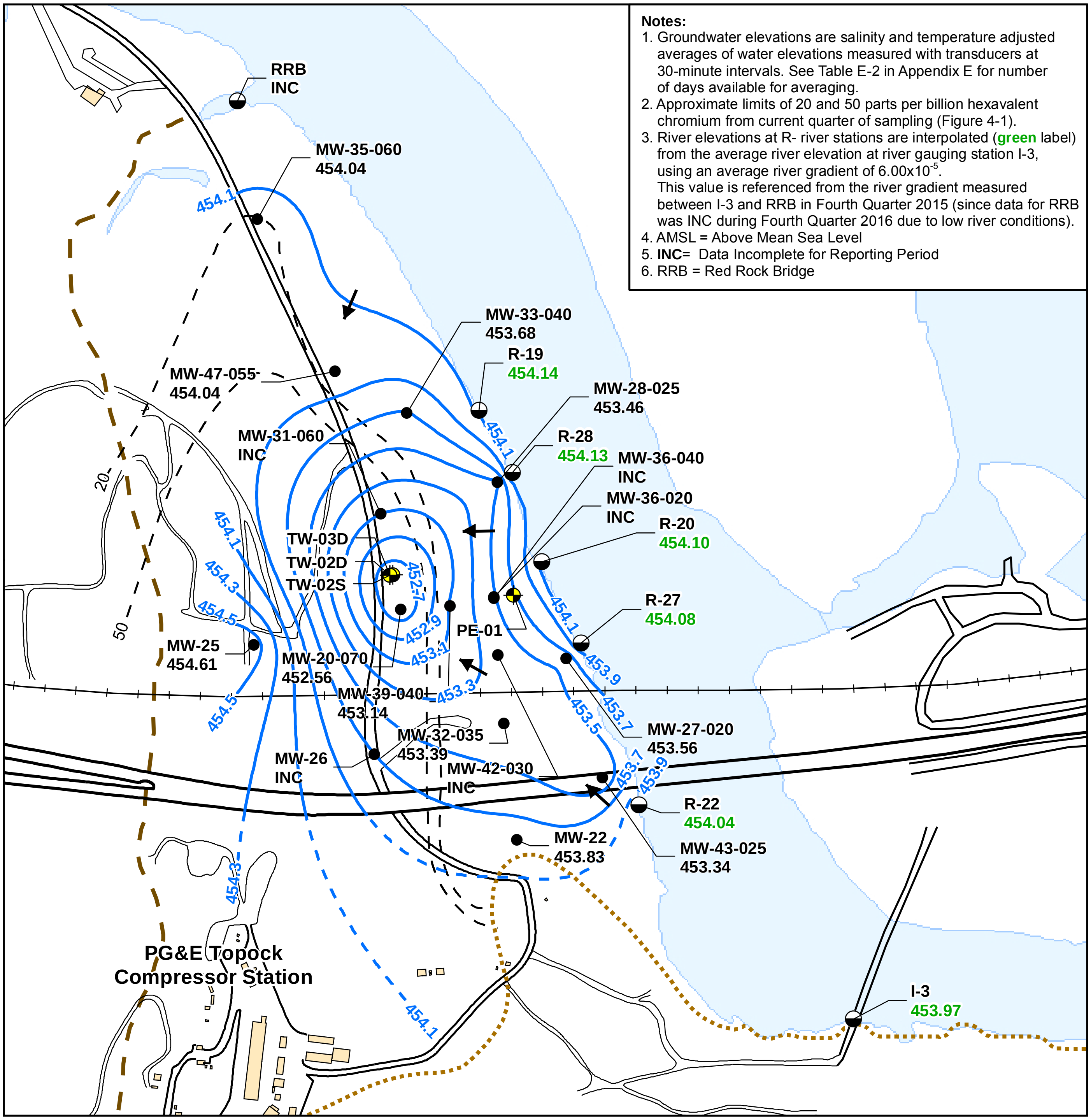


FIGURE 4-2
Cr(VI) CONCENTRATIONS FLOODPLAIN CROSS-SECTION B
FOURTH QUARTER 2016
FOURTH QUARTER 2016 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS



Notes:
1. Groundwater elevations are salinity and temperature adjusted averages of water elevations measured with transducers at 30-minute intervals. See Table E-2 in Appendix E for number of days available for averaging.
2. Approximate limits of 20 and 50 parts per billion hexavalent chromium from current quarter of sampling (Figure 4-1).
3. River elevations at R- river stations are interpolated (**green** label) from the average river elevation at river gauging station I-3, using an average river gradient of 6.00x10^{-5}. This value is referenced from the river gradient measured between I-3 and RRB in Fourth Quarter 2015 (since data for RRB was INC during Fourth Quarter 2016 due to low river conditions).
4. AMSL = Above Mean Sea Level
5. **INC**= Data Incomplete for Reporting Period
6. RRB = Red Rock Bridge

LEGEND

- Monitoring Well
- River Station
- Extraction Well (TW-03D and PE-01 are primary extraction wells; TW-02S and TW-02D are backup extraction wells)
- Bedrock Contact at 455 ft AMSL Elevation
- Interpreted Groundwater Flow Direction
- Groundwater Elevation Contour 0.2 ft (dashed where inferred)
- Inferred Cr(VI) Concentration Contour (see note 2)

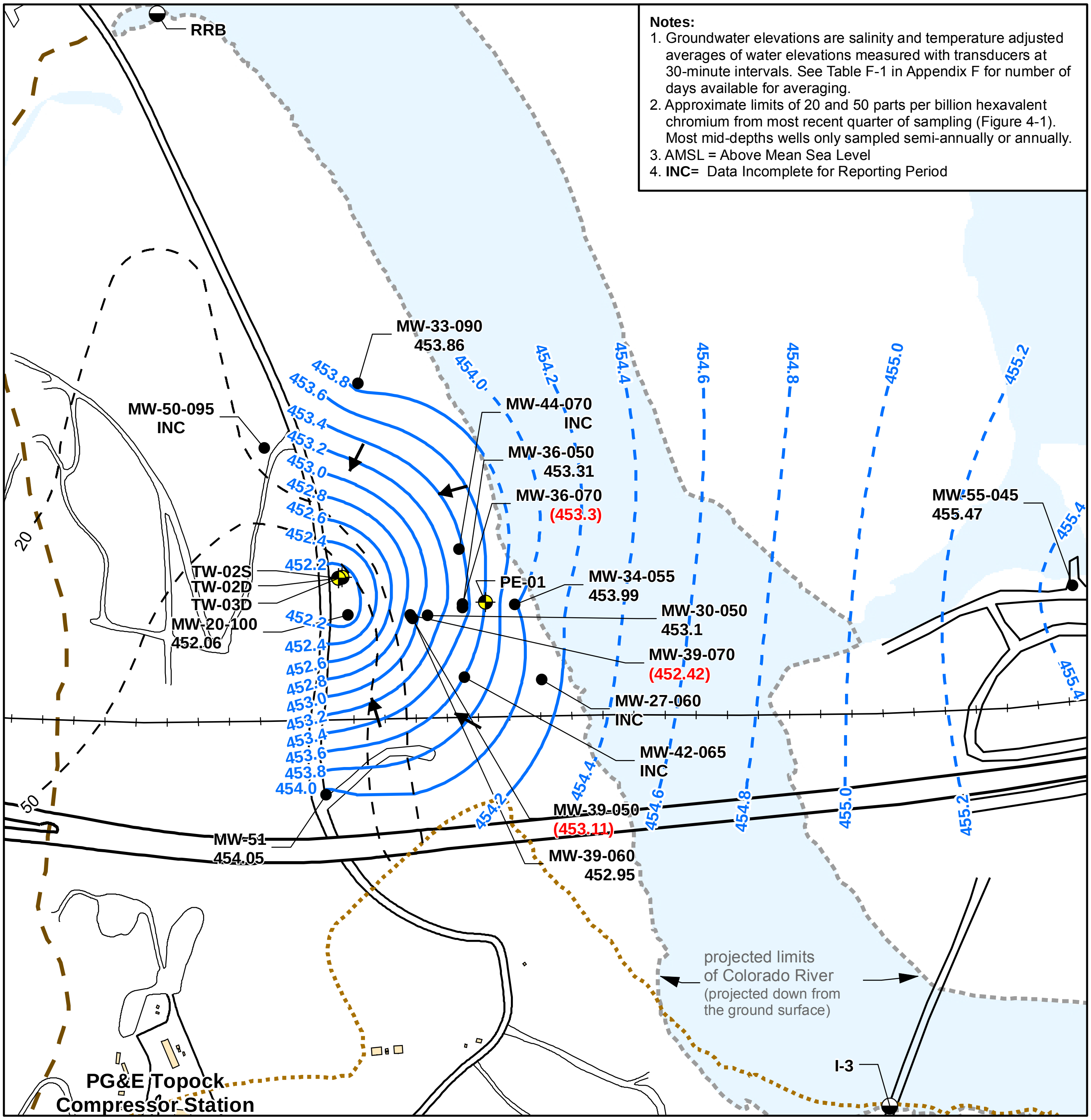
MW-20-070 — Gauging Location
453.11 — Average Groundwater Elevation (ft AMSL)
R-27 — River Station (see note 3)
453.79 — River Elevation (ft AMSL) Interpolated Average

0 300 600
Feet

N

FIGURE 4-3a
AVERAGE GROUNDWATER ELEVATIONS IN SHALLOW WELLS AND RIVER ELEVATIONS, FOURTH QUARTER 2016

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA



LEGEND

- Monitoring Well
- River Station
- Extraction Well (TW-03D and PE-01 are primary extraction wells; TW-02S and TW-02D are backup extraction wells)
- Bedrock Contact at 425 ft AMSL Elevation
- Interpreted Groundwater Flow Direction
- Groundwater Elevation Contour 0.2 ft (dashed where inferred)
- Inferred Cr(VI) Concentration Contour When Sampled (see note 2)

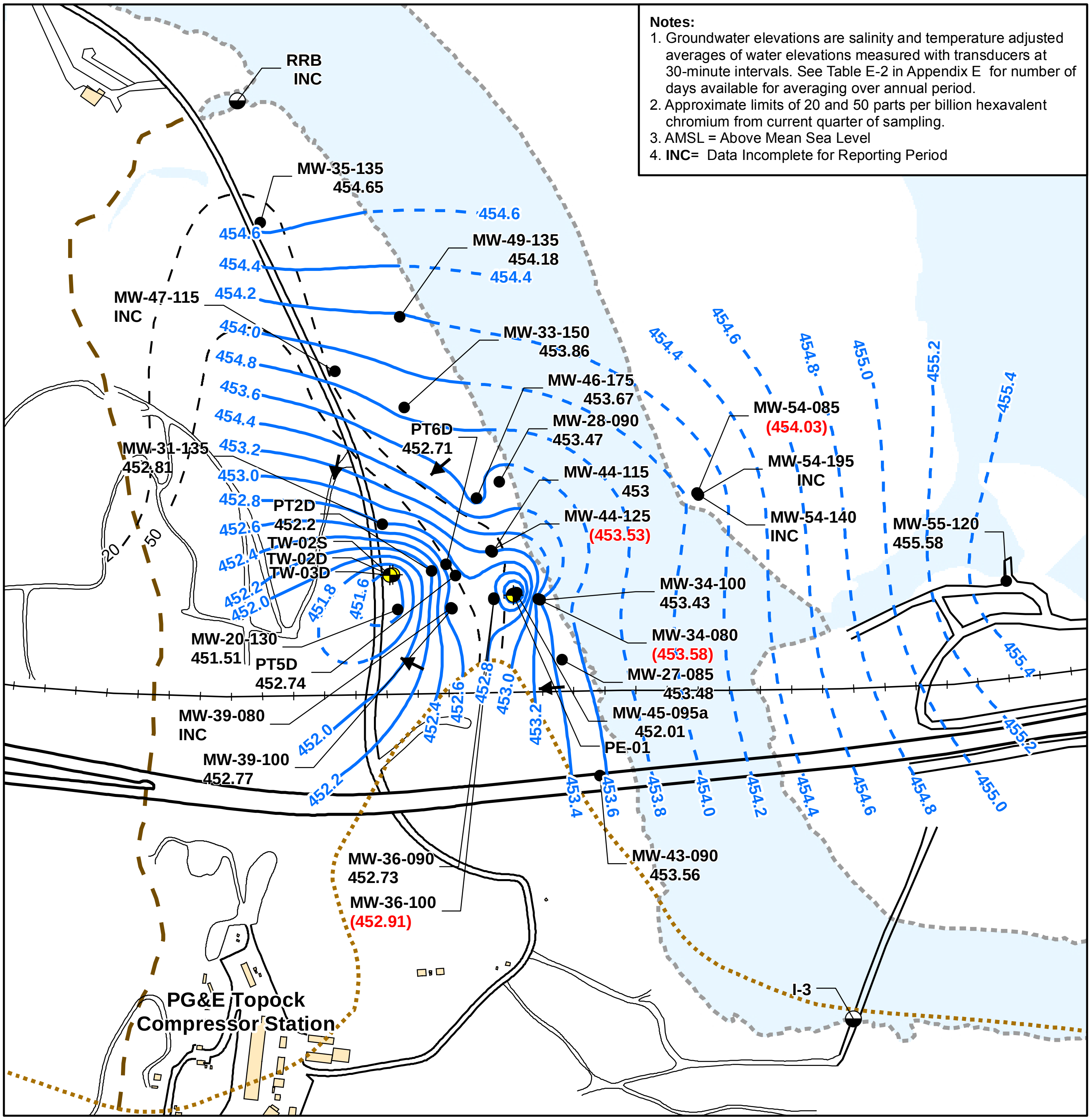
MW-39-060 — Gauging Location
452.95 — Average Groundwater Elevation (ft AMSL)
(453.11) — Elevation in red parentheses not used for contouring

0 250 500
Feet

N

FIGURE 4-3b
AVERAGE GROUNDWATER ELEVATIONS IN MID-DEPTH WELLS, FOURTH QUARTER 2016

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA



LEGEND

- Monitoring Well
- River Station
- Extraction Well — *Extraction Well (TW-03D and PE-01 are primary extraction wells; TW-02S and TW-02D are backup extraction wells)*
- Bedrock Contact at 396 ft AMSL Elevation
- Interpreted Groundwater Flow Direction
- Inferred Cr(VI) Concentration Contour (see note 2)

0 300 600
Feet

N

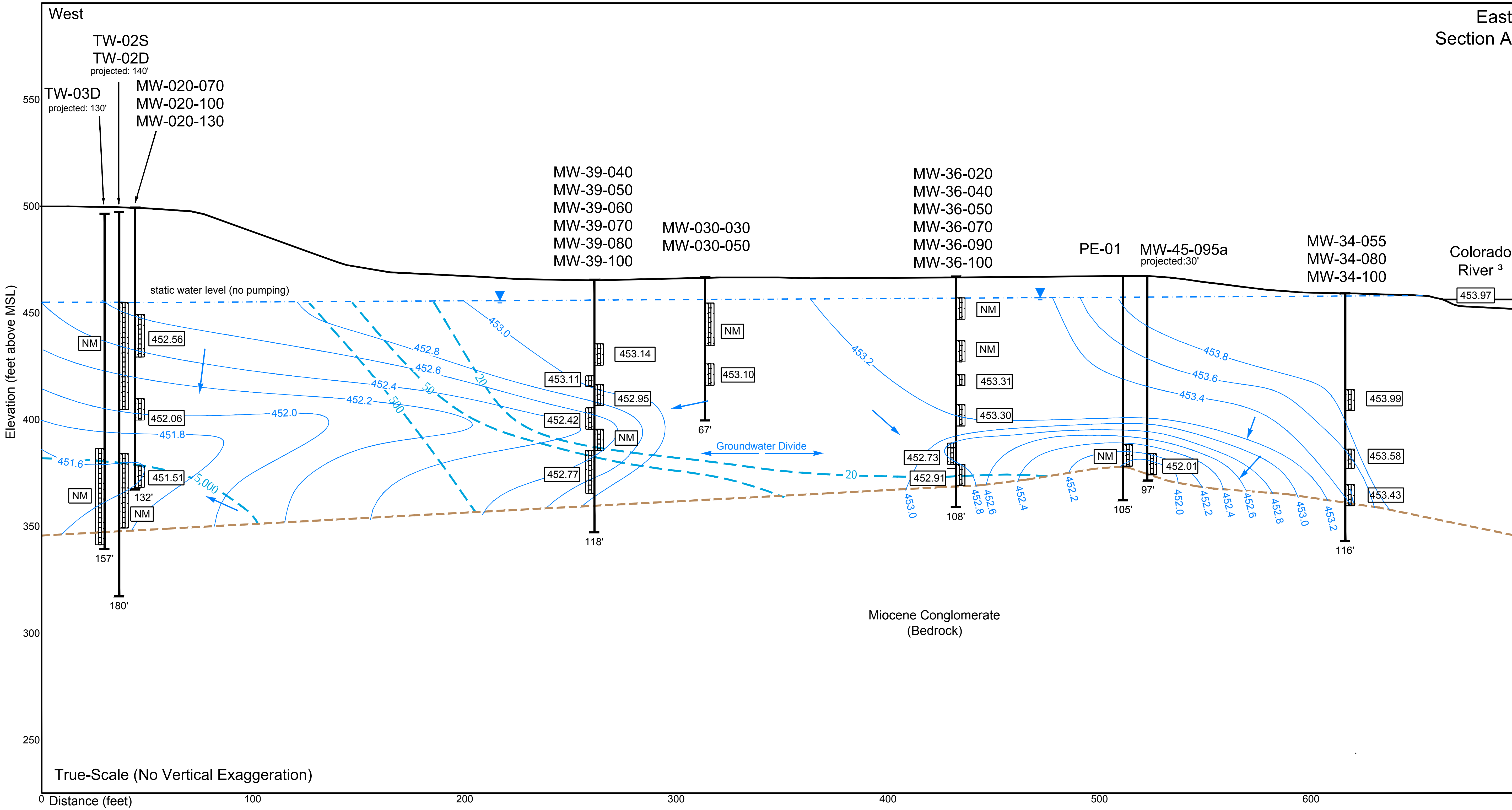
MW-36-090——Gauging Location
452.73——Average Groundwater Elevation (ft AMSL)
(452.91)——Elevation in red parentheses not used for contouring

FIGURE 4-3c
AVERAGE GROUNDWATER ELEVATIONS IN DEEP WELLS, FOURTH QUARTER 2016

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

Created by: CRITIGEN

UNK R:\GIS\TOPOCKGIS\MAPFILES\2016\GMP\2016Q4\FIGURE4-3C_2016Q4_GWE_DEEP.MXD 3/14/2017 12:44:03 PM



Notes:

1. Results show average groundwater elevations for November 2016 through December 2016 measured with transducers at 30-minute intervals.

2. Groundwater elevations adjusted for salinity and temperature.

3. Colorado River elevation shown as quarterly average from I-3 gauge.

AMSL = above mean sea level.
NM = well not measured or used in contouring.
ppb = concentration in parts per billion

Legend

MW-030-050

Inferred water table

well screen 453.10

boring depth (feet) 103

20

Inferred hexavalent chromium contour (ppb) in Alluvial Aquifer.

453.8

Groundwater head contour

Interpreted groundwater flow direction

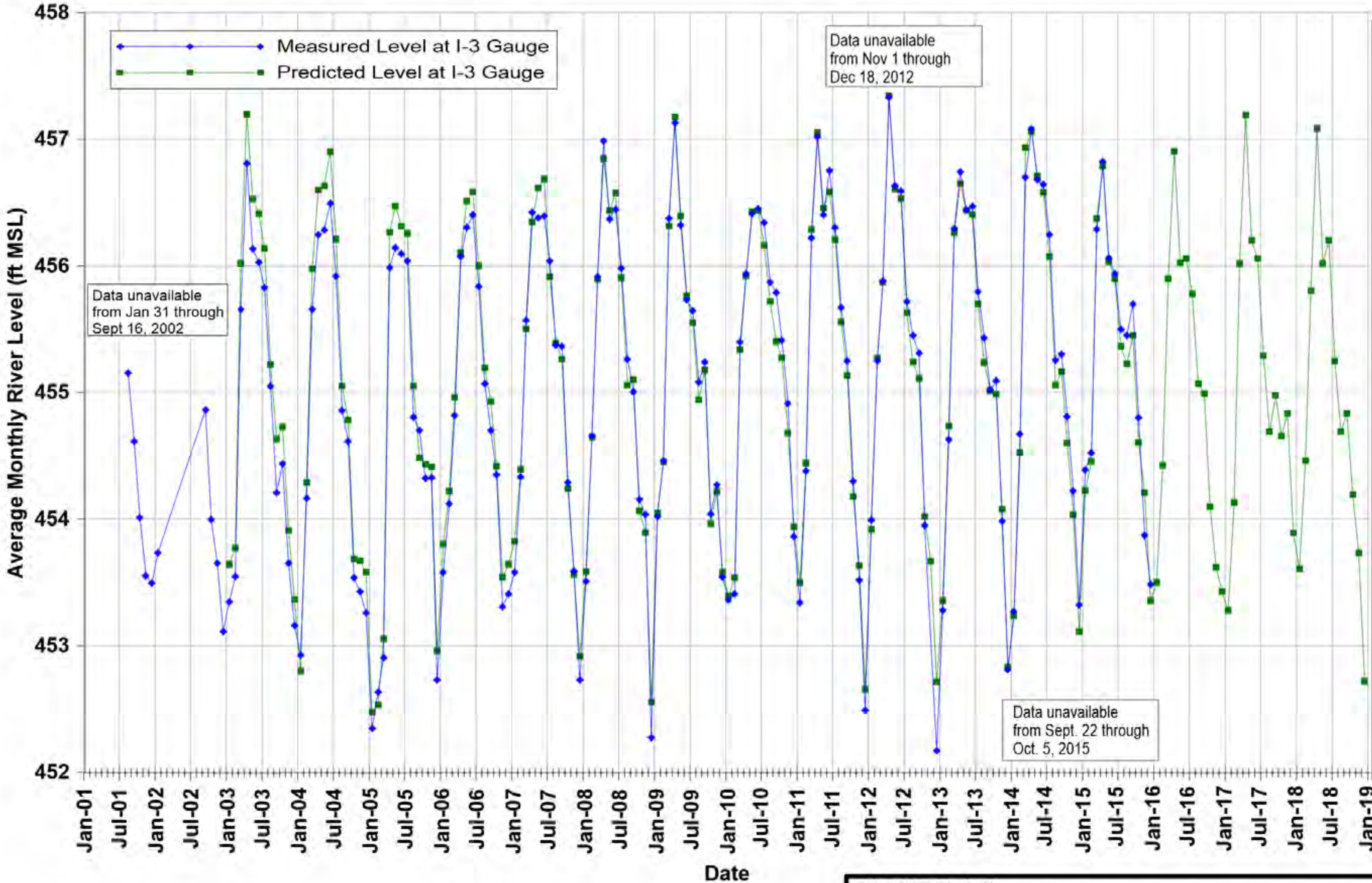
Average groundwater head (ft AMSL)

FIGURE 4-4

AVERAGE GROUNDWATER ELEVATIONS FOR WELLS IN FLOODPLAIN CROSS-SECTION A, FOURTH QUARTER 2016

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS



Note:
Projected river level for each month in the past is calculated based on the preceding months USBR projections of Davis Dam release and stage in Lake Havasu. Future projections of river level at I-3 are based upon January 2017 USBR projections. These data are reported monthly by the US Department of Interior, at http://www.usbr.gov/lc/region/g4000/24mo.pdf

ft-MSL = feet mean sea level
USBR = United States Bureau of Reclamation

FIGURE 4-5
PAST AND PREDICTED FUTURE RIVER LEVELS AT TOPOCK COMPRESSOR STATION

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS

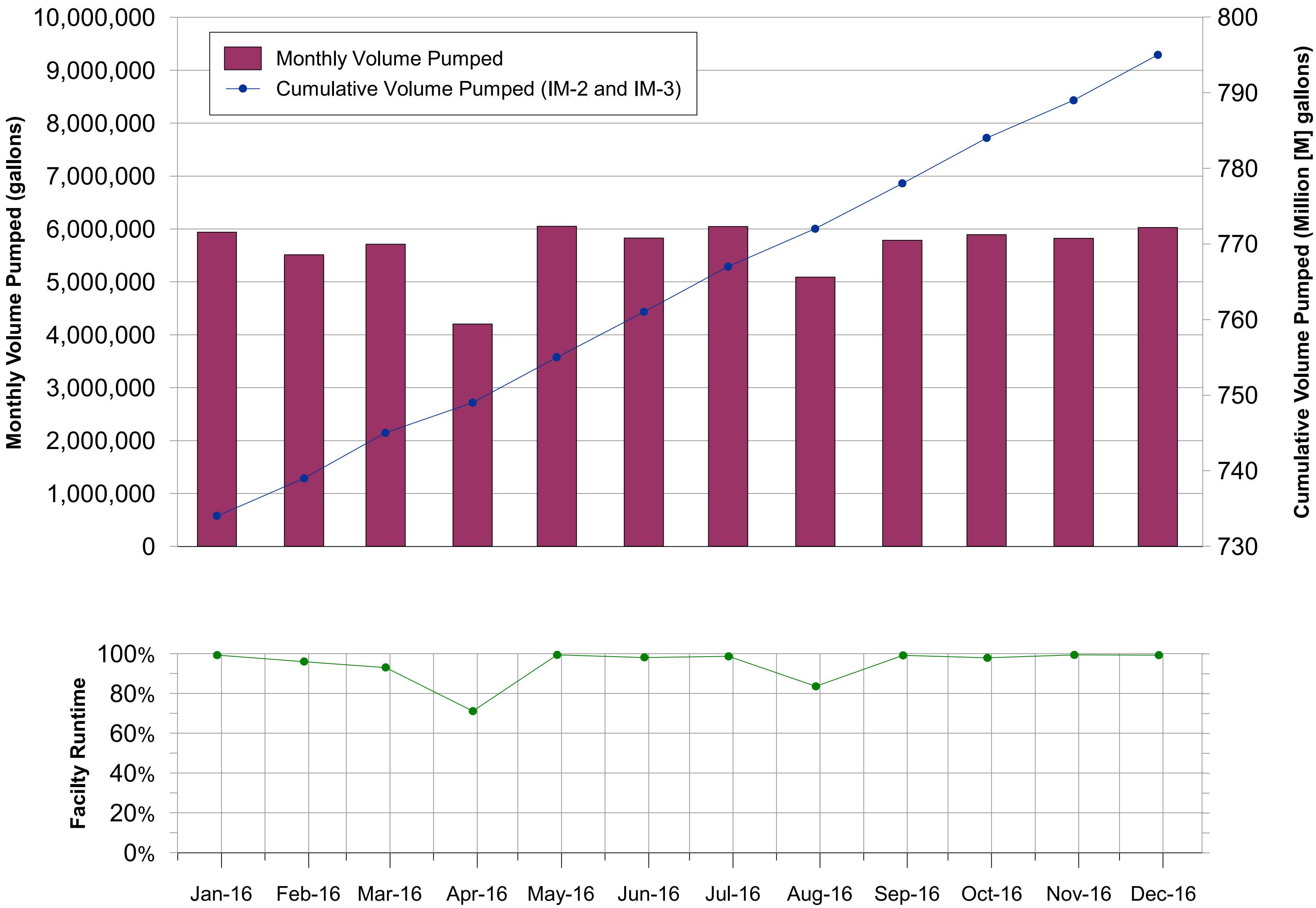
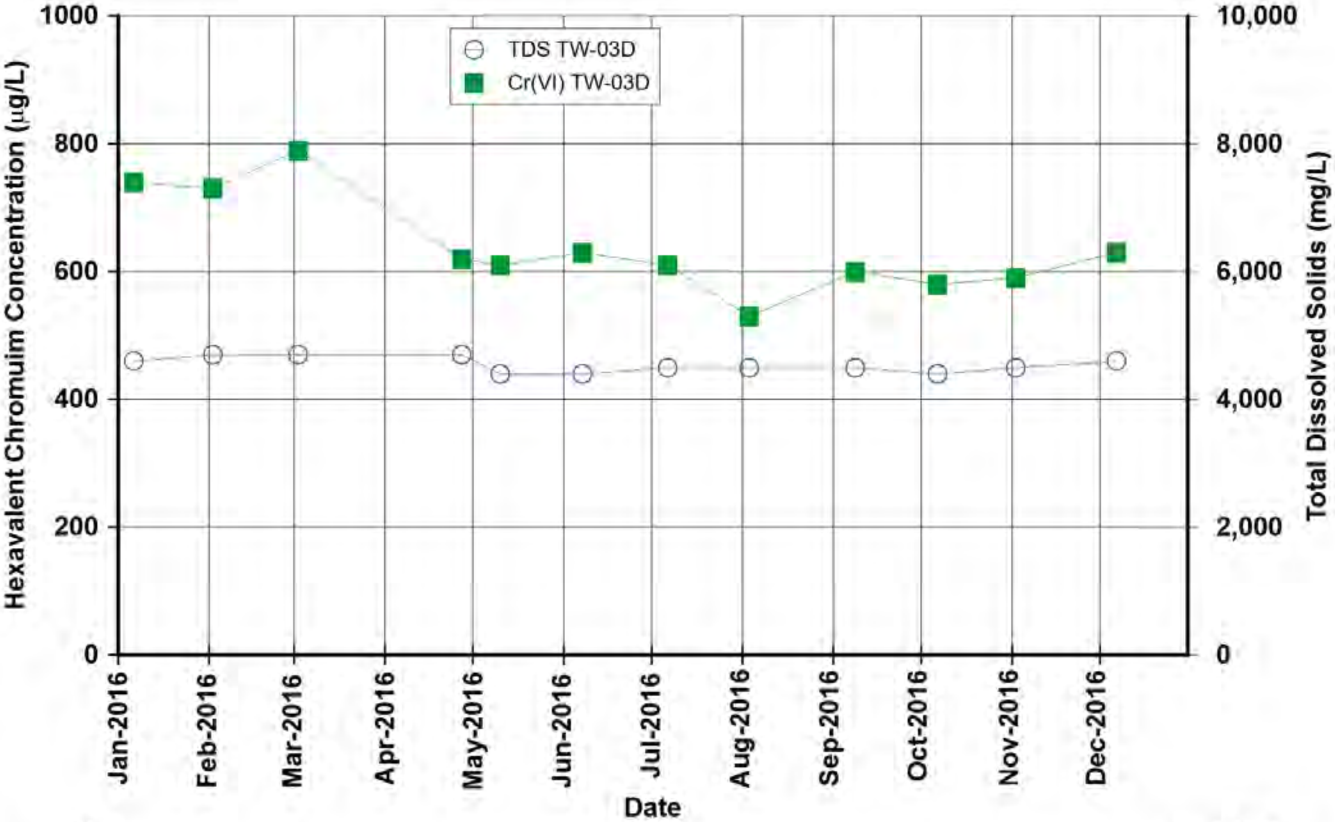
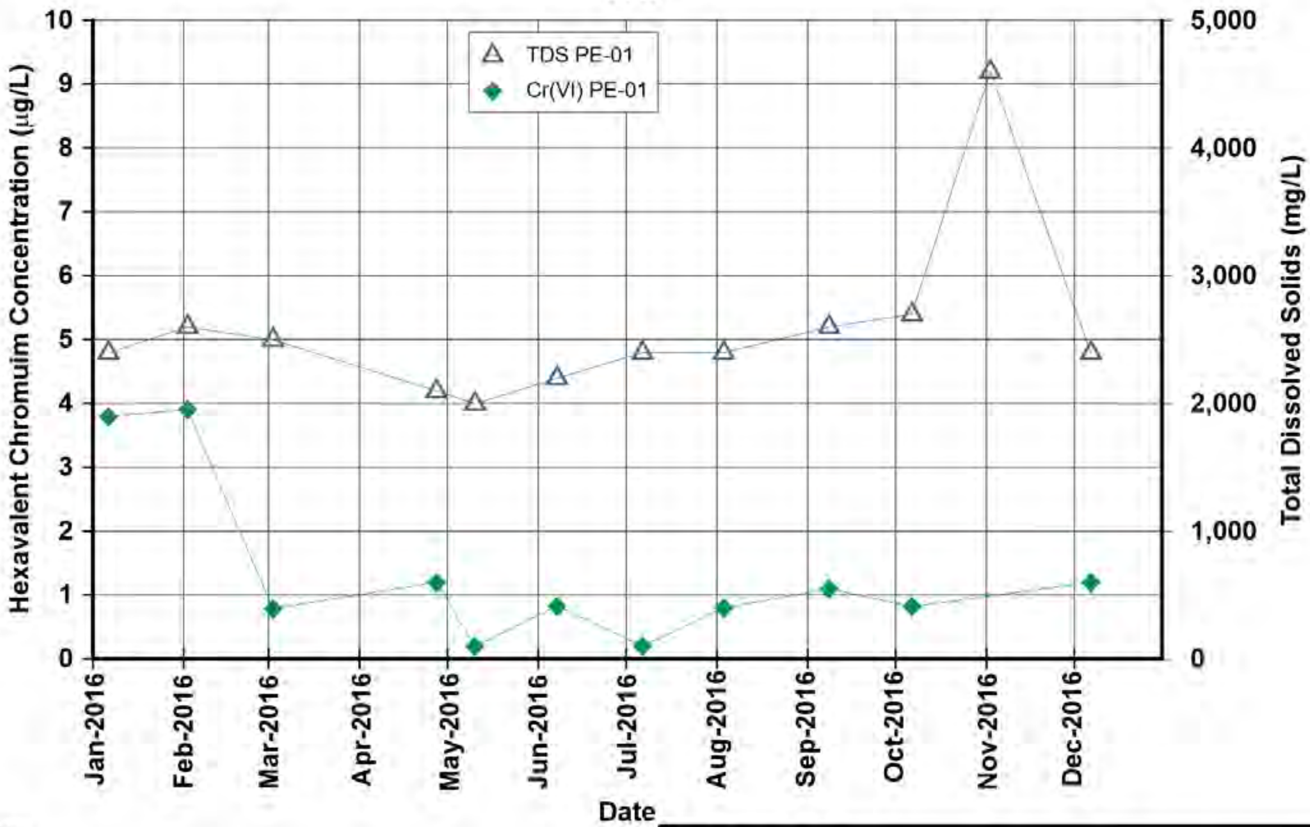


FIGURE 5-1
MONTHLY COMBINED PUMPING VOLUMES AND PERCENT UPTIME, 2016 REPORTING PERIOD
FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

CH2MHILL





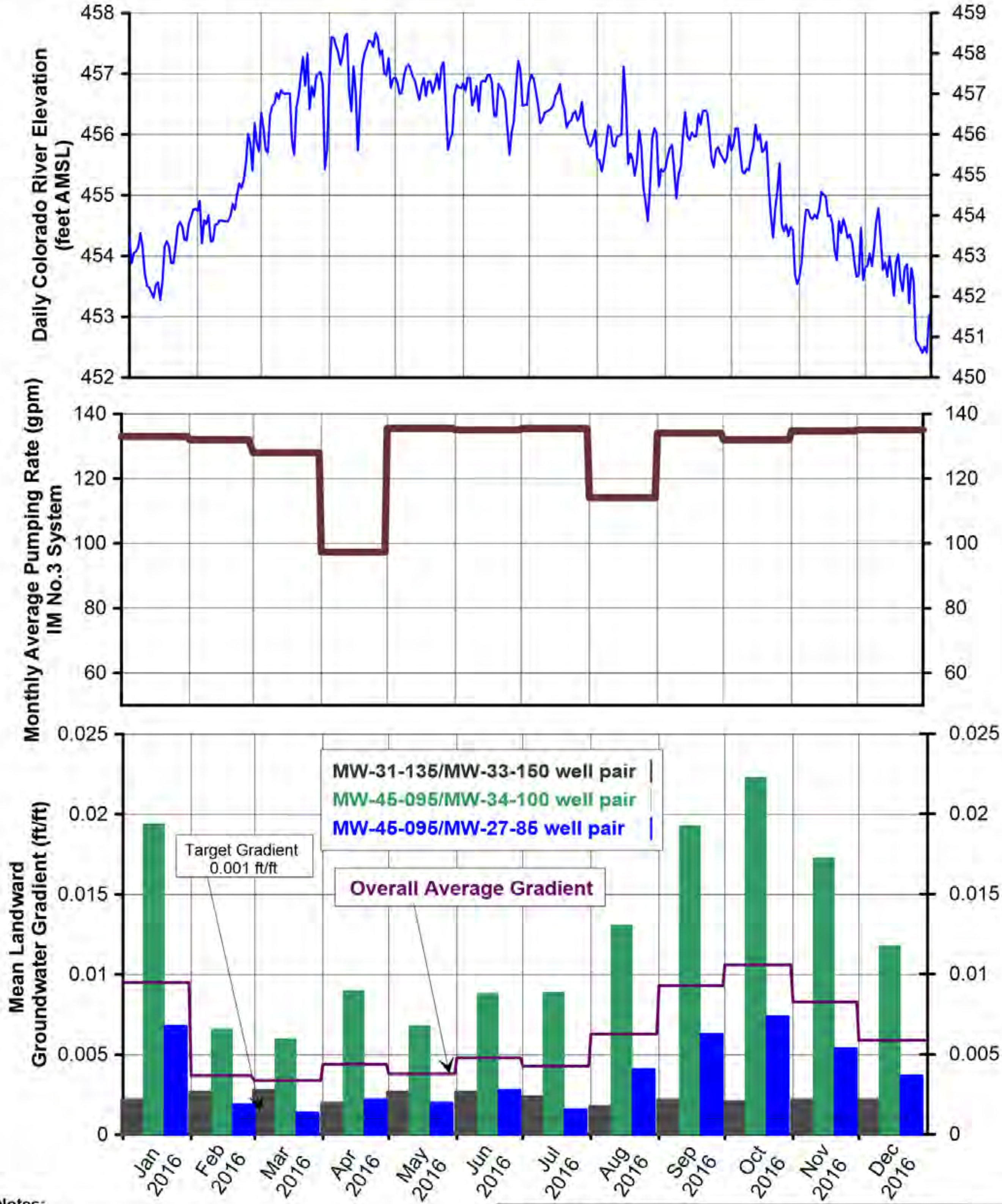
Notes:
Cr(VI) = hexavalent chromium
gpm = gallons per minute.
μg/L = micrograms per liter.
mg/L = milligrams per liter.
TDS = total dissolved solids

TW-3D pumping began on 20-Dec-05.
PE-1 pumping began on 26-Jan-06.

For average pumping information see Table 5-1.

FIGURE 5-2
Cr(VI) AND TOTAL DISSOLVED SOLIDS CONCENTRATIONS IN EXTRACTION WELLS TW-03D AND PE-01, 2016 REPORTING PERIOD
FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS



Notes:

1. For IM pumping, the target landward gradient for well pairs is 0.001 feet/foot.
2. Refer to Table 4-1 and Section 4.4 for discussion of pumping data.
3. Pumping rate plotted is the combined rate of extraction wells TW-3D and PE-1 in operation each month.
4. Refer to Table 4-2 and Section 4.5 for discussion of gradient data.
5. AMSL = above mean sea level.
6. gpm = gallons per minute

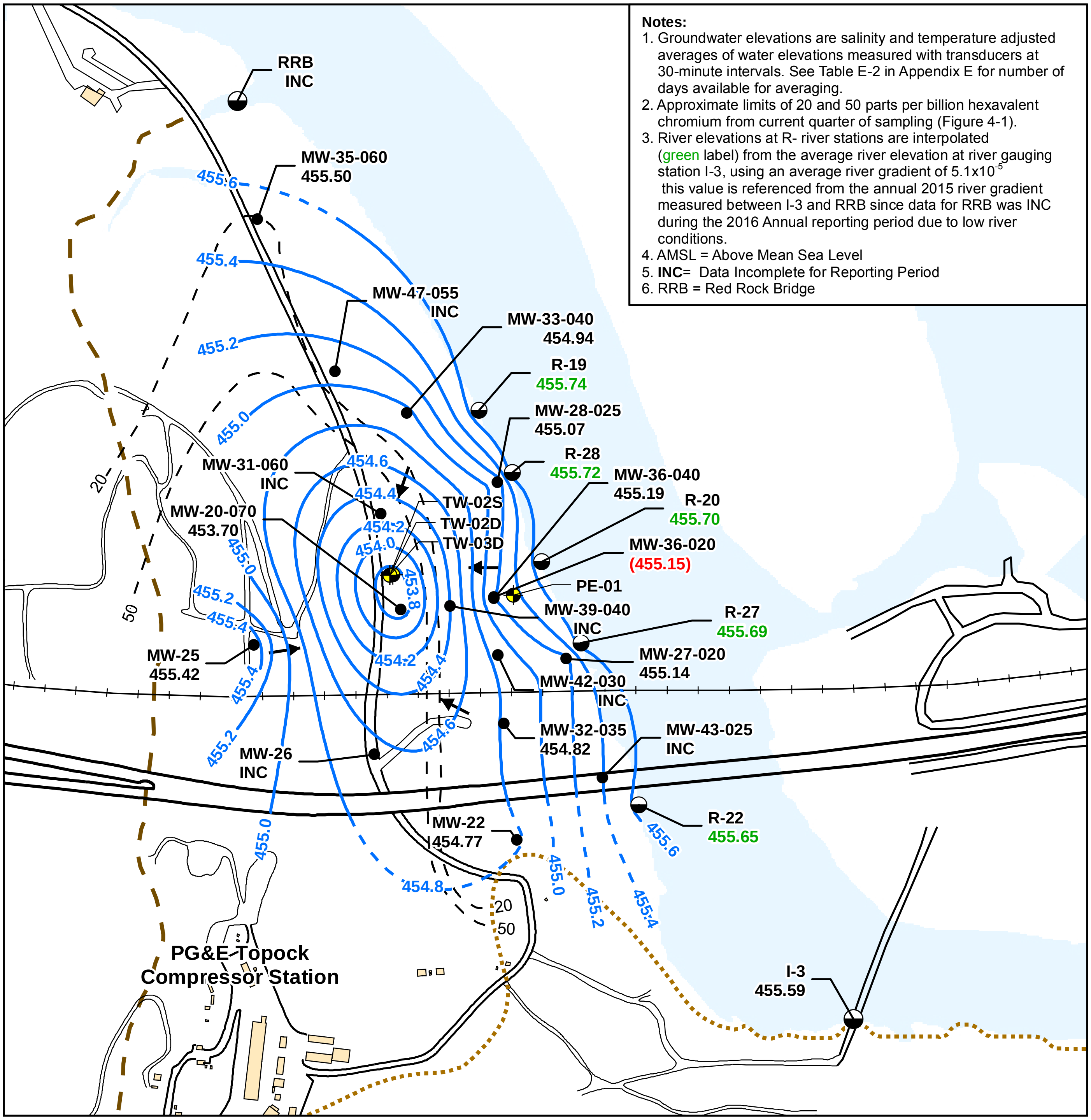
FIGURE 5-3
MEASURED HYDRAULIC GRADIENTS, RIVER ELEVATION, AND PUMPING RATE, 2016 REPORTING PERIOD

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS

\\arcadis-us.com\officedata\Denver-CO-Technical\Aproject\PG&E - Groundwater Monitoring\Reporting\00_Arcadis_rpts\02_GMP_rpts\05_Q416

ARCADIS Design & Consultancy for natural and built assets



LEGEND

- Monitoring Well
- River Station
- Extraction Well (TW-03D and PE-01 are primary extraction wells; TW-02S and TW-02D are backup extraction wells)
- Bedrock Contact at 455 ft AMSL Elevation
- Interpreted Groundwater Flow Direction
- Groundwater Elevation Contour 0.2 ft (dashed where inferred)
- Inferred Cr(VI) Concentration Contour (see note 2)

MW-20-070 — Gauging Location
453.70 — Average Groundwater Elevation (ft AMSL)
(455.15) — Elevation in Red Parentheses Are Not Used in Contouring.
R-27 — River Station (see note 3)
453.69 — River Elevation (ft AMSL) Interpolated Average

0 300 600
Feet

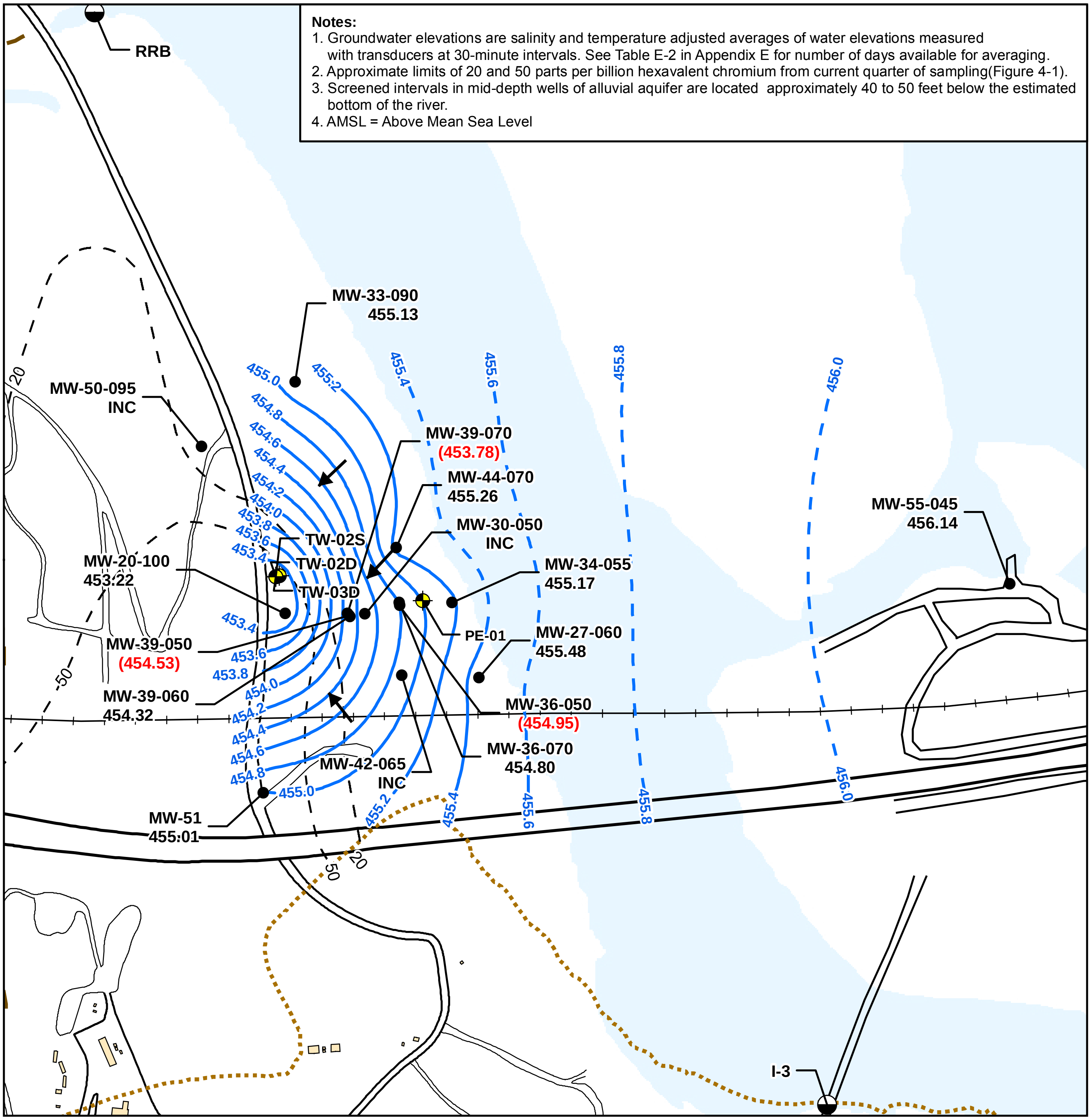
N

FIGURE 5-4a
AVERAGE GROUNDWATER ELEVATIONS IN SHALLOW WELLS AND RIVER ELEVATIONS, 2016 REPORTING PERIOD

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

Created by: CRITIGEN

![ARCADIS Design & Consultancy for natural and built assets]



Notes:
1. Groundwater elevations are salinity and temperature adjusted averages of water elevations measured with transducers at 30-minute intervals. See Table E-2 in Appendix E for number of days available for averaging.
2. Approximate limits of 20 and 50 parts per billion hexavalent chromium from current quarter of sampling(Figure 4-1).
3. Screened intervals in mid-depth wells of alluvial aquifer are located approximately 40 to 50 feet below the estimated bottom of the river.
4. AMSL = Above Mean Sea Level

LEGEND

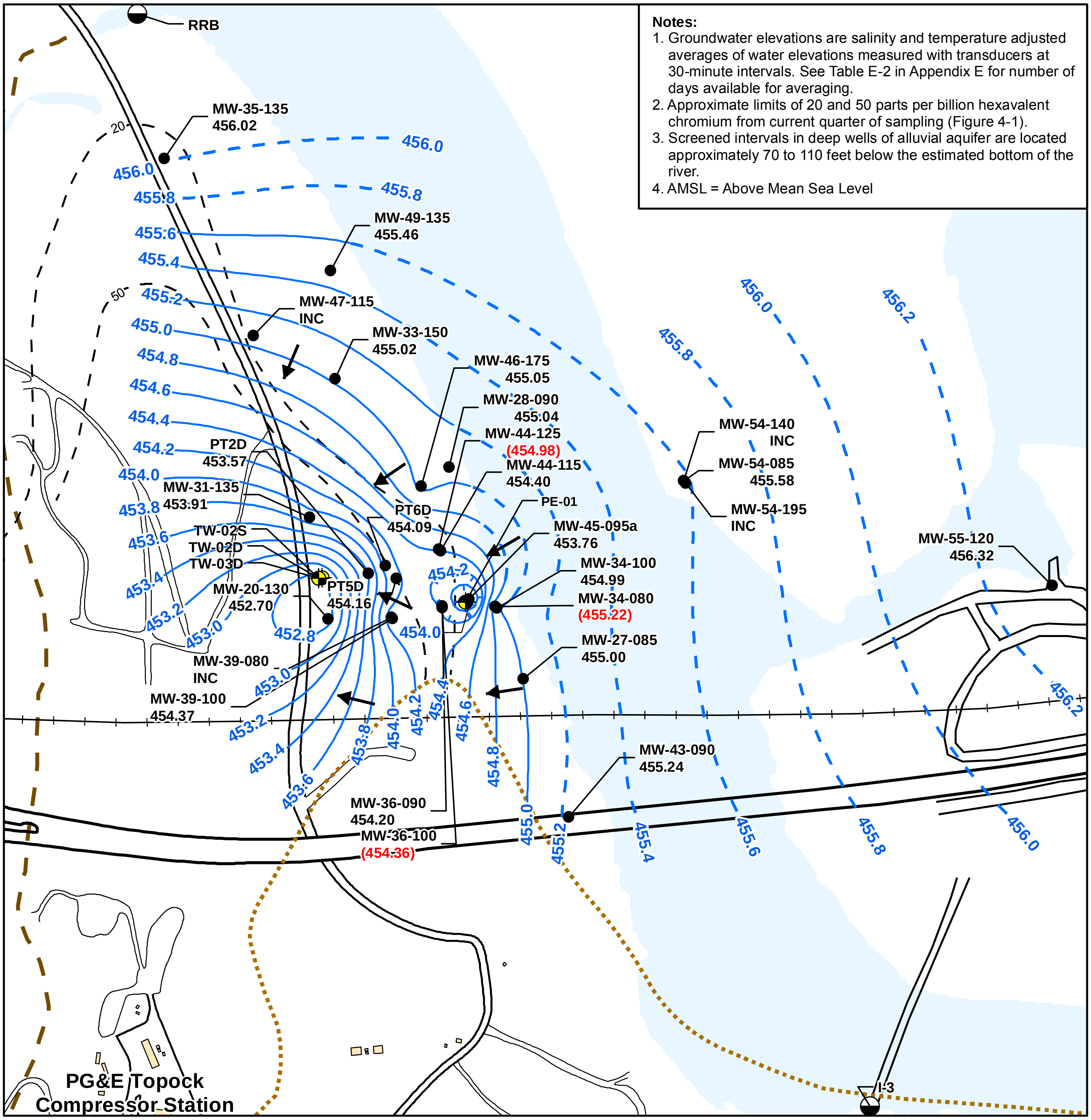
- Monitoring Well
- River Station
- Extraction Well (TW-03D and PE-01 are primary extraction wells; TW-02S and TW-02D are backup extraction wells)
- Bedrock Contact at 425 ft AMSL elevation
- Interpreted Groundwater Flow Direction
- Groundwater Elevation Contour 0.2 ft (dashed where inferred)
- Inferred Cr(VI) Concentration Contour (see note 2)

MW-36-070 — Gauging Location
454.80 — Average Groundwater Elevation (ft AMSL)
(454.95) — Elevations in red parentheses not used for contouring

FIGURE 5-4b
AVERAGE GROUNDWATER ELEVATIONS IN MID-DEPTH WELLS, 2016 REPORTING PERIOD

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

Created by: CRITIGEN



Notes:

1. Groundwater elevations are salinity and temperature adjusted averages of water elevations measured with transducers at 30-minute intervals. See Table E-2 in Appendix E for number of days available for averaging.
2. Approximate limits of 20 and 50 parts per billion hexavalent chromium from current quarter of sampling (Figure 4-1).
3. Screened intervals in deep wells of alluvial aquifer are located approximately 70 to 110 feet below the estimated bottom of the river.
4. AMSL = Above Mean Sea Level

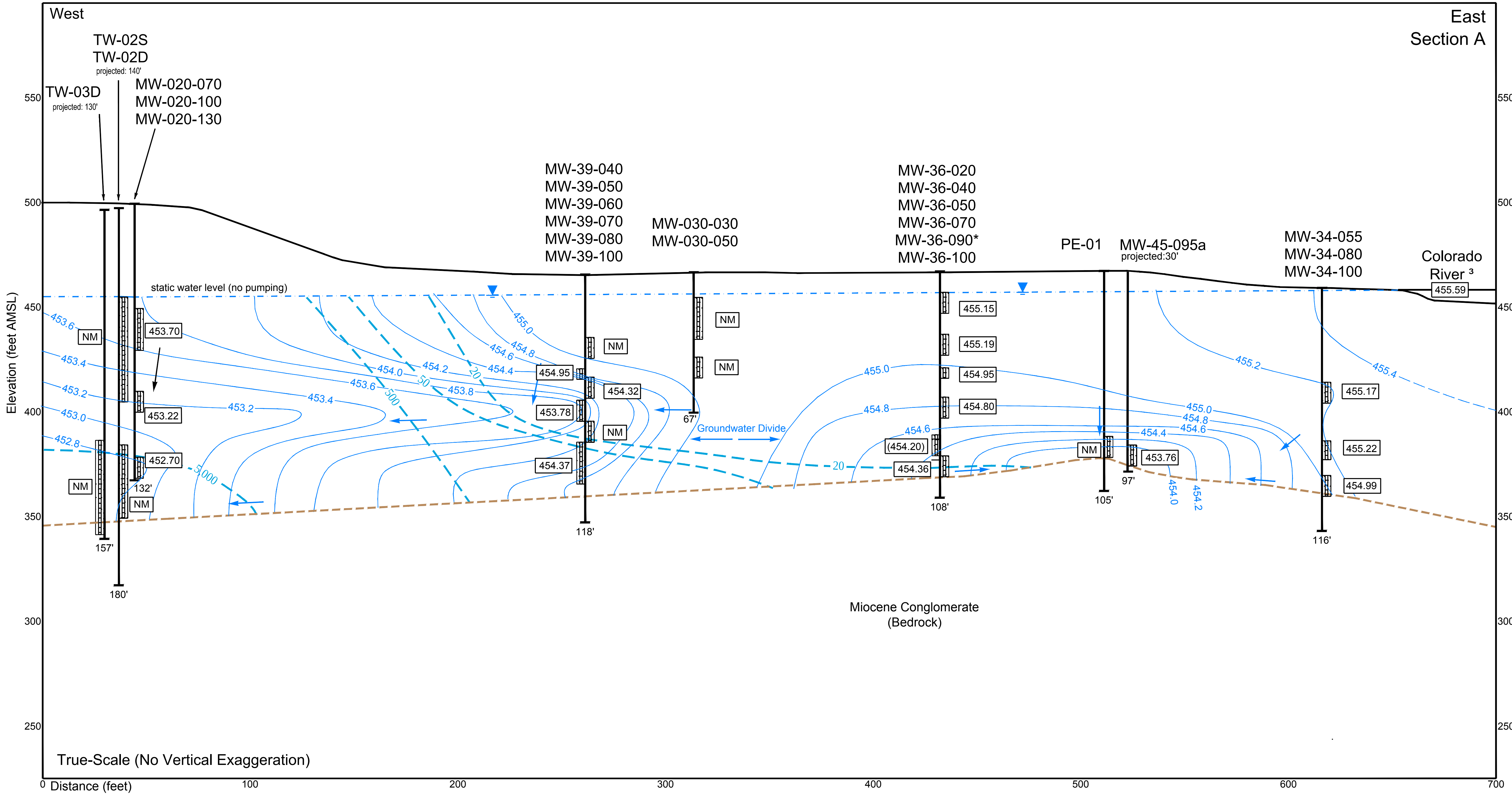
LEGEND

- Monitoring Well
- Extraction Well (TW-03D and PE-01 are primary extraction wells; TW-02S and TW-02D are backup extraction wells)
- Bedrock Contact at 395 ft AMSL elevation
- Interpreted Groundwater Flow Direction
- Groundwater Elevation Contour 0.2 ft (dashed where inferred)
- Inferred Cr(VI) Concentration Contour (see note 2)

MW-34-100 — Gauging Location
454.99 — Average Groundwater Elevation (ft AMSL)
(455.22) — Elevation in red parentheses not used for contouring

FIGURE 5-4c
AVERAGE GROUNDWATER ELEVATIONS IN DEEP WELLS, 2016 REPORTING PERIOD

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA



Notes:

1. Results show average groundwater elevations for 2016 measured with transducers at 30-minute intervals.

2. Groundwater elevations adjusted for salinity and temperature. Well MW-36-090* is excluded from contouring.

3. Colorado River elevation shown as interpolated annual average from I-3 gauge.

AMSL = above mean sea level.
NM = well not measured or used in contouring.
ppb = concentration in parts per billion

Legend

MW-030-050

Inferred water table

well screen

454.95

boring depth (feet)

67'

(454.20) value excluded from contouring

20
Inferred hexavalent chromium contour (ppb) in Alluvial Aquifer.

453.8
Groundwater head contour

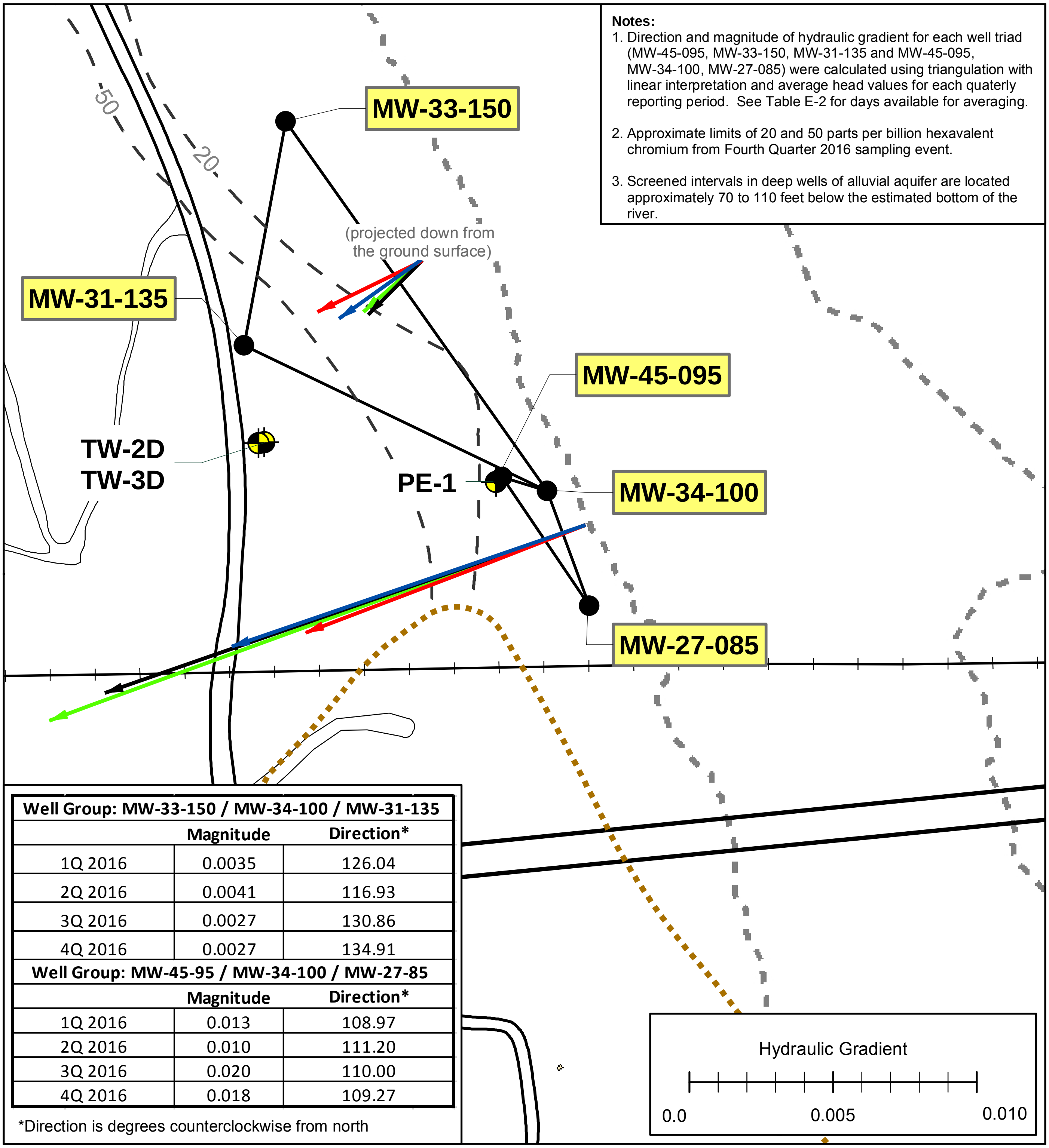
453.8
Inferred groundwater head contour

Interpreted groundwater flow direction

Average groundwater head (ft AMSL)

FIGURE 5-5
AVERAGE GROUNDWATER ELEVATIONS FOR WELLS IN FLOODPLAIN CROSS-SECTION A, 2016 REPORTING PERIOD
FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS



Notes:

1. Direction and magnitude of hydraulic gradient for each well triad (MW-45-095, MW-33-150, MW-31-135 and MW-45-095, MW-34-100, MW-27-085) were calculated using triangulation with linear interpretation and average head values for each quaterly reporting period. See Table E-2 for days available for averaging.
2. Approximate limits of 20 and 50 parts per billion hexavalent chromium from Fourth Quarter 2016 sampling event.
3. Screened intervals in deep wells of alluvial aquifer are located approximately 70 to 110 feet below the estimated bottom of the river.

Well Group: MW-33-150 / MW-34-100 / MW-31-135		
	Magnitude	Direction*
1Q 2016	0.0035	126.04
2Q 2016	0.0041	116.93
3Q 2016	0.0027	130.86
4Q 2016	0.0027	134.91

Well Group: MW-45-95 / MW-34-100 / MW-27-85		
	Magnitude	Direction*
1Q 2016	0.013	108.97
2Q 2016	0.010	111.20
3Q 2016	0.020	110.00
4Q 2016	0.018	109.27

*Direction is degrees counterclockwise from north

LEGEND

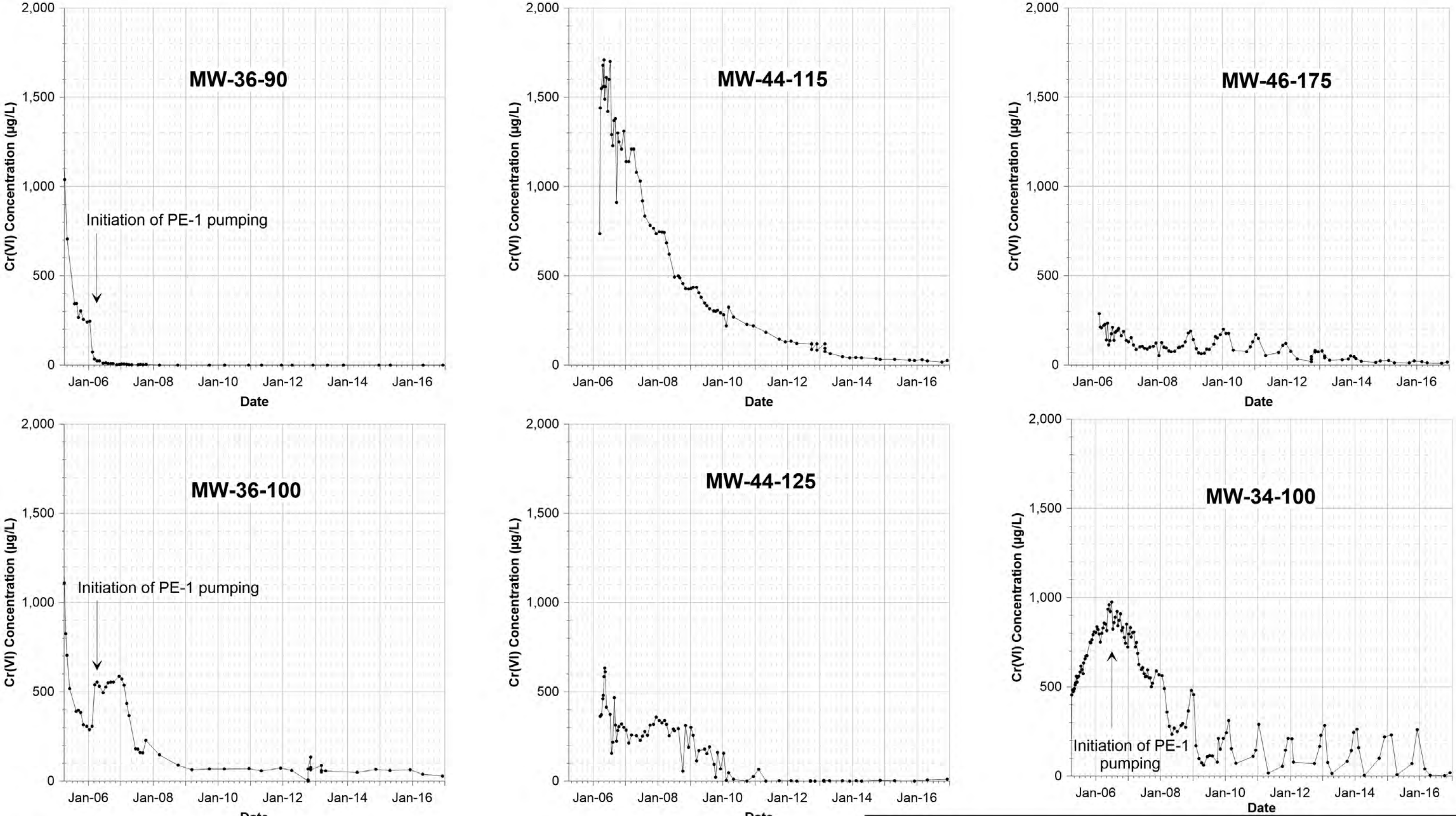
Calculated Average Gradients Magnitude and Direction

- First Quarter 2016
- Second Quarter 2016
- Third Quarter 2016
- Fourth Quarter 2016
- Approximate bedrock contact at 395 feet above mean sea level.

FIGURE 5-6
MAGNITUDE AND DIRECTION OF HYDRAULIC GRADIENTS IN LOWER DEPTH INTERVAL DURING 2016 ANNUAL PERIOD

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

Created by: CRITIGEN

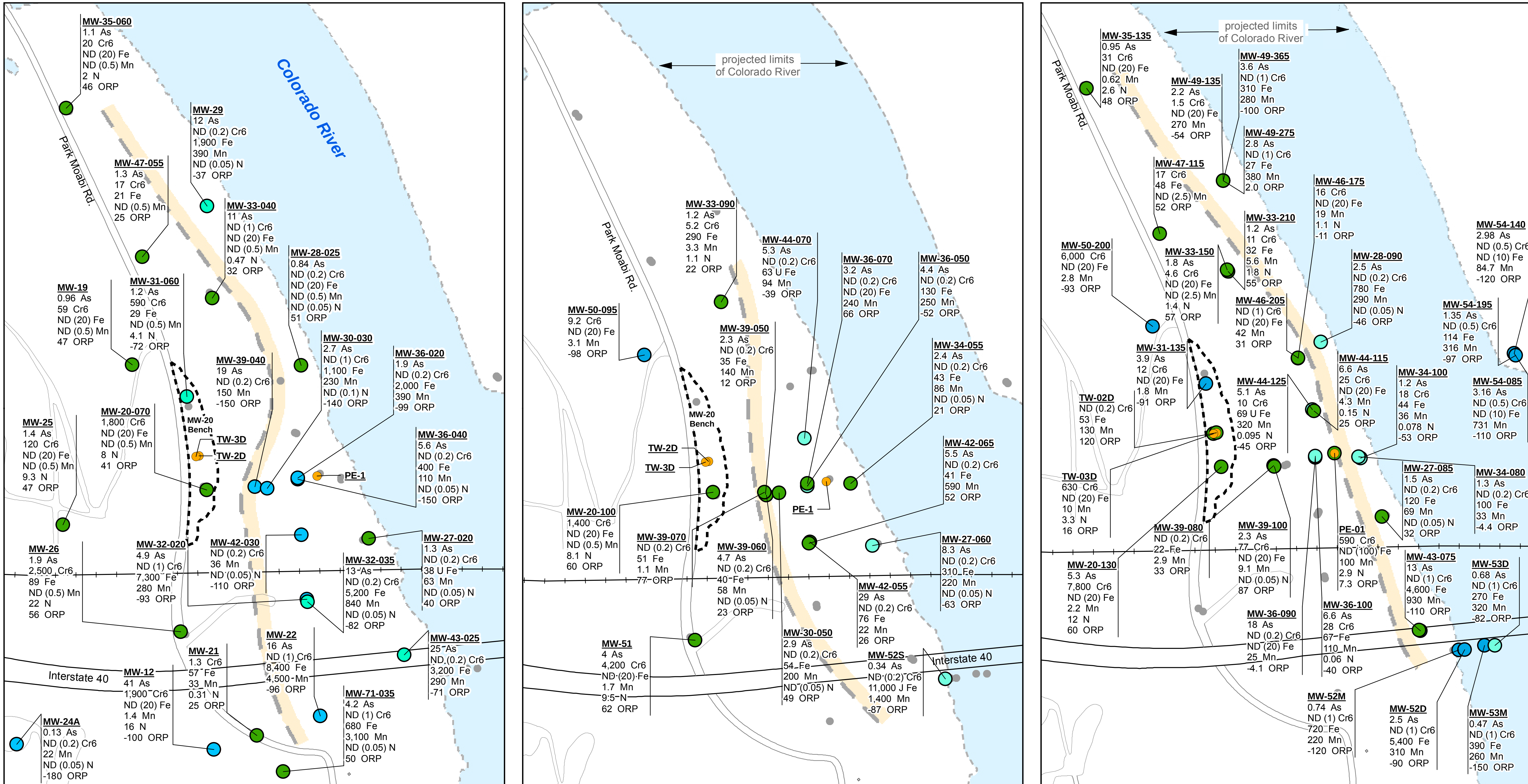


Notes:

1. Hexavalent chromium [Cr(VI)] results in micrograms per liter (µg/L), equivalent to parts per billion (ppb).
2. Results plotted are maximum concentrations from primary and duplicate samples; see Table 3-1 for complete results.
3. MW-36 wells selected to monitor effects of PE-1 pumping on plume west of PE-1. MW-44 wells, MW-46-175, and MW-34-100 selected to monitor concentrations within the plume.

FIGURE 5-7
Cr(VI) CONCENTRATION TRENDS IN SELECTED PERFORMANCE MONITORING WELLS, APRIL 2005 THROUGH DECEMBER 2016
FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS



Shallow Wells (Upper Depth Interval) - 2016 | **Intermediate Wells (Middle Depth Interval) - 2016** | **Deep Wells (Lower Depth Interval) - 2016**

LEGEND

- Approximate limit of reducing groundwater based upon a **combination** of redox indicator parameters and historical data trends
- Groundwater ORP < -90 mV
- Groundwater -90 mV < ORP < 1 mV
- Groundwater ORP > 1 mV
- IM3 Extraction Wells (TW-2D, TW-3D, and PE-1)

MW-22	Groundwater Results, Fourth Quarter 2016
12	As - Arsenic,mircrograms per liter (µg/L)
ND (1)	Cr6 - Hexavalent chromium,micrograms per liter (µg/L)
9400	Fe - Iron
4400	Mn - Manganese,millivolts (mV)
ND (2.5)	N - Nitrate/Nitrite,mircrograms per liter (µg/L),mircrograms per liter (µg/L)
-65.7	ORP - Oxidation reduction potential,milligrams per liter (mg/L)

Notes:
1. "ND" = Cr(VI) not detected at listed reporting limit.
2. "J" = The analyte was positively identified: the associated numerical value is the approximate concentration of the analyte in the sample.

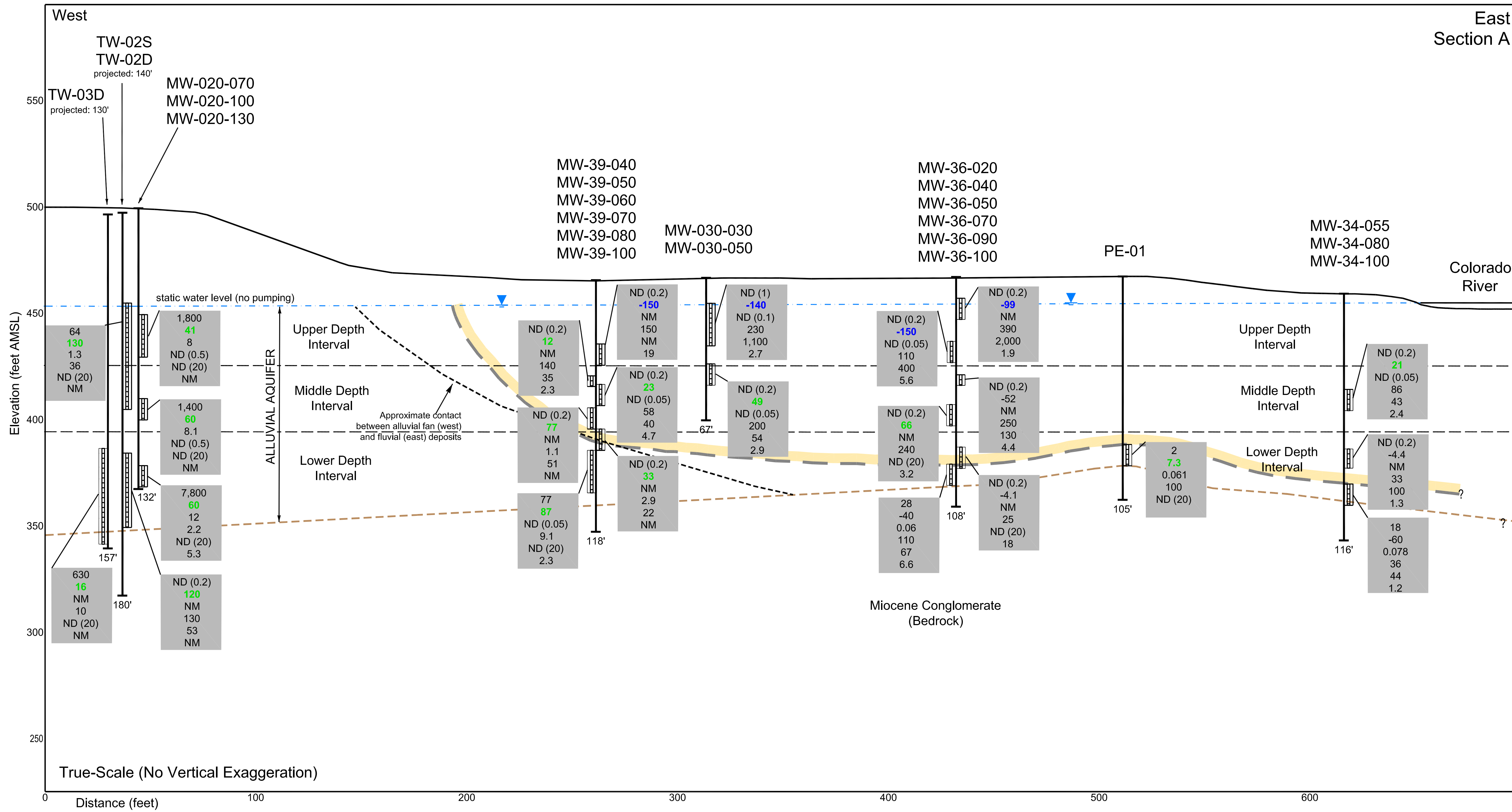
N

0 200 400 Feet

FIGURE 5-8
DISTRIBUTION OF CR(VI), GEOCHEMICAL INDICATOR PARAMETERS, AND IN SITU BYPRODUCTS IN FLOODPLAIN WELLS

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

Created by: CRITIGEN



Legend

water level

well screen

boring depth (feet)

103

1,400
60
8.1
ND (0.5)
ND (20)
NM

Groundwater Results

Hexavalent chromium, micrograms per liter (µg/L)
Oxidation reduction potential, millivolts (mV)
Nitrate/Nitrite as N or Nitrate as N, milligrams per liter (mg/L)
Manganese (Mn), micrograms per liter (µg/L)
Iron (Fe), micrograms per liter (µg/L)
Arsenic (As), micrograms per liter (µg/L)

ORP values less than -090 mV highlighted blue
Positive ORP values highlighted green

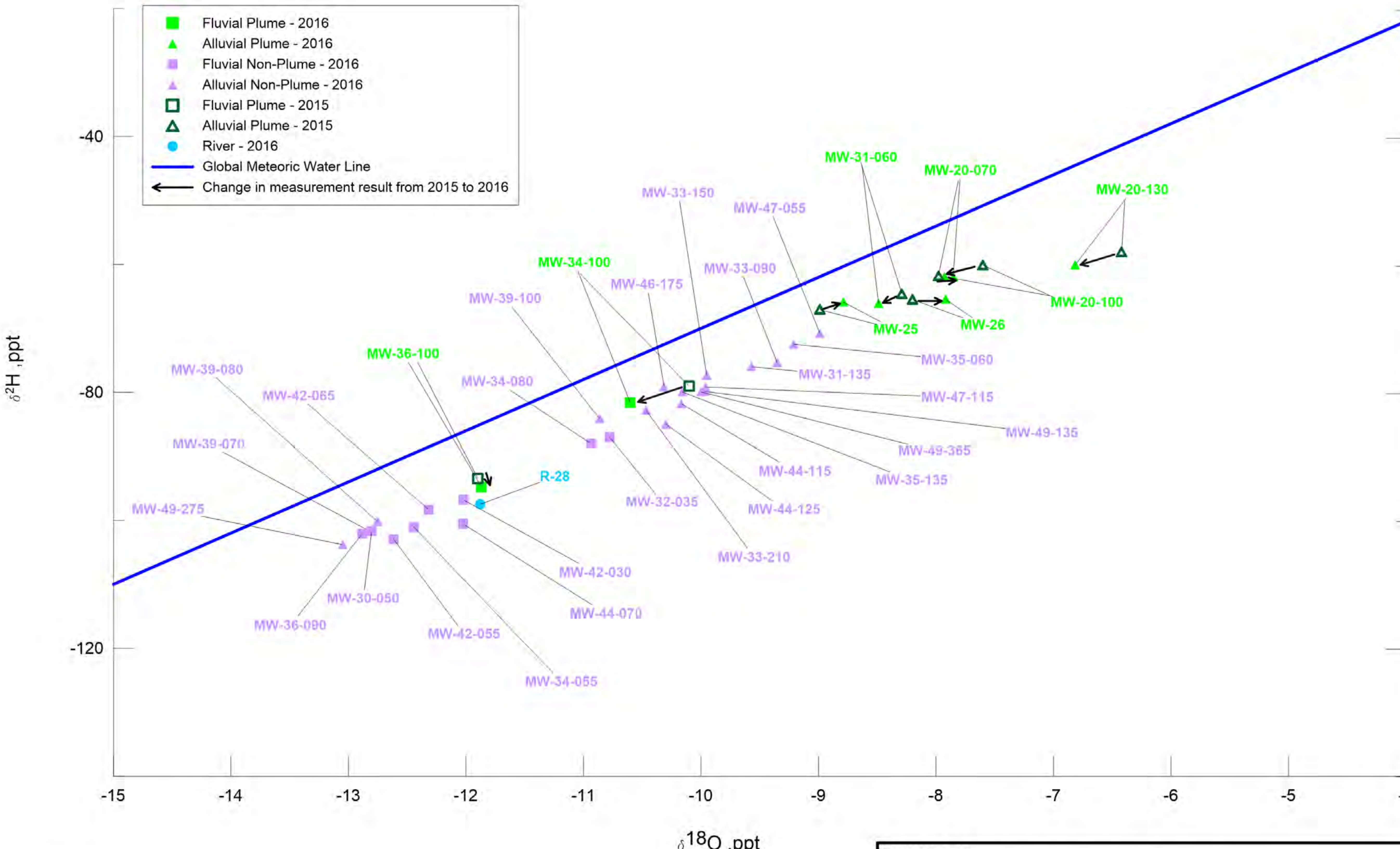
Approximate limit of reducing water; based on a combination of redox indicator parameters and historical data trends.

Groundwater ORP <-090mV
Groundwater ORP -090mV <ORP<1mV
Groundwater ORP >1mV

Notes:
ND = not detected at listed reporting limit.
NA = data not collected during reporting period.

FIGURE 5-9
DISTRIBUTION OF CR(VI), GEOCHEMICAL INDICATOR PARAMETERS, AND IN SITU BYPRODUCTS IN FLOODPLAIN WELLS CROSS-SECTION A, FOURTH QUARTER 2015
FOURTH QUARTER 2015 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS



Notes:
ppt = parts per thousand.

1. Values for Performance Monitoring Program (PMP) wells are from the Fourth Quarter 2016 reporting period.

FIGURE 5-10
STABLE ISOTOPES OF OXYGEN AND DEUTERIUM,
FOURTH QUARTER 2016
FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS

\\arcadis-us.com\officedata\Denver-CO-Technical\Aproject\PG&E - Groundwater Monitoring\Reporting\00_Arcadis_rpts\02_GMP_rpts\05_Q416

APPENDIX A

Well Inspections and Construction Information

TABLE A-1
Well Construction and Sampling Summary, Fourth Quarter 2016
Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

Well ID	Site Area	Measuring Point Elevation (ft amsl)	Well Screen Depth Interval (ft bgs)	Well Screen Lithology	Well Casing (inches)	Well Depth (ft bgs)	Depth to Water (ft btoc)	Sampling System	Remarks
GMP MONITORING WELLS									
MW-9	Bat Cave Wash	536.56	77 - 87	Alluvial	4 in PVC	89.4	80.30	Minimal Drawdown	
MW-10	Bat Cave Wash	530.65	74 - 94	Alluvial	4 in PVC	96.9	74.90	Minimal Drawdown	
MW-11	Bat Cave Wash	522.54	62.5 - 82.5	Alluvial	4 in PVC	86.1	66.73	Minimal Drawdown	
MW-12	East of Station	484.01	27.5 - 47.5	Alluvial	4 in PVC	50.4	28.91	Minimal Drawdown	
MW-13	Bat Cave Wash	488.64	28.5 - 48.5	Alluvial	4 in PVC	52.0	32.41	Minimal Drawdown	
MW-14	East Mesa	570.99	111 - 131	Alluvial	4 in PVC	133.8	115.11	Minimal Drawdown	
MW-15	East of New	641.52	180.5 -	Alluvial	4 in PVC	203.0	184.78	Minimal Drawdown	
MW-16	Near New Ponds	657.31	198 - 218	Alluvial	4 in PVC	218.1	200.05	Minimal Drawdown	
MW-17	West of Mesa	589.96	130 - 150	Alluvial	4 in PVC	153.6	132.92	Minimal Drawdown	
MW-18	West Mesa	545.32	85 - 105	Alluvial	4 in PVC	106.7	88.96	Minimal Drawdown	
MW-19	Route 66	499.92	46 - 66	Alluvial	4 in PVC	65.8	45.54	Minimal Drawdown	
MW-20-70	MW-20 bench	500.07	50 - 70	Alluvial	4 in PVC	69.6	47.50	Minimal Drawdown	
MW-20-100	MW-20 bench	500.58	89.5 - 99.5	Alluvial	4 in PVC	101.4	48.40	Minimal Drawdown	
MW-20-130	MW-20 bench	500.66	121 - 131	Alluvial	4 in PVC	132.3	49.20	Minimal Drawdown	
MW-21	Route 66	505.55	39 - 59	Alluvial	4 in PVC	58.5	50.49	Minimal Drawdown	low recharge well; typically purges dry at 1 casing volume
MW-22	Floodplain	460.72	5.5 - 10.5	Fluvial	2 in PVC	12.4	7.00	Minimal Drawdown	
MW-23-060	East Ravine	504.08	50 - 60	Bedrock	2 in Sch 40 PVC	60.2	49.00	Three Volume	
MW-23-080	East Ravine	504.13	75 - 80	Bedrock	2 in Sch 40 PVC	80.8	51.00	Three Volume	
MW-24A	MW-24 Bench	567.16	104 - 124	Alluvial	4 in PVC	127.5	111.30	Minimal Drawdown	

TABLE A-1
Well Construction and Sampling Summary, Fourth Quarter 2016
Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

Well ID	Site Area	Measuring Point Elevation (ft amsl)	Well Screen Depth Interval (ft bgs)	Well Screen Lithology	Well Casing (inches)	Well Depth (ft bgs)	Depth to Water (ft btoc)	Sampling System	Remarks
GMP MONITORING WELLS									
MW-24B	MW-24 Bench	564.76	193 - 213	Alluvial	4 in PVC	214.8	109.60	Minimal Drawdown	
MW-24BR	MW-24 Bench	563.95	378 - 437	Bedrock	4 in PVC	441.0	108.20	Fixed Volume	low recharge well; typically purges dry at 1 casing volume
MW-25	Near Bat Cave	542.90	84.5 - 104.5	Alluvial	4 in PVC	106.5	87.91	Minimal Drawdown	
MW-26	Route 66	502.22	51.5 - 71.5	Alluvial	2 in PVC	70.1	48.00	Minimal Drawdown	
MW-27-20	Floodplain	460.56	7 - 17	Fluvial	2 in PVC	14.4	6.20	Minimal Drawdown	
MW-27-60	Floodplain	461.49	47.3 - 57.3	Fluvial	2 in PVC	59.0	7.20	Minimal Drawdown	
MW-27-85	Floodplain	460.99	77.5 - 87.5	Fluvial	2 in PVC	80.0	6.70	Minimal Drawdown	
MW-28-25	Floodplain	466.77	13 - 23	Fluvial	2 in PVC	21.1	12.50	Minimal Drawdown	
MW-28-90	Floodplain	467.53	70 - 90	Fluvial	2 in PVC	98.4	12.70	Minimal Drawdown	
MW-29	Floodplain	485.21	29.5 - 39.5	Fluvial	2 in PVC	41.5	30.20	Minimal Drawdown	
MW-30-30	Floodplain	468.12	12 - 32	Fluvial	2 in PVC	26.9	14.00	Minimal Drawdown	
MW-30-50	Floodplain	468.81	40 - 50	Fluvial	4 in PVC	52.6	14.80	Minimal Drawdown	
MW-31-60	MW-20 Bench	496.81	41.5 - 61.5	Alluvial	4 in PVC	64.0	43.00	Minimal Drawdown	
MW-31-135	MW-20 Bench	498.11	113 - 133	Alluvial	2 in PVC	135.4	46.00	Minimal Drawdown	
MW-32-20	Floodplain	461.51	10 - 20	Fluvial	2 in PVC	19.6	7.50	Minimal Drawdown	
MW-32-35	Floodplain	461.63	27.5 - 35	Fluvial	4 in PVC	37.2	7.80	Minimal Drawdown	
MW-33-40	Floodplain	487.38	29 - 39	Fluvial	2 in PVC	41.8	33.40	Minimal Drawdown	
MW-33-90	Floodplain	487.55	69 - 89	Alluvial	4 in PVC	88.3	33.50	Minimal Drawdown	
MW-33-150	Floodplain	487.77	132 - 152	Alluvial	2 in PVC	155.4	34.00	Minimal Drawdown	
MW-33-210	Floodplain	487.25	190 - 210	Alluvial	2 in PVC	223.0	33.70	Minimal Drawdown	
MW-34-55	Floodplain	460.95	45 - 55	Fluvial	4 in PVC	56.6	7.10	Minimal Drawdown	

TABLE A-1
Well Construction and Sampling Summary, Fourth Quarter 2016
Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

Well ID	Site Area	Measuring Point Elevation (ft amsl)	Well Screen Depth Interval (ft bgs)	Well Screen Lithology	Well Casing (inches)	Well Depth (ft bgs)	Depth to Water (ft btoc)	Sampling System	Remarks
GMP MONITORING WELLS									
MW-34-80	Floodplain	461.20	73 - 83	Fluvial	4 in PVC	84.3	7.50	Minimal Drawdown	
MW-34-100	Floodplain	460.97	89.5 - 99.5	Fluvial	2 in PVC	117.0	7.60	Minimal Drawdown	
MW-35-60	Route 66	484.33	41 - 61	Alluvial	2 in PVC	56.8	29.60	Minimal Drawdown	
MW-35-135	Route 66	484.24	116 - 136	Alluvial	2 in PVC	158.7	29.30	Minimal Drawdown	
MW-36-20	Floodplain	469.33	10 - 20	Fluvial	1 in PVC	20.3	16.20	Minimal Drawdown	
MW-36-40	Floodplain	469.59	30 - 40	Fluvial	1 in PVC	40.3	15.60	Minimal Drawdown	
MW-36-50	Floodplain	469.62	46 - 51	Fluvial	1 in PVC	108.0	15.40	Minimal Drawdown	
MW-36-70	Floodplain	469.27	60 - 70	Fluvial	1 in PVC	70.3	15.50	Minimal Drawdown	
MW-36-90	Floodplain	469.64	80 - 90	Fluvial	1 in PVC	90.3	13.80	Minimal Drawdown	
MW-36-100	Floodplain	469.65	88 - 98	Fluvial	2 in PVC	108.0	16.20	Minimal Drawdown	
MW-37D	Bat Cave Wash	486.19	180 - 200	Alluvial	2 in PVC	226.7	31.50	Minimal Drawdown	
MW-37S	Bat Cave Wash	485.97	64 - 84	Alluvial	2 in PVC	85.0	31.00	Minimal Drawdown	
MW-38D	Bat Cave Wash	525.31	163 - 183	Alluvial	2 in PVC	190.9	70.40	Minimal Drawdown	
MW-38S	Bat Cave Wash	526.59	75 - 95	Alluvial	2 in PVC	98.1	70.63	Minimal Drawdown	
MW-39-40	Floodplain	468.02	30 - 40	Fluvial	1 in PVC	42.1	15.00	Minimal Drawdown	
MW-39-50	Floodplain	467.93	47 - 52	Fluvial	1 in PVC	54.6	15.00	Minimal Drawdown	
MW-39-60	Floodplain	468.00	49 - 59	Alluvial	1 in PVC	15.2	15.20	Minimal Drawdown	
MW-39-70	Floodplain	468.02	60 - 70	Alluvial	1 in PVC	71.7	15.60	Minimal Drawdown	
MW-39-80	Floodplain	467.92	70 - 80	Alluvial	1 in PVC	82.6	15.50	Minimal Drawdown	
MW-39-100	Floodplain	468.12	80 - 100	Alluvial	2 in PVC	117.7	15.00	Minimal Drawdown	
MW-40D	I-40 Median	566.08	240 - 260	Alluvial	2 in PVC	266.0	111.00	Minimal Drawdown	
MW-40S	I-40 Median	566.04	115 - 135	Alluvial	2 in PVC	134.0	111.39	Minimal Drawdown	
MW-41D	Bat Cave Wash	479.42	271 - 291	Alluvial	2 in PVC	311.5	24.30	Minimal Drawdown	

TABLE A-1
Well Construction and Sampling Summary, Fourth Quarter 2016
Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

Well ID	Site Area	Measuring Point Elevation (ft amsl)	Well Screen Depth Interval (ft bgs)	Well Screen Lithology	Well Casing (inches)	Well Depth (ft bgs)	Depth to Water (ft btoc)	Sampling System	Remarks
GMP MONITORING WELLS									
MW-41S	Bat Cave Wash	480.07	40 - 60	Alluvial	2 in PVC	60.0	24.93	Minimal Drawdown	
MW-42-30	Floodplain	463.74	9.8 - 29.8	Fluvial	2 in Sch 40 PVC	30.1	10.40	Minimal Drawdown	
MW-42-55	Floodplain	463.85	42.5 - 52.5	Fluvial	2 in PVC	52.8	9.80	Minimal Drawdown	
MW-42-65	Floodplain	463.37	56.2 - 66.2	Fluvial	2 in PVC	80.0	9.40	Minimal Drawdown	
MW-43-25	Floodplain	462.54	15 - 25	Fluvial	2 in PVC	25.0	8.50	Minimal Drawdown	
MW-43-75	Floodplain	462.71	65 - 75	Fluvial	2 in PVC	75.0	9.00	Minimal Drawdown	
MW-43-90	Floodplain	462.76	80 - 90	Fluvial	2 in PVC	97.0	9.30	Minimal Drawdown	
MW-44-70	Floodplain	471.84	61 - 71	Fluvial	2 in PVC	70.0	18.80	Minimal Drawdown	
MW-44-115	Floodplain	471.94	105 - 115	Alluvial	2 in PVC	113.5	18.40	Minimal Drawdown	
MW-44-125	Floodplain	472.11	116 - 125	Alluvial	2 in PVC	128.8	18.10	Minimal Drawdown	
MW-45-095a	Floodplain	468.27	83 - 93	Fluvial	2 in PVC	97.0	18.30	Temp. pump	pressure transducer location
MW-46-175	Floodplain	482.16	165 - 175	Alluvial	2 in PVC	175.5	28.50	Minimal Drawdown	
MW-46-205	Floodplain	482.23	196.5 -	Alluvial	2 in PVC	206.5	28.90	Minimal Drawdown	
MW-47-55	Floodplain	484.04	45 - 55	Alluvial	2 in PVC	55.0	29.40	Minimal Drawdown	
MW-47-115	Floodplain	484.17	105 - 115	Alluvial	2 in PVC	115.0	29.80	Minimal Drawdown	
MW-48	East of Station	486.22	124 - 134	Bedrock	2 in PVC	138.0	31.20	Three Volume	low recharge well; typically purges dry at 1 casing volume
MW-49-135	Floodplain	483.97	125 - 135	Alluvial	1.5 in PVC	135.0	30.90	Minimal Drawdown	
MW-49-275	Floodplain	483.95	255 - 275	Alluvial	2 in PVC	274.7	31.10	Minimal Drawdown	
MW-49-365	Floodplain	484.01	346 - 366	Alluvial	2 in PVC	367.4	32.60	Minimal Drawdown	
MW-50-095	Route 66	496.49	85 - 95	Alluvial	2 in PVC	95.0	42.00	Minimal Drawdown	

TABLE A-1
Well Construction and Sampling Summary, Fourth Quarter 2016
Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

Well ID	Site Area	Measuring Point Elevation (ft amsl)	Well Screen Depth Interval (ft bgs)	Well Screen Lithology	Well Casing (inches)	Well Depth (ft bgs)	Depth to Water (ft btoc)	Sampling System	Remarks
GMP MONITORING WELLS									
MW-50-200	Route 66	496.35	190 - 200	Alluvial	2 in PVC	204.5	43.10	Minimal Drawdown	
MW-51	Route 66	501.56	97 - 112	Alluvial	4 in PVC	113.3	47.50	Minimal Drawdown	
MW-52D	Floodplain	462.16	85 - 87	Fluvial	0.75 in MLABS	89.5	14.90	Fixed Volume	
MW-52M	Floodplain	462.16	66 - 68	Fluvial	0.75 in MLABS	70.5	11.30	Fixed Volume	
MW-52S	Floodplain	462.16	47 - 49	Fluvial	0.75 in MLABS	51.5	9.80	Fixed Volume	
MW-53D	Floodplain	461.32	123.5 - 125	Fluvial	0.75 in MLABS	---	14.30	Fixed Volume	
MW-53M	Floodplain	461.32	98.5 - 100	Fluvial	0.75 in MLABS	---	13.70	Fixed Volume	
MW-54-85	Arizona	466.10	77 - 87	Fluvial	2 in PVC	93.2	11.30	Minimal Drawdown	
MW-54-140	Arizona	465.98	128 - 138	Fluvial	2 in PVC	138.0	11.30	Minimal Drawdown	
MW-54-195	Arizona	466.32	185 - 195	Fluvial	2 in PVC	195.0	12.10	Minimal Drawdown	
MW-55-45	Arizona	465.84	37 - 47	Fluvial	2 in PVC	54.0	10.20	Minimal Drawdown	
MW-55-120	Arizona	465.82	108 - 118	Fluvial	2 in PVC	120.3	10.10	Minimal Drawdown	Redeveloped Q3 of 2015. Being sampled quarterly for 1 year.
MW-56D	Arizona	461.36	103.5 -	Fluvial	0.75 in MLABS	---	16.30	Fixed Volume	
MW-56M	Arizona	461.36	73.5 - 75.5	Fluvial	0.75 in MLABS	---	15.20	Fixed Volume	
MW-56S	Arizona	461.36	33.5 - 35.5	Fluvial	0.75 in MLABS	---	14.10	Fixed Volume	
MW-57-050	East Ravine	508.76	40 - 50	Bedrock	2 in Sch 40 PVC	50.0	51.60	Three Volume	
MW-57-070	East Ravine	509.37	55 - 70	Bedrock	2 in Sch 40 PVC	70.0	53.40	Three Volume	
MW-57-185	East Ravine	508.97	70 - 184	Bedrock	4 in Sch 40 PVC	184.7	52.50	Three Volume	
MW-58-065	East Ravine	523.26	54 - 64	Bedrock	2 in Sch 40 PVC	66.0	67.50	Three Volume	
MW-58BR	East Ravine	---	0 - 0	Bedrock	---	---	67.80	Minimal Drawdown	
MW-59-100	East Ravine	541.61	86 - 101	Alluvial	2 in Sch 40 PVC	101.0	85.61	Minimal Drawdown	
MW-60-125	East Ravine	555.47	103 - 123	Bedrock	2 in Sch 40 PVC	122.5	99.80	Three Volume	

TABLE A-1
Well Construction and Sampling Summary, Fourth Quarter 2016
Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

Well ID	Site Area	Measuring Point Elevation (ft amsl)	Well Screen Depth Interval (ft bgs)	Well Screen Lithology	Well Casing (inches)	Well Depth (ft bgs)	Depth to Water (ft btoc)	Sampling System	Remarks
GMP MONITORING WELLS									
MW-60BR-245	East Ravine	554.95	136 - 245	Bedrock	5 in	244.1	99.80	Three Volume	
MW-61-110	East Ravine	544.03	92 - 112	Bedrock	2 in Sch 40 PVC	112.5	88.60	Three Volume	
MW-62-065	East Ravine	503.56	44.5 - 64.5	Bedrock	2 in Sch 40 PVC	67.4	48.80	Three Volume	
MW-62-110	East Ravine	504.05	85 - 110	Bedrock	---	110.0	37.50	Flute	
MW-62-190	East Ravine	504.05	155 - 192	Bedrock	---	190.0	36.50	Flute	
MW-63-065	East Ravine	504.47	46 - 66	Bedrock	2 in Sch 40 PVC	65.6	50.20	Three Volume	
MW-64BR	East Ravine	575.60	2 - 258	Bedrock	3 in	260.0	120.60	Minimal Drawdown	
MW-65-160	Topock	596.59	150 - 160	Alluvial	2 in PVC	160.1	141.20	Minimal Drawdown	
MW-65-225	Topock	596.58	215 - 225	Alluvial	2 in PVC	225.1	141.20	Minimal Drawdown	
MW-66-165	Topock	586.16	142 - 162	Alluvial	2 in PVC	162.1	130.60	Minimal Drawdown	
MW-66-230	Topock	586.22	218 - 228	Alluvial	2 in PVC	228.1	131.20	Minimal Drawdown	
MW-66BR-270	Topock	586.15	248 - 271	Bedrock	5 in	270.6	153.00	Three Volume	
MW-67-185	Topock	625.91	177 - 187	Alluvial	2 in	186.7	170.03	Minimal Drawdown	
MW-67-225	Topock	625.83	210 - 225	Alluvial	2 in PVC	225.0	170.40	Minimal Drawdown	
MW-67-260	Topock	625.81	250 - 260	Alluvial	2 in PVC	260.0	170.50	Minimal Drawdown	
MW-68-180	Topock	621.17	165 - 180	Alluvial	2 in PVC	180.1	165.90	Minimal Drawdown	
MW-68-240	Topock	621.17	220 - 240	Alluvial	2 in PVC	240.1	166.10	Minimal Drawdown	
MW-68BR-280	Topock	620.64	257 - 279	Bedrock	5 in	278.2	165.30	Three Volume	
MW-69-195	Topock	631.36	176 - 196	Bedrock	2 in	195.5	175.50	Three Volume	

TABLE A-1
Well Construction and Sampling Summary, Fourth Quarter 2016
Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

Well ID	Site Area	Measuring Point Elevation (ft amsl)	Well Screen Depth Interval (ft bgs)	Well Screen Lithology	Well Casing (inches)	Well Depth (ft bgs)	Depth to Water (ft btoc)	Sampling System	Remarks
GMP MONITORING WELLS									
MW-70-105	East Ravine	541.47	85 - 105	Bedrock	2 in PVC	107.8	84.80	Three Volume	
MW-70BR-225	East Ravine	539.84	120 - 227	Bedrock	5 in	229.3	83.50	Three Volume	
MW-71-035	East Ravine	483.69	26 - 36	Alluvial	2 in	36.2	28.60	Minimal Drawdown	
MW-72-080	East Ravine	513.32	60 - 80	Bedrock	2 in	80.1	59.10	Three Volume	
MW-72BR-200	East Ravine	513.79	107 - 200	Bedrock	---	200.0	58.80	Three Volume	
MW-73-080	East Ravine	505.84	60.2 - 80.2	Bedrock	2 in	79.9	51.40	Three Volume	
MW-74-240	East Ravine	672.34	220 - 240	Bedrock	2 in	239.7	215.90	Three Volume	
OW-03D	West Mesa	558.63	242 - 262	Alluvial	2 in Sch 40 PVC	272.5	102.10	Minimal Drawdown	
OW-03M	West Mesa	558.9	180 - 200	Alluvial	2 in Sch 40 PVC	200.3	102.30	Minimal Drawdown	
OW-03S	West Mesa	558.58	86 - 116	Alluvial	2 in Sch 40 PVC	116.3	102.10	Three Volume	
PGE-07BR	MW-24 Bench	---	249 - 300	Bedrock	7 in	300.0	110.50	Three Volume	inactive supply
PGE-08	Station	596.01	405 - 554	Bedrock	6.75 in Steel	564.0	141.10	Three Volume	inactive injection
Other Site Wells not in GMP									
MW-01	New Ponds	661.76	201 - 211	Alluvial	4 in PVC	217.0	205.20	Three Volume	active PG&E pond monitoring well
MW-03	New Ponds	650.51	193 - 203	Alluvial	4 in PVC	205.0	195.40	Three Volume	active PG&E pond monitoring well
MW-04	New Ponds	625.73	164.5 -	Alluvial	4 in PVC	176.3	170.15	Three Volume	active PG&E pond monitoring well
MW-05	New Ponds	635.69	175.9 -	Alluvial	4 in PVC	186.2	179.60	Three Volume	active PG&E pond monitoring well
MW-06	New Ponds	642.84	184.5 -	Alluvial	4 in PVC	194.9	185.81	Three Volume	active PG&E pond monitoring well
MW-07	New Ponds	631.91	172.7 -	Alluvial	4 in PVC	185.0	175.71	Three Volume	active PG&E pond monitoring well
MW-08	New Ponds	627.54	169 - 178	Alluvial	4 in PVC	179.9	170.61	Three Volume	active PG&E pond monitoring well

TABLE A-1

Well Construction and Sampling Summary, Fourth Quarter 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,

PG&E Topock Compressor Station, Needles, California

Well ID	Site Area	Measuring Point Elevation (ft amsl)	Well Screen Depth Interval (ft bgs)	Well Screen Lithology	Well Casing (inches)	Well Depth (ft bgs)	Depth to Water (ft btoc)	Sampling System	Remarks
Test and Extraction Wells									
PE-01	Floodplain	457.52	79 - 89	Fluvial	6 in Sch 40	99.0	16.40	Extraction Well	active IM extraction well
TW-01	Plan B Test	620.55	169 - 269	Alluvial	5 in PVC	271.0	160.00	Three Volume	inactive pilot test well
TW-02D	MW-20 bench	493.29	113 - 148	Alluvial	6 in Sch 80 PVC	150.0	69.30	Extraction Well	inactive IM extraction well
TW-02S	MW-20 bench	499.05	42.5 - 92.5	Alluvial	6 in Sch 80 PVC	97.5	40.90	Extraction Well	inactive IM extraction well
TW-03D	MW-20 bench	498.09	111 - 156	Alluvial	8 in PVC	156.0	46.50	Extraction Well	active IM extraction well
TW-04	Floodplain	484.11	210 - 250	Alluvial	4 in PVC	255.0	31.10	Three Volume	
TW-05	Route 66	496.30	110 - 150	Alluvial	4 in PVC	155.0	43.00	Three Volume	
Water Supply Wells									
Park Moabi-3	Park Moabi	518.55	80 - 200	Alluvial	8 in Steel	252.0	61.30	Active supply well	call Park Ranger to schedule sampling
Park Moabi-4	Park Moabi	---	93 - 140	Alluvial	Steel	---	---	Active supply well	

Notes:

amsl = above mean sea level. bgs = below ground surface. btoc = below top of casing.

btoc = below top of well casing

CD pump = dedicated constant-discharge electric submersible pump. Ded. RF = dedicated Redi - Flo submersible pump.

Flute = Flexible Liner Underground Technologies. GMP = Groundwater Monitoring Program.

NA = not known or available. PVC = polyvinyl chloride.

Redi-Flo AR = adjustable-rate electric submersible pump. Temp pump = temporary pump.

Depth to water shown is the most recently measured depth to water.

All GMP wells except low recharge wells, active IM extraction wells, and Park Moabi wells are purged and sampled using well-volume method.

Table A-2
Well Inspection Log, Fourth Quarter 2016
Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

Well/ Piezometer	Inspection Date	Survey Mark Present? (Yes/No)	Standing or Ponded Water? (Yes/No)	Lock in Place? (Yes/No)	Evidence of Well Subsidence? (Yes/No)	Well Labeled on Casing or Pad? (Yes/No)	Traffic Poles Intact? (Yes/No)	Concrete Pad Intact? (Yes/No)	Erosion Around Wellhead? (Yes/No)	Steel Casing Intact? (Yes/No)	PVC Cap Present? (Yes/No)	Standing Water in Annulus? (Yes/No)	Well Casing Intact? (Yes/No)	Photo taken this quarter? (Yes/No)	Required Actions	Action Completed? (Yes/No)	Action Completed Date	Notes
MW-09	12/07/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-10	12/07/2016	Yes	No	Yes	No	Yes	Yes	Yes	--	Yes	Yes	--	Yes	Yes				
MW-11	12/07/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-12	12/07/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-13	12/08/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-14	12/08/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-15	12/12/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-18	12/08/2016	Yes	No	Yes	--	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-19	12/08/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-20-070	12/09/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-20-100	12/09/2016	Yes	No	No	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-20-130	12/09/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-21	12/14/2016	Yes	No	No	No	Yes	NA	Yes	No	NA	Yes	No	Yes	Yes				
MW-22	12/06/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-23-060	12/14/2016	Yes	No	No	No	Yes	NA	Yes	No	NA	Yes	No	Yes	Yes				
MW-23-080	12/14/2016	Yes	No	No	No	Yes	NA	Yes	No	NA	Yes	No	Yes	Yes				
MW-24A	12/06/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-24B	12/06/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-24BR	12/06/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-25	12/08/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-26	12/08/2016	Yes	No	Yes	No	Yes	NA	Yes	No	NA	Yes	No	Yes	Yes				
MW-27-020	12/06/2016	Yes	No	Yes	No	Yes	NA	Yes	No	Yes	Yes	No	Yes	Yes				
MW-27-060	12/06/2016	Yes	--	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-27-085	12/06/2016	Yes	No	Yes	No	Yes	NA	Yes	No	Yes	Yes	No	Yes	Yes				
MW-28-025	12/08/2016	Yes	No	Yes	No	Yes	NA	Yes	No	Yes	Yes	No	Yes	Yes				
MW-28-090	12/08/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-29	12/08/2016	Yes	No	Yes	No	Yes	NA	Yes	No	Yes	Yes	No	Yes	Yes				
MW-30-030	12/06/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-30-050	12/06/2016	Yes	No	Yes	No	Yes	NA	Yes	No	Yes	Yes	No	Yes	Yes				
MW-31-060	12/09/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-31-135	12/09/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-32-020	12/06/2016	Yes	No	Yes	No	Yes	NA	Yes	No	Yes	Yes	No	Yes	Yes				
MW-32-035	12/06/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-32-035	12/06/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-33-040	12/08/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-33-090	12/08/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-33-150	12/08/2016	Yes	No	Yes	No	Yes	NA	Yes	No	Yes	No	No	Yes	Yes				
MW-33-210	12/08/2016	Yes	No	Yes	No	Yes	No	Yes	No	Yes	Yes	No	Yes	Yes				
MW-34-055	12/06/2016	Yes	No	Yes	No	Yes	NA	Yes	No	Yes	Yes	No	Yes	Yes				
MW-34-080	12/06/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-34-100	12/06/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-35-060	12/09/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-35-135	12/09/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-36-020	12/07/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-36-040	12/07/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-36-050	12/07/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-36-070	12/07/2016	Yes	No	Yes	No	Yes	NA	Yes	No	Yes	Yes	No	Yes	Yes				
MW-36-090	12/07/2016	Yes	No	Yes	No	Yes	NA	Yes	No	Yes	Yes	No	Yes	Yes				
MW-36-100	12/07/2016	Yes	No	Yes	No	Yes	NA	Yes	No	Yes	Yes	No	Yes	Yes				
MW-37D	12/08/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-37S	12/08/2016	Yes	No	Yes	No	Yes	NA	Yes	No	Yes	Yes	No	Yes	Yes				
MW-38D	12/07/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-38S	12/07/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-39-040	12/07/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-39-050	12/07/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-39-060	12/07/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-39-070	12/07/2016	Yes	No	Yes	No	Yes	NA	Yes	No	Yes	Yes	No	Yes	Yes				
MW-39-080	12/07/2016	Yes	No	Yes	No	Yes	NA	Yes	No	Yes	Yes	No	Yes	Yes				
MW-39-100	12/07/2016	Yes	No	Yes	No	Yes	NA	Yes	No	Yes	Yes	No	Yes	Yes				

Table A-2
Well Inspection Log, Fourth Quarter 2016
Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide
Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

Well/ Piezometer	Inspection Date	Survey Mark Present? (Yes/No)	Standing or Ponded Water? (Yes/No)	Lock in Place? (Yes/No)	Evidence of Well Subsidence? (Yes/No)	Well Labeled on Casing or Pad? (Yes/No)	Traffic Poles Intact? (Yes/No)	Concrete Pad Intact? (Yes/No)	Erosion Around Wellhead? (Yes/No)	Steel Casing Intact? (Yes/No)	PVC Cap Present? (Yes/No)	Standing Water in Annulus? (Yes/No)	Well Casing Intact? (Yes/No)	Photo taken this quarter? (Yes/No)	Required Actions	Action Completed? (Yes/No)	Action Completed Date	Notes
MW-41D	12/08/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-41M	12/08/2016	Yes	No	Yes	No	Yes	NA	Yes	No	Yes	Yes	No	Yes	Yes				
MW-41S	12/08/2016	Yes	No	Yes	No	Yes	NA	Yes	No	Yes	Yes	No	Yes	Yes				
MW-42-030	12/06/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-42-055	12/06/2016	Yes	No	Yes	No	Yes	NA	Yes	No	Yes	Yes	No	Yes	Yes				
MW-42-065	12/06/2016	Yes	No	Yes	No	Yes	NA	Yes	No	Yes	Yes	No	Yes	Yes				
MW-43-025	12/07/2016	Yes	No	Yes	No	Yes	NA	Yes	No	Yes	Yes	No	Yes	Yes				
MW-43-075	12/09/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-43-090	12/09/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-44-070	12/07/2016	Yes	No	Yes	No	Yes	NA	Yes	No	Yes	Yes	No	Yes	Yes				
MW-44-115	12/07/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-44-125	12/07/2016	Yes	No	Yes	No	Yes	NA	Yes	No	Yes	Yes	No	Yes	Yes				
MW-46-175	12/08/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-46-205	12/08/2016	Yes	No	Yes	No	Yes	No	Yes	No	Yes	Yes	No	Yes	Yes				
MW-47-055	12/08/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-47-115	12/08/2016	Yes	No	Yes	No	Yes	NA	Yes	No	Yes	Yes	No	Yes	Yes				
MW-48	12/12/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-49-135	12/08/2016	Yes	No	Yes	No	Yes	No	Yes	No	Yes	Yes	No	Yes	Yes				
MW-49-275	12/08/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-49-365	12/08/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-50-095	12/09/2016	Yes	No	Yes	No	Yes	NA	Yes	No	Yes	Yes	No	Yes	Yes				
MW-50-200	12/09/2016	Yes	No	Yes	No	Yes	NA	Yes	No	Yes	Yes	No	Yes	Yes				
MW-51	12/09/2016	Yes	No	Yes	No	Yes	NA	Yes	No	NA	Yes	No	Yes	Yes				
MW-52D	12/05/2016	Yes	No	Yes	No	Yes	NA	Yes	No	Yes	Yes	No	Yes	Yes				
MW-52M	12/05/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-52S	12/05/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-53D	12/05/2016	Yes	No	Yes	No	Yes	NA	Yes	No	Yes	Yes	No	Yes	Yes				
MW-53M	12/05/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-54-085	12/15/2016	Yes	No	Yes	No	Yes	NA	Yes	No	NA	Yes	No	Yes	Yes				
MW-54-140	12/15/2016	Yes	No	Yes	No	Yes	NA	Yes	No	NA	Yes	No	Yes	Yes				
MW-54-195	12/15/2016	Yes	No	Yes	No	Yes	NA	Yes	No	NA	Yes	No	Yes	Yes				
MW-55-045	12/15/2016	Yes	No	Yes	No	Yes	NA	Yes	No	NA	Yes	No	Yes	Yes				
MW-55-120	12/15/2016	Yes	No	Yes	No	Yes	NA	Yes	No	Yes	Yes	No	Yes	Yes				
MW-56D	12/14/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-56M	12/14/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-56S	12/14/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-57-050	12/13/2016	Yes	No	No	Yes	No	Yes	Yes	No	NA	Yes	No	Yes	Yes				
MW-57-070	12/13/2016	Yes	No	No	No	Yes	No	Yes	No	NA	Yes	No	Yes	Yes				
MW-57-185	12/13/2016	Yes	No	No	No	Yes	No	Yes	No	NA	Yes	No	Yes	Yes				
MW-58-065	12/13/2016	Yes	No	Yes	No	Yes	NA	Yes	No	Yes	Yes	No	Yes	Yes				
MW-58BR	12/13/2016	Yes	No	Yes	No	Yes	NA	Yes	No	Yes	Yes	No	Yes	Yes				
MW-59-100	12/07/2016	Yes	No	Yes	No	Yes	NA	Yes	No	Yes	Yes	No	Yes	Yes				
MW-60-125	12/14/2016	Yes	No	No	No	Yes	NA	Yes	No	NA	Yes	No	Yes	Yes				
MW-60BR-245	12/13/2016	Yes	No	Yes	No	Yes	NA	Yes	No	NA	Yes	No	Yes	Yes				
MW-61-110	12/13/2016	Yes	No	No	No	Yes	NA	Yes	No	NA	Yes	No	Yes	Yes				
MW-62-065	12/13/2016	Yes	No	No	No	Yes	NA	Yes	No	NA	Yes	No	Yes	Yes				
MW-62-110	12/13/2016	Yes	No	No	No	Yes	No	Yes	No	NA	NA	No	Yes	Yes				
MW-62-190	12/13/2016	NA	No	No	No	Yes	NA	Yes	No	NA	NA	No	Yes	Yes				
MW-63-065	12/13/2016	Yes	No	NA	No	No	NA	Yes	No	Yes	Yes	No	Yes	Yes				
MW-64BR	12/13/2016	Yes	No	Yes	No	Yes	NA	Yes	No	NA	Yes	No	Yes	Yes				
MW-65-160	12/06/2016	Yes	No	Yes	No	Yes	NA	Yes	No	NA	Yes	No	Yes	Yes				
MW-65-225	12/06/2016	Yes	No	No	No	Yes	NA	Yes	No	NA	Yes	No	Yes	Yes				
MW-66-165	12/05/2016	Yes	No	Yes	No	Yes	NA	Yes	No	NA	Yes	No	Yes	Yes				
MW-66-230	12/05/2016	Yes	No	Yes	No	Yes	NA	Yes	No	NA	Yes	No	Yes	Yes				
MW-66BR-270	12/05/2016	Yes	Yes	Yes	No	Yes	NA	Yes	No	NA	Yes	No	Yes	Yes				
MW-67-185	12/05/2016	Yes	No	Yes	No	Yes	NA	Yes	No	NA	Yes	No	Yes	Yes				

Table A-2
Well Inspection Log, Fourth Quarter 2016
Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide
Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

Well/ Piezometer	Inspection Date	Survey Mark Present? (Yes/No)	Standing or Ponded Water? (Yes/No)	Lock in Place? (Yes/No)	Evidence of Well Subsidence? (Yes/No)	Well Labeled on Casing or Pad? (Yes/No)	Traffic Poles Intact? (Yes/No)	Concrete Pad Intact? (Yes/No)	Erosion Around Wellhead? (Yes/No)	Steel Casing Intact? (Yes/No)	PVC Cap Present? (Yes/No)	Standing Water in Annulus? (Yes/No)	Well Casing Intact? (Yes/No)	Photo taken this quarter? (Yes/No)	Required Actions	Action Completed? (Yes/No)	Action Completed Date	Notes
MW-67-225	12/05/2016	Yes	No	No	No	Yes	NA	Yes	No	NA	Yes	No	Yes	Yes				
MW-67-260	12/05/2016	Yes	No	No	No	Yes	NA	Yes	No	NA	Yes	No	Yes	Yes				
MW-68-180	12/06/2016	Yes	No	Yes	No	Yes	NA	Yes	No	NA	Yes	No	Yes	Yes				
MW-68-240	12/06/2016	Yes	No	Yes	No	Yes	NA	Yes	No	NA	Yes	No	Yes	Yes				
MW-68BR-280	12/06/2016	Yes	No	Yes	No	Yes	NA	Yes	No	NA	Yes	No	Yes	Yes				
MW-69-195	12/06/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	NA	Yes	No	Yes	Yes				
MW-70-105	12/14/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-70BR-225	12/14/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-71-035	12/12/2016	Yes	No	No	No	Yes	No	Yes	No	Yes	Yes	No	Yes	Yes				
MW-72-080	12/12/2016	Yes	No	Yes	No	Yes	NA	Yes	No	NA	Yes	No	Yes	Yes				
MW-72BR-200	12/12/2016	Yes	No	Yes	No	Yes	NA	Yes	No	NA	Yes	No	Yes	Yes				
MW-73-080	12/12/2016	Yes	No	Yes	No	Yes	NA	Yes	No	NA	Yes	No	Yes	Yes				
MW-74-240	12/08/2016	Yes	No	Yes	No	Yes	NA	Yes	No	NA	Yes	No	Yes	Yes				
OW-03D	12/08/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
OW-03M	12/08/2016	Yes	No	Yes	No	Yes	Yes	Yes	No		Yes	No	Yes	Yes				
OW-03S	12/08/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
PE-01	12/06/2016	NA	NA	Yes	No	Yes	NA	Yes	No	NA	NA	NA	Yes	No				
PGE-07BR	12/06/2016	Yes	No	Yes	No	Yes	Yes	--	No	Yes	Yes	No	Yes	Yes				
PGE-08	12/07/2016	Yes	No	Yes	No	Yes	NA	Yes	No	NA	Yes	No	Yes	Yes				
PM-03	12/09/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	NA	No	Yes	Yes				
PM-04	12/09/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	NA	No	--	Yes				
TW-02D	12/13/2016	NA	No	NA	No	Yes	NA	NA	No	NA	NA	No	Yes	Yes				
TW-02S	12/13/2016	NA	No	NA	No	Yes	NA	Yes	No	NA	NA	No	Yes	Yes				
TW-03D	12/06/2016	NA	NA	NA	No	Yes	NA	NA	No	NA	NA	NA	Yes	No				
MW-38S-SMT	12/07/2016	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				
MW-38D-SMT	12/07/2016	Yes	No	--	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes				

APPENDIX B

Lab Reports, November through December 2016 (Provided on CD Only with Hard Copy Submittal)

APPENDIX C

Chromium, Molybdenum, Nitrate, and Selenium Concentration Graphs

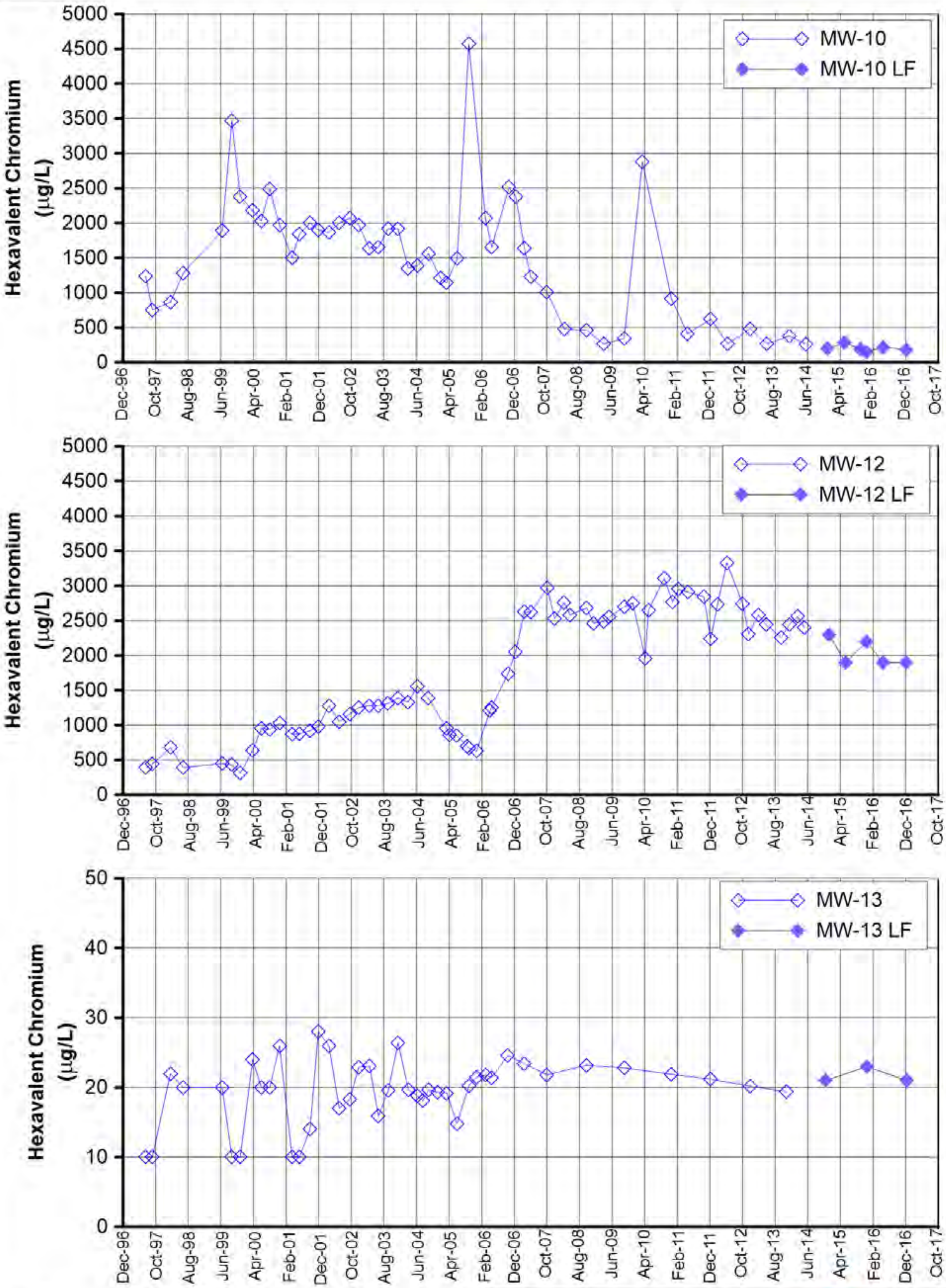
Table C-1
Chromium Concentrations of Wells within Approximately 800 feet of TW-3D Compared to the Maximum Detected Chromium Concentrations from 2014
Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

	Hexavalent Chromium		Total Dissolved Chromium		
Location ID	**Maximum 2014 Hexavalent Chromium Concentration and New Trigger Levels (µg/L)**	**2016 Fourth Quarter Hexavalent Chromium Result (µg/L)**	**Maximum 2014 Total Dissolved Chromium Concentration and New Trigger Levels (µg/L)**	**2016 Fourth Quarter Total Dissolved Chromium Result (µg/L)**	**Trigger Level Exceeded (Yes if triggered - blank if not)**
Shallow Zone Wells					
MW-20-070	2,200	1,800	2,400	1,900	
MW-26	2,400	2,500	2,300	2,500	Y
MW-27-020	ND (0.20)	ND (0.2)	ND (1.0)	ND (1)	
MW-28-025	ND (0.20)	ND (0.2)	ND (1.0)	ND (1)	
MW-30-030	0.21	ND (1)	ND (1.0)	ND (1)	
MW-31-060	600	590	660	590	
MW-32-020	ND (1.0)	ND (1)	ND (5.0)	ND (5)	
MW-32-035	ND (1.0)	ND (0.2)	ND (1.0)	ND (1)	
MW-33-040	0.28	ND (1)	ND (1.0)	ND (1)	
MW-36-020	ND (0.20)	ND (0.2)	ND (1.0)	ND (1)	
MW-36-040	0.34	ND (0.2)	ND (1.0)	ND (1)	
MW-39-040	ND (0.20)	ND (0.2)	ND (1.0)	ND (1)	
MW-42-030	0.54	ND (0.2)	ND (1.0)	ND (1)	
MW-47-055	16	17	16	16	Y
Middle Zone Wells					
MW-20-100	2,900	1,400	2,900	1,600	
MW-27-060	ND (0.20)	ND (0.2)	ND (1.0)	ND (1)	
MW-30-050	ND (0.20)	ND (0.2)	ND (1.0)	ND (1)	
MW-33-090	13.3	5.2	15.5	4.8	
MW-34-055	ND (0.20)	ND (0.2)	ND (1.0)	ND (1)	
MW-36-050	ND (0.20)	ND (0.2)	ND (1.0)	ND (1)	
MW-36-070	ND (0.20)	ND (0.2)	ND (1.0)	ND (1)	
MW-39-050	ND (0.20)	ND (0.2)	ND (1.0)	ND (1)	
MW-39-060	ND (0.20)	ND (0.2)	ND (1.0)	ND (1)	
MW-39-070	ND (0.20)	ND (0.2)	ND (1.0)	ND (1)	
MW-42-055	0.35	ND (0.2)	2.8	1.4	
MW-42-065	ND (0.20)	ND (0.2)	ND (1.0)	ND (1)	
MW-44-070	ND (0.20)	ND (0.2)	ND (1.0)	ND (1)	
MW-51	4,800	4,200	4,800	4,100	
Deep Zone Wells					
MW-20-130	9,100	7,800	9,000	7,900	
MW-27-085	ND (1.0)	ND (0.2)	ND (1.0)	ND (1)	
MW-28-090	ND (0.20)	ND (0.2)	ND (1.0)	ND (1)	
MW-31-135	12	12	12	11	
MW-33-150	12 J	4.6	10.8	5.2	
MW-33-210	13	11	13.5	12	
MW-34-080	ND (0.20)	ND (0.2)	ND (1.0)	ND (1)	
MW-34-100	263	18	270	17	
MW-36-090	ND (0.20)	ND (0.2)	ND (1.0)	ND (1)	
MW-36-100	65	28	62	28	

Table C-1
Chromium Concentrations of Wells within Approximately 800 feet of TW-3D Compared to the Maximum Detected Chromium Concentrations from 2014
Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

	Hexavalent Chromium		Total Dissolved Chromium		
Location ID	**Maximum 2014 Hexavalent Chromium Concentration and New Trigger Levels (µg/L)**	**2016 Fourth Quarter Hexavalent Chromium Result (µg/L)**	**Maximum 2014 Total Dissolved Chromium Concentration and New Trigger Levels (µg/L)**	**2016 Fourth Quarter Total Dissolved Chromium Result (µg/L)**	**Trigger Level Exceeded (Yes if triggered - blank if not)**
MW-39-080	ND (0.20)	ND (0.2)	ND (1.0)	ND (1)	
MW-39-100	57	77	49	67	Y
MW-44-115	41.6	25	42.9	24	
MW-44-125	4.0 J	10	5.9	11	Y
MW-45-095a	13.7 (a)	---	14.2 (a)	---	
MW-46-175	46.3	16	46.1	16	
MW-46-205	5.5	ND (1)	4.8	ND (5)	
MW-47-115	24	17	20	18	
PE-01	5.6	2	6	1.7	
TW-04	7.4	---	6.5	---	

Notes:
--- = data were either not collected, not available or were rejected
J = concentration or reporting limit estimated by laboratory or data validation.
ug/L = micrograms per liter.
(a) = Result is the maximum from 2013



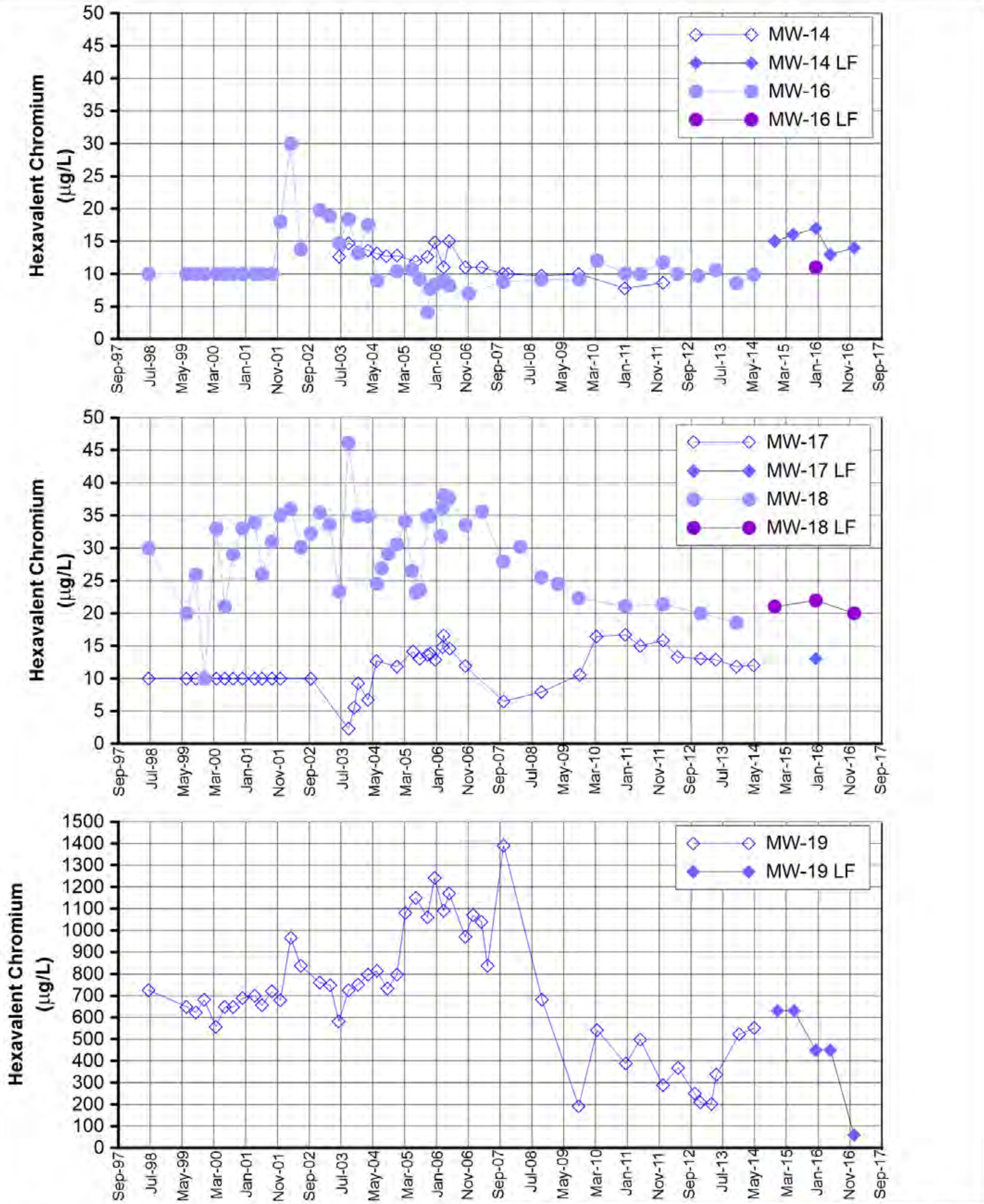
Notes:

LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

FIGURE C-1
HEXAVALENT CHROMIUM IN MW-10, MW-12, AND MW-13

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS



Notes:

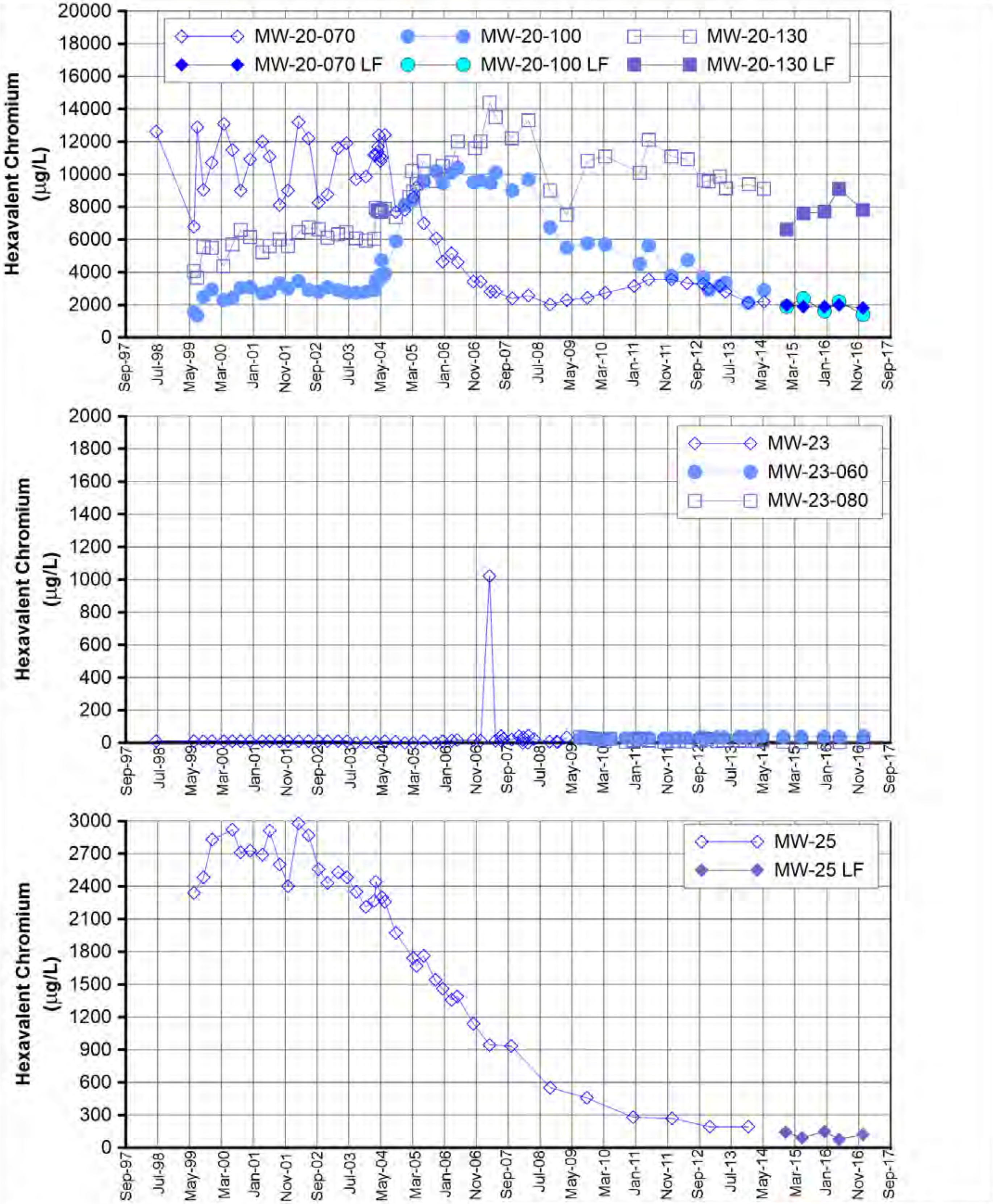
1. LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.
2. MW-16 and MW-17 are sampled biannually and were not sampled in 2016.

FIGURE C-2
HEXAVALENT CHROMIUM IN MW-14, MW-16, MW-17, MW-18, AND MW-19

ARCADIS

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

\\arcadis-us.com\officedata\Denver-CO-Technical\Aproject\PG&E - Groundwater Monitoring\Reporting\00_Arcadis_rpts\02_GMP_rpts\05_Q416



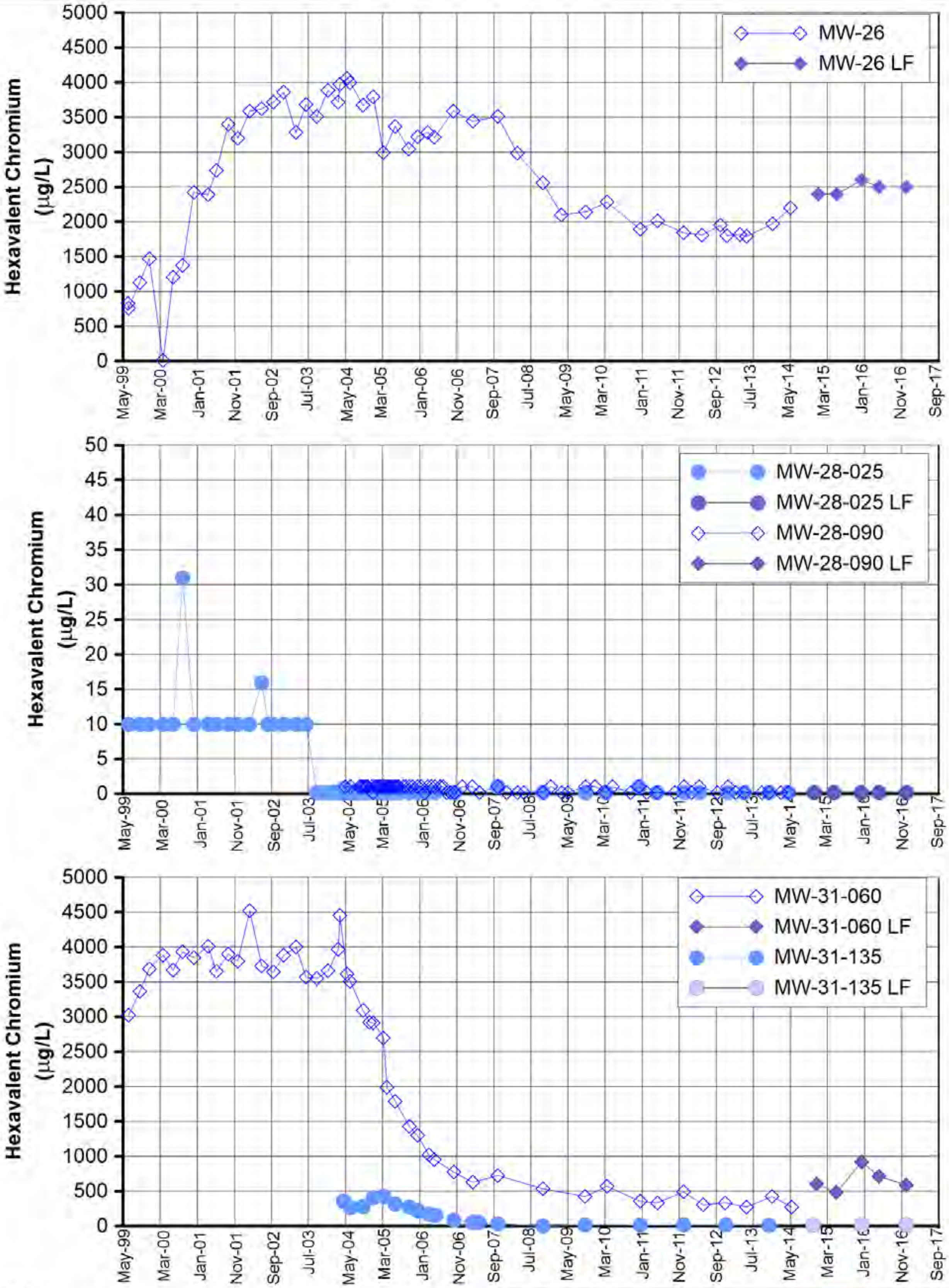
Notes:

LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

FIGURE C-3
HEXAVALENT CHROMIUM IN MW-20 AND MW-23 CLUSTERS AND MW-25

ARCADIS

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA



Notes:

1) The IM Contingency Plan and hexavalent chromium [Cr(VI)] trigger levels were updated July 17, 2008 (DTSC, 2008b).

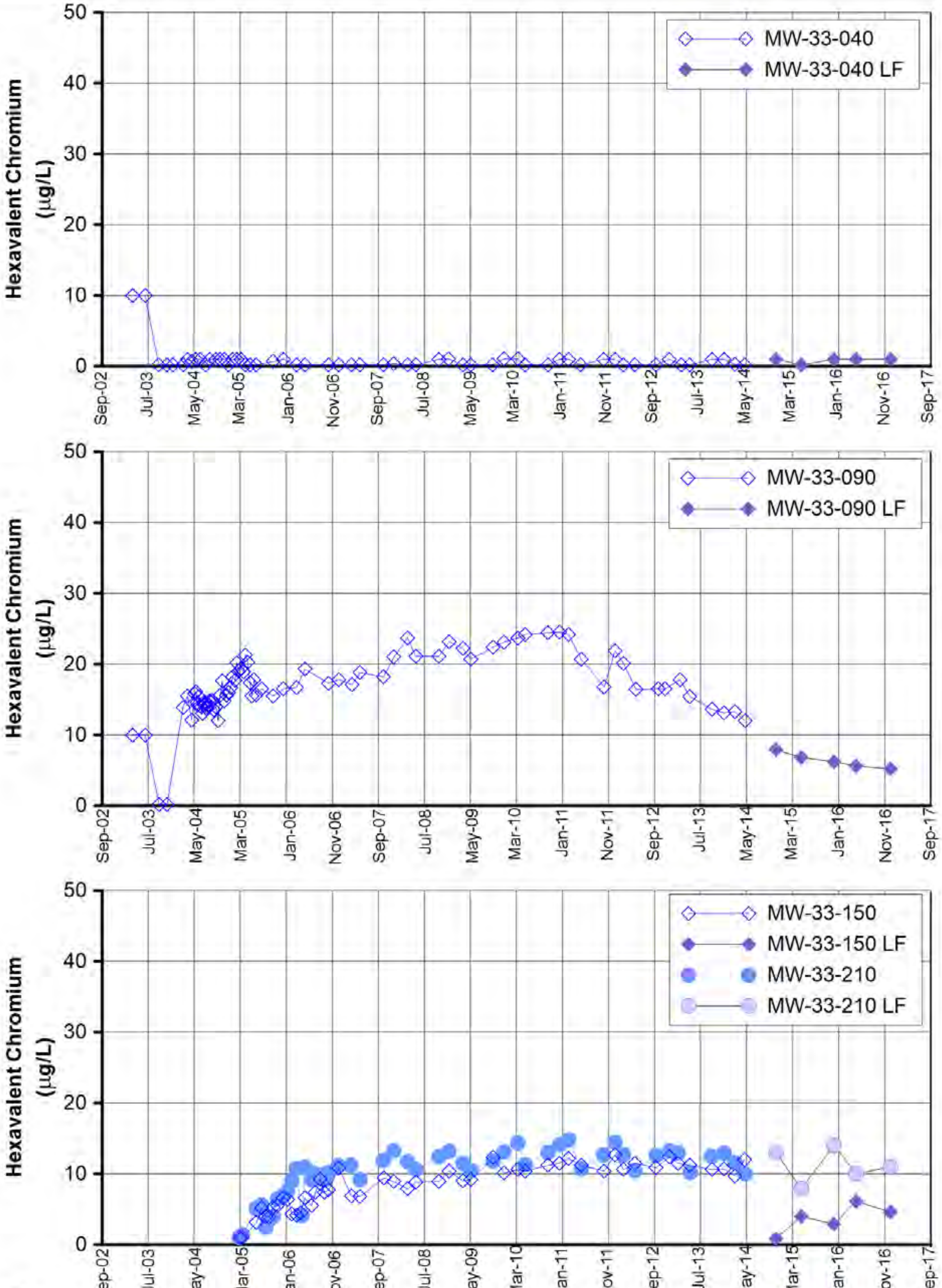
2) The trigger level for MW-28-090 is 20 µg/L.

LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

FIGURE C-4
HEXAVALENT CHROMIUM IN MW-26, MW-28, AND MW-31 CLUSTERS

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS



Notes:

1) The IM Contingency Plan and hexavalent chromium [Cr(VI)] trigger levels were updated July 17, 2008 (DTSC, 2008b).

2) The trigger level for MW-33-040 is 20 µg/L.

3) The trigger level for MW-33-090 is 25 µg/L.

4) The trigger level for MW-33-150 is 20 µg/L.

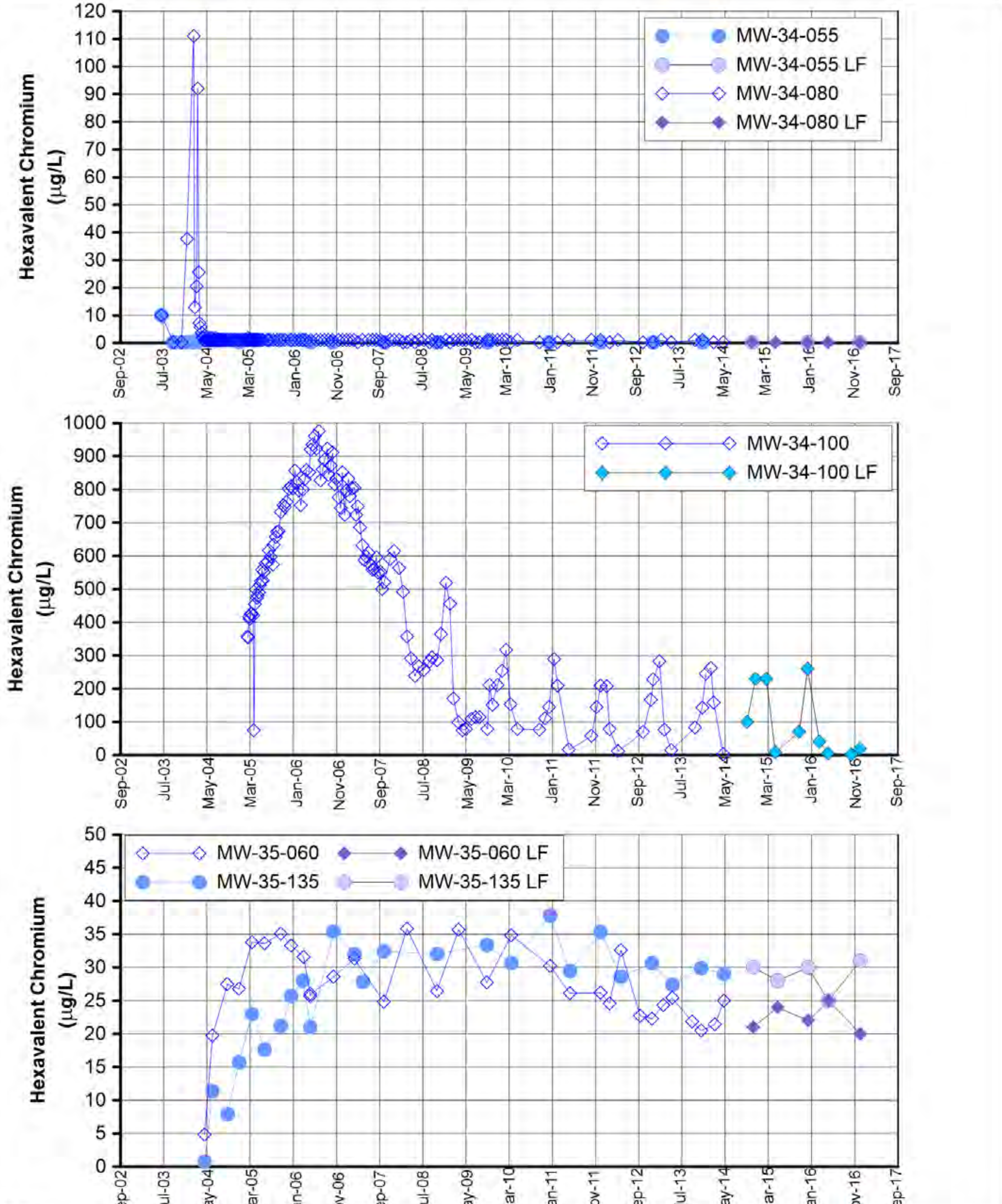
5) The trigger level for MW-33-210 is 20 µg/L.

LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

FIGURE C-5
HEXAVALENT CHROMIUM IN MW-33 CLUSTER

ARCADIS

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA



Notes:

1) The IM Contingency Plan and hexavalent chromium [Cr(VI)] trigger levels were updated July 17, 2008 (DTSC, 2008b).
2) The trigger level for MW-34-080 is 20 µg/L.
3) The trigger level for MW-34-100 is 750 µg/L.

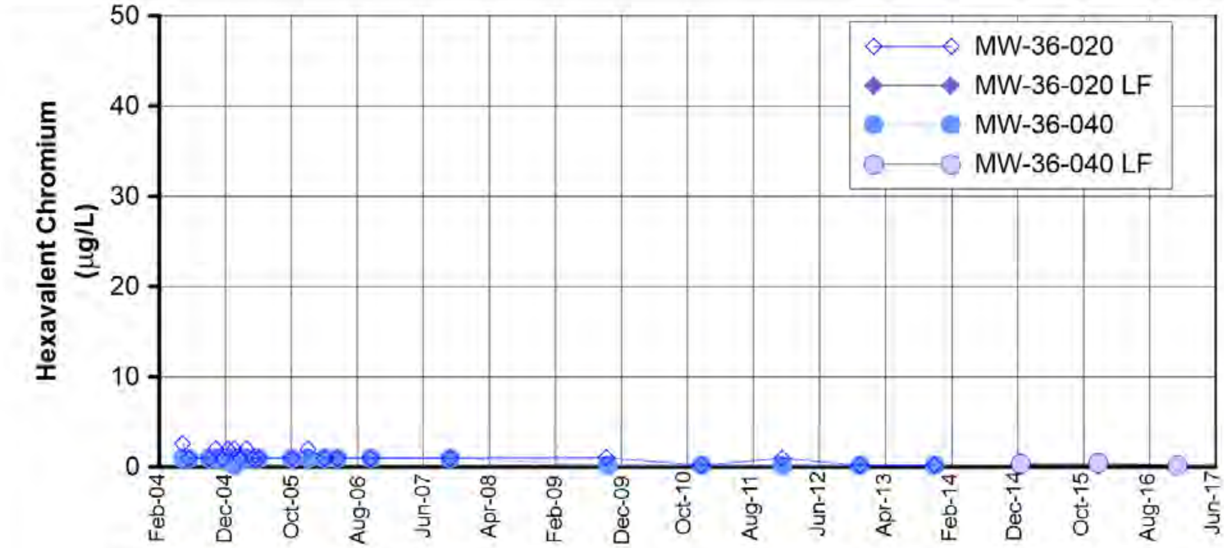
LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

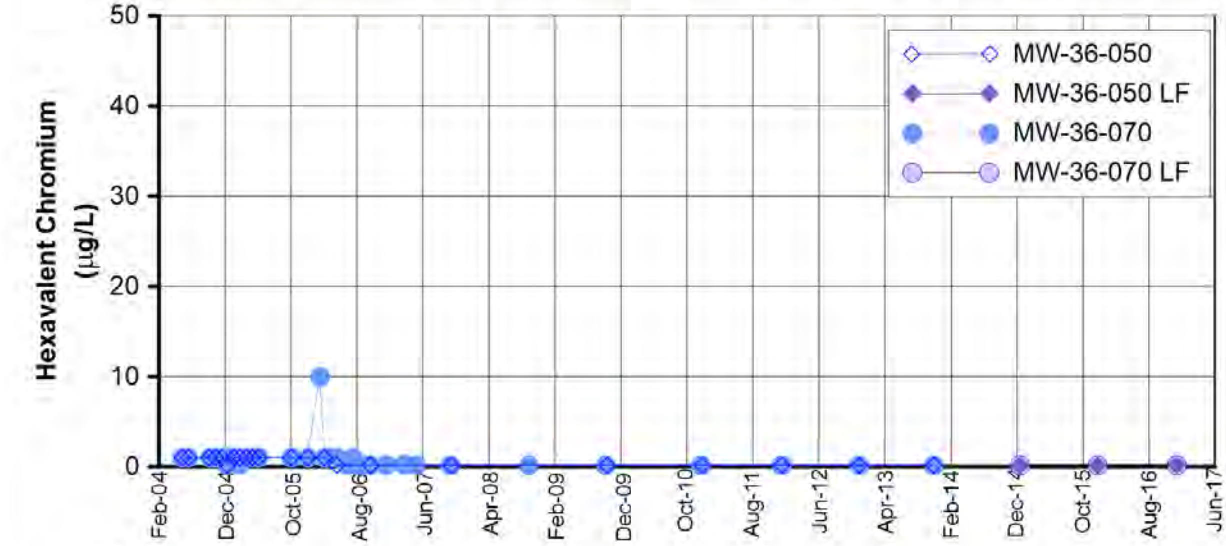
FIGURE C-6
HEXAVALENT CHROMIUM IN MW-34 AND MW-35 CLUSTERS

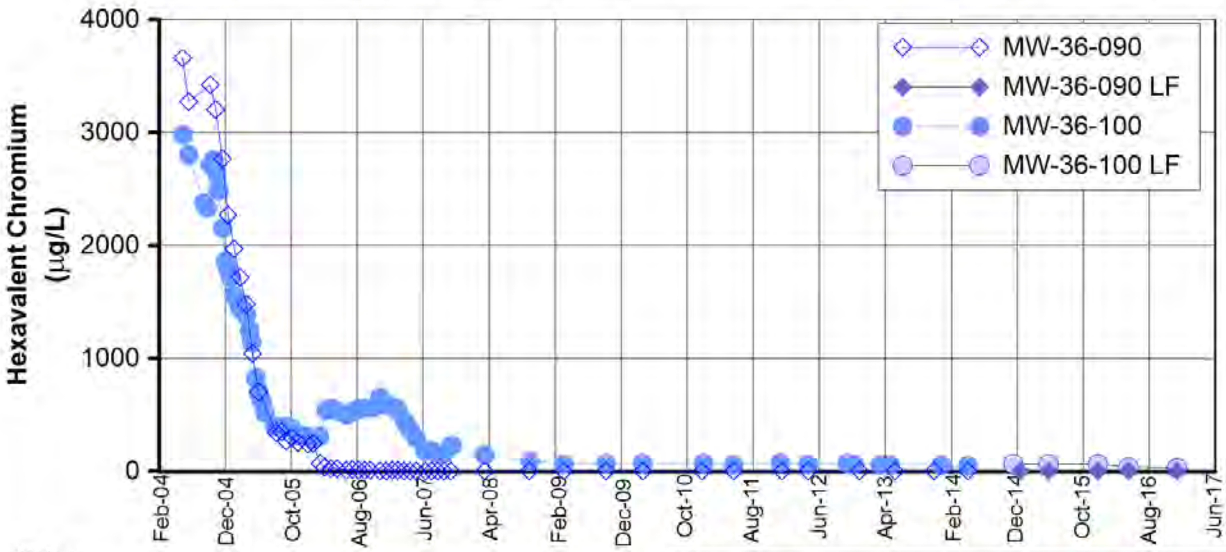
FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS

\\arcadis-us.com\officedata\Denver-CO-Technical\Aproject\PG&E - Groundwater Monitoring\Reporting\00_Arcadis_rpts\02_GMP_rpts\05_Q416







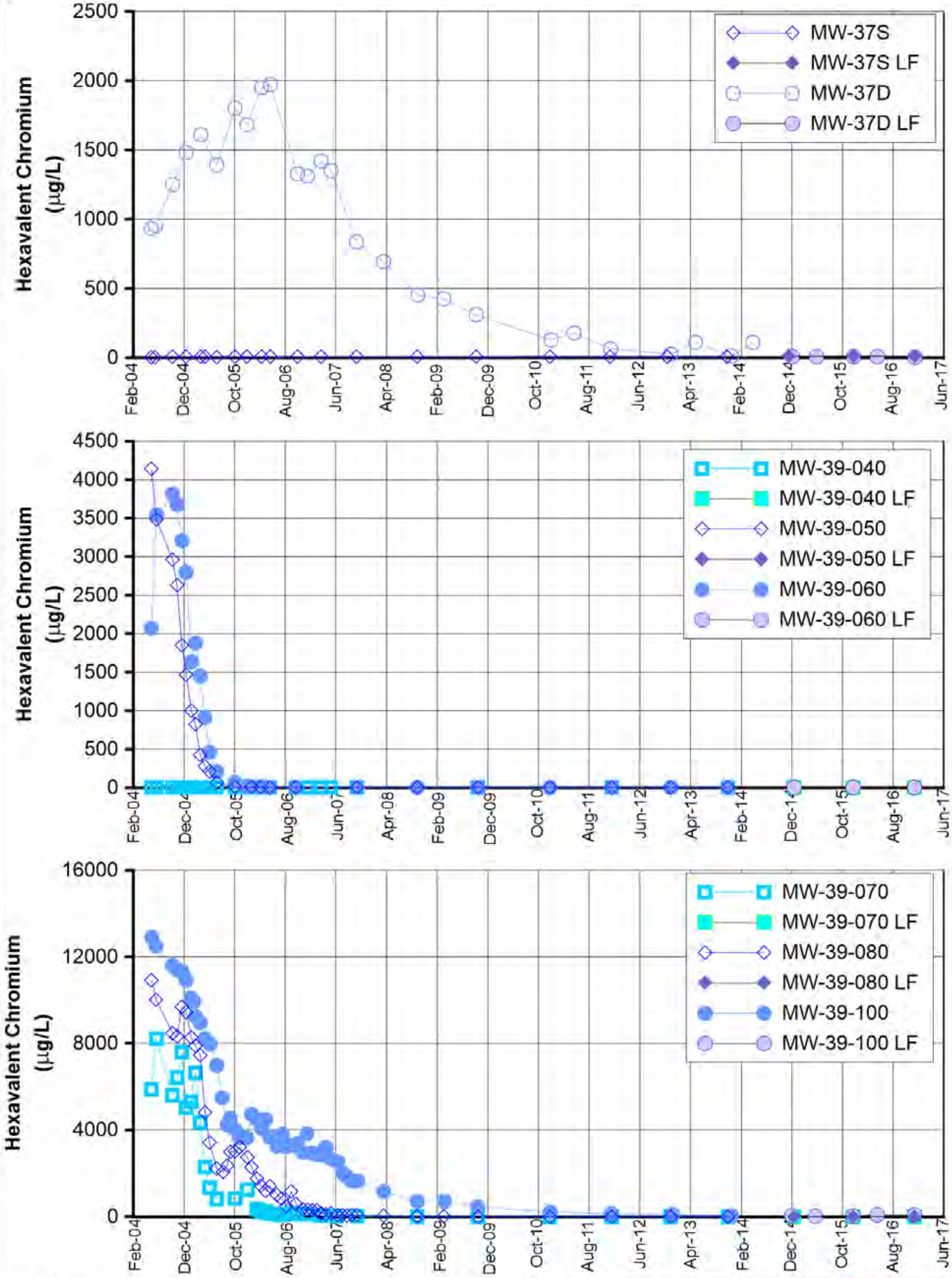
Notes:
1) The IM Contingency Plan and hexavalent chromium [Cr(VI)] trigger levels were updated July 17, 2008 (DTSC, 2008b).
2) The trigger level for MW-36-070 is 20 µg/L.

LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

FIGURE C-7
HEXAVALENT CHROMIUM IN MW-36 CLUSTER

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS



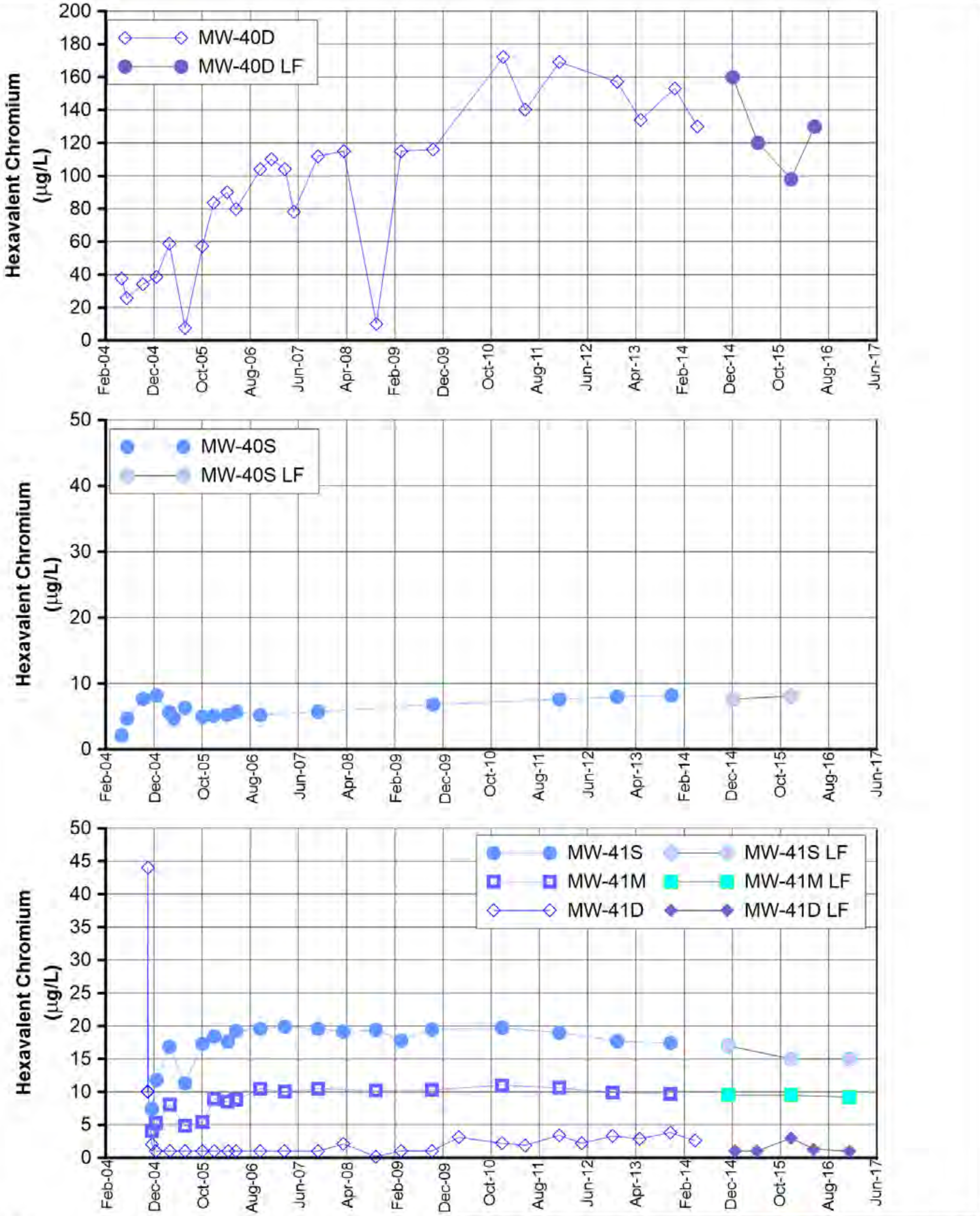
Notes:
1) The IM Contingency Plan and hexavalent chromium [Cr(VI)] trigger levels were updated July 17, 2008 (DTSC, 2008b).
2) The trigger level for MW-39-040 is 20 µg/L.

LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

FIGURE C-8
HEXAVALENT CHROMIUM IN MW-37 AND MW-39 CLUSTERS

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS



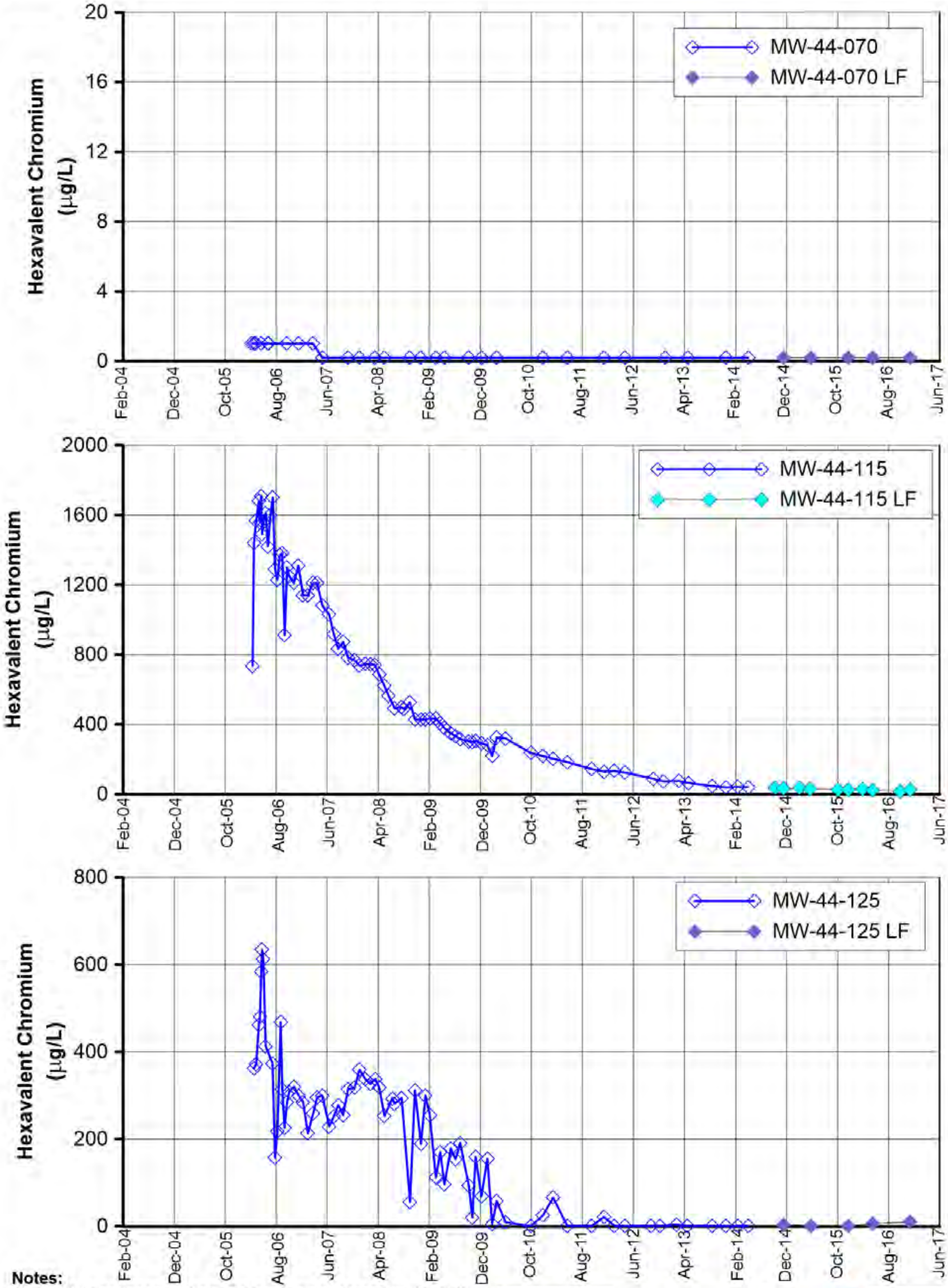
Notes:

1. LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.
2. MW-40D and MW-40S were not sampled during 4th Quarter 2016 due to traffic control issues.

FIGURE C-9
HEXAVALENT CHROMIUM IN MW-40 AND MW-41 CLUSTERS

ARCADIS

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA



Notes:

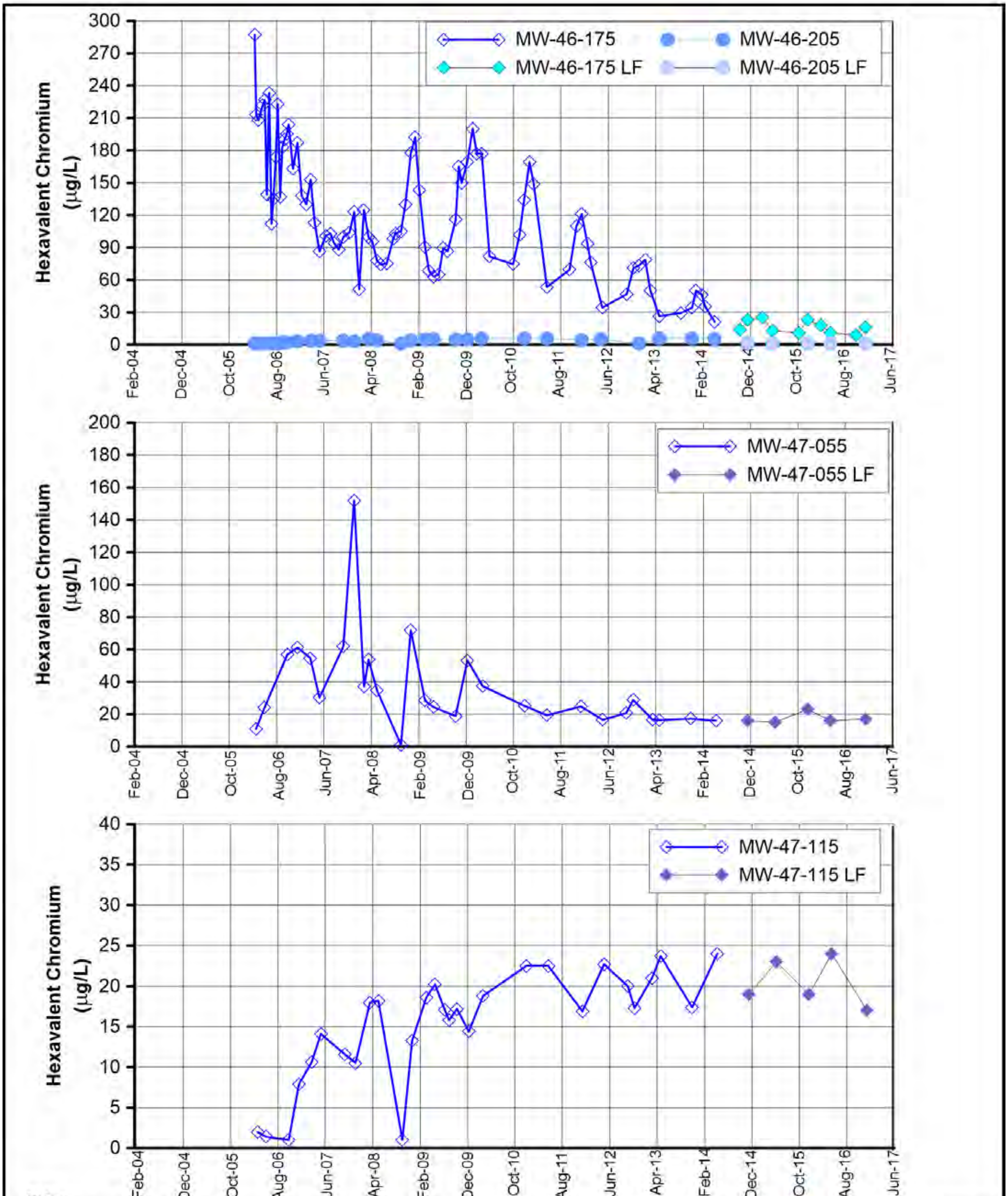
1) The IM Contingency Plan and hexavalent chromium [Cr(VI)] trigger levels were updated July 17, 2008 (DTSC, 2008b).
2) The trigger level for MW-44-070 is 20 µg/L.
3) The trigger level for MW-44-115 is 1,200 µg/L.
4) The trigger level for MW-44-125 is 475 µg/L.

LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

FIGURE C-10
HEXAVALENT CHROMIUM IN MW-44 CLUSTER

ARCADIS

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA



Notes:

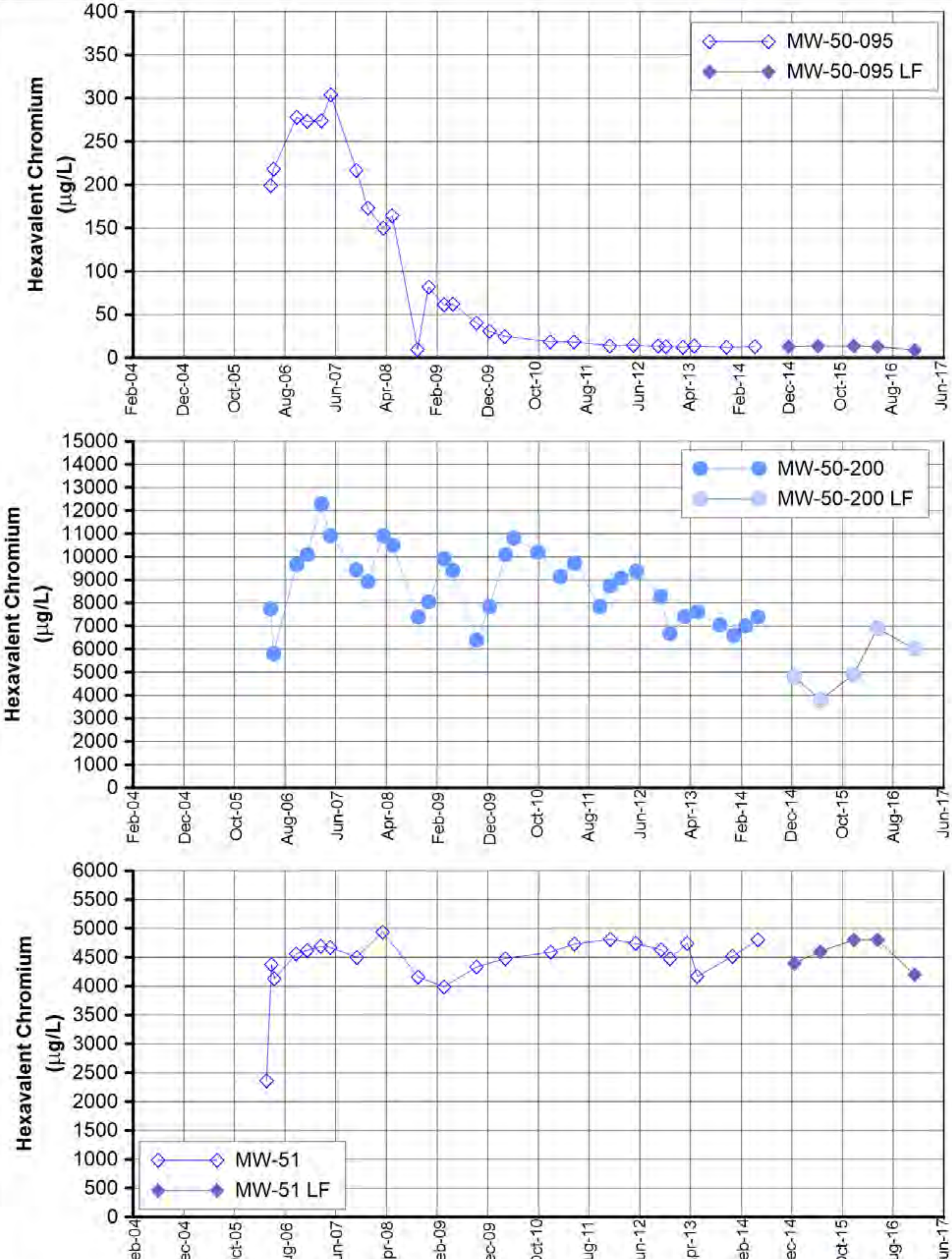
1) The IM Contingency Plan and hexavalent chromium [Cr(VI)] trigger levels were updated July 17, 2008 (DTSC, 2008b).
2) The trigger level for MW-46-175 is 225 µg/L.
3) The trigger level for MW-46-205 is 20 µg/L.
4) The trigger level for MW-47-055 is 475 µg/L.
5) The trigger level for MW-47-115 is 31 µg/L.

LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

FIGURE C-11
HEXAVALENT CHROMIUM IN MW-46 AND MW-47 CLUSTERS

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS



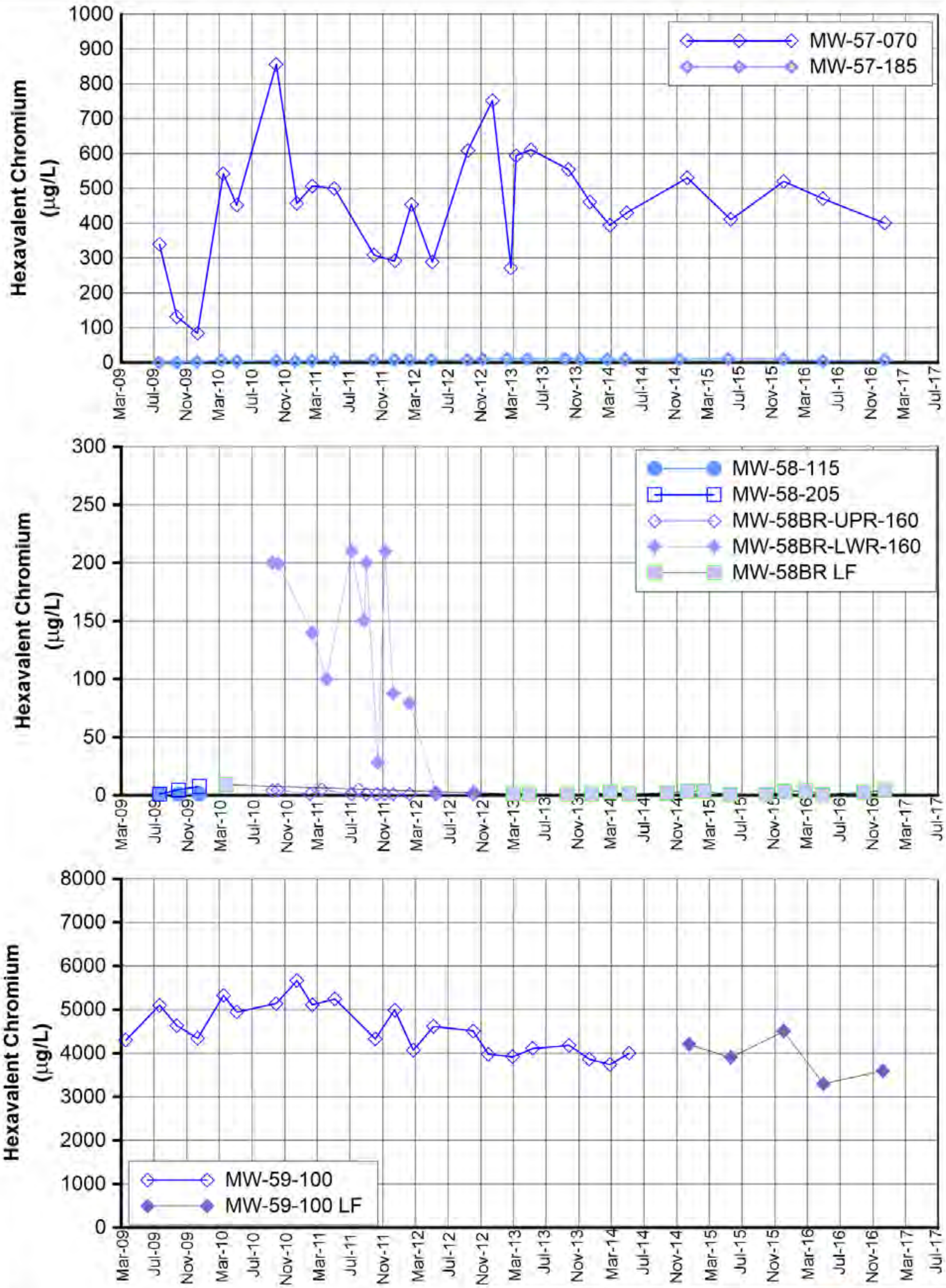
Notes:

LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

FIGURE C-12
HEXAVALENT CHROMIUM IN MW-50 AND MW-51 CLUSTERS

ARCADIS

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA



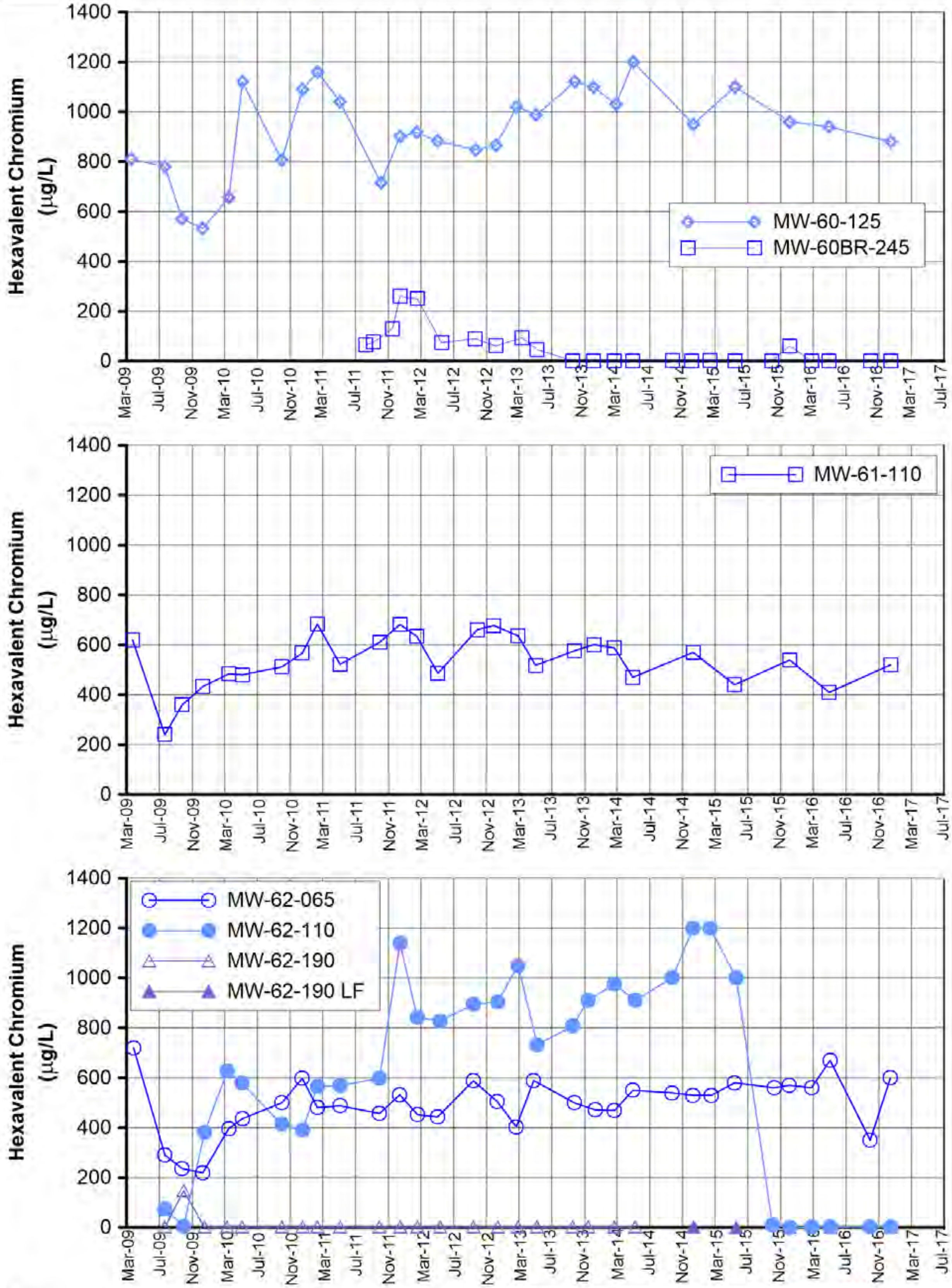
Note:

LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

FIGURE C-13
HEXAVALENT CHROMIUM IN MW-57 CLUSTER, MW-58 CLUSTER AND MW-59-100

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS



Notes:

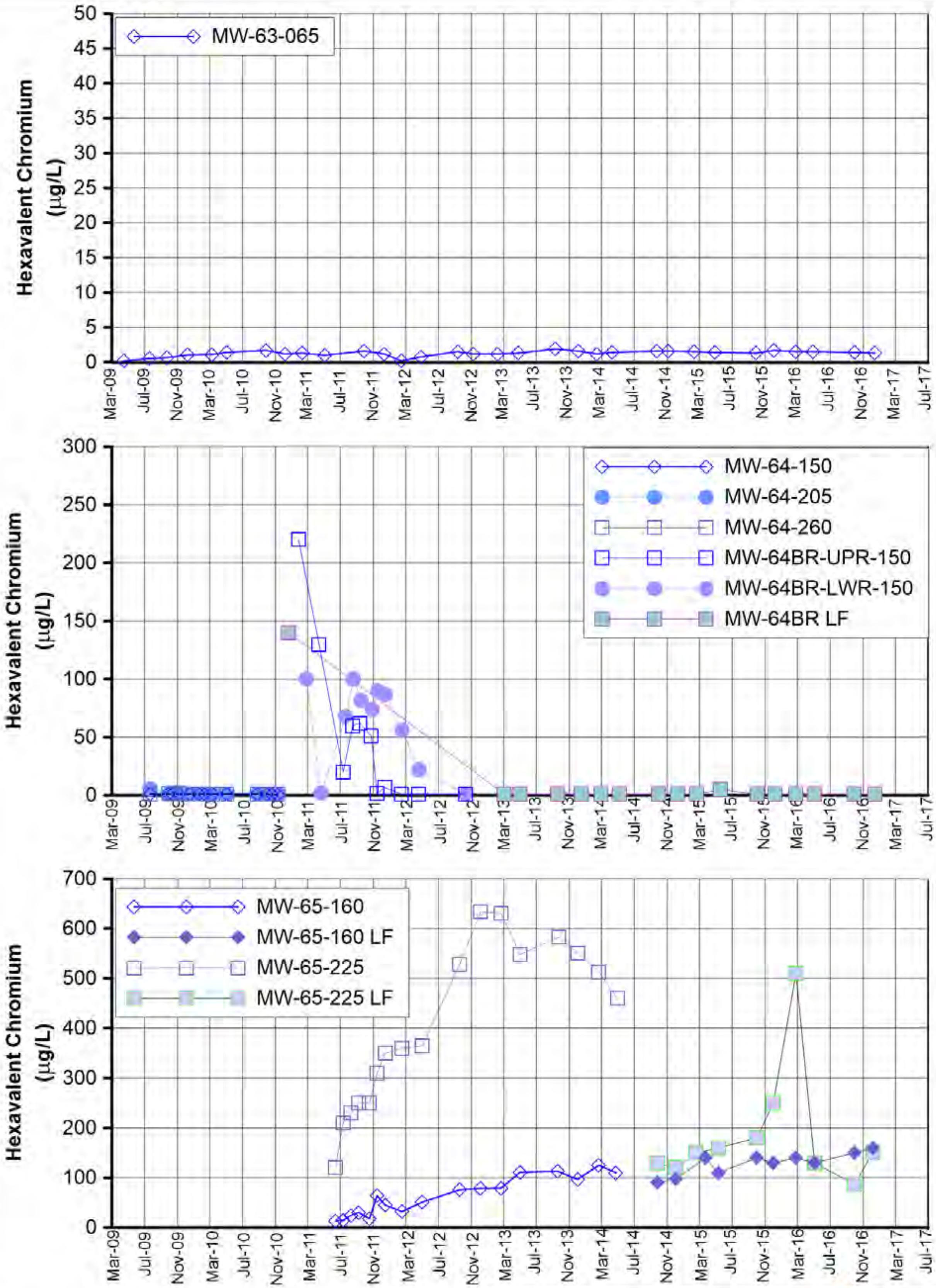
LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

1. MW-60-125 sampled using LF method on 12/14/2016.
2. MW-62-065 sampled using LF method on 9/28/2016 & 12/13/2016.

FIGURE C-14
HEXAVALENT CHROMIUM
IN MW-60 CLUSTER, MW-61-110 AND MW-62 CLUSTER

ARCADIS

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA



Notes:

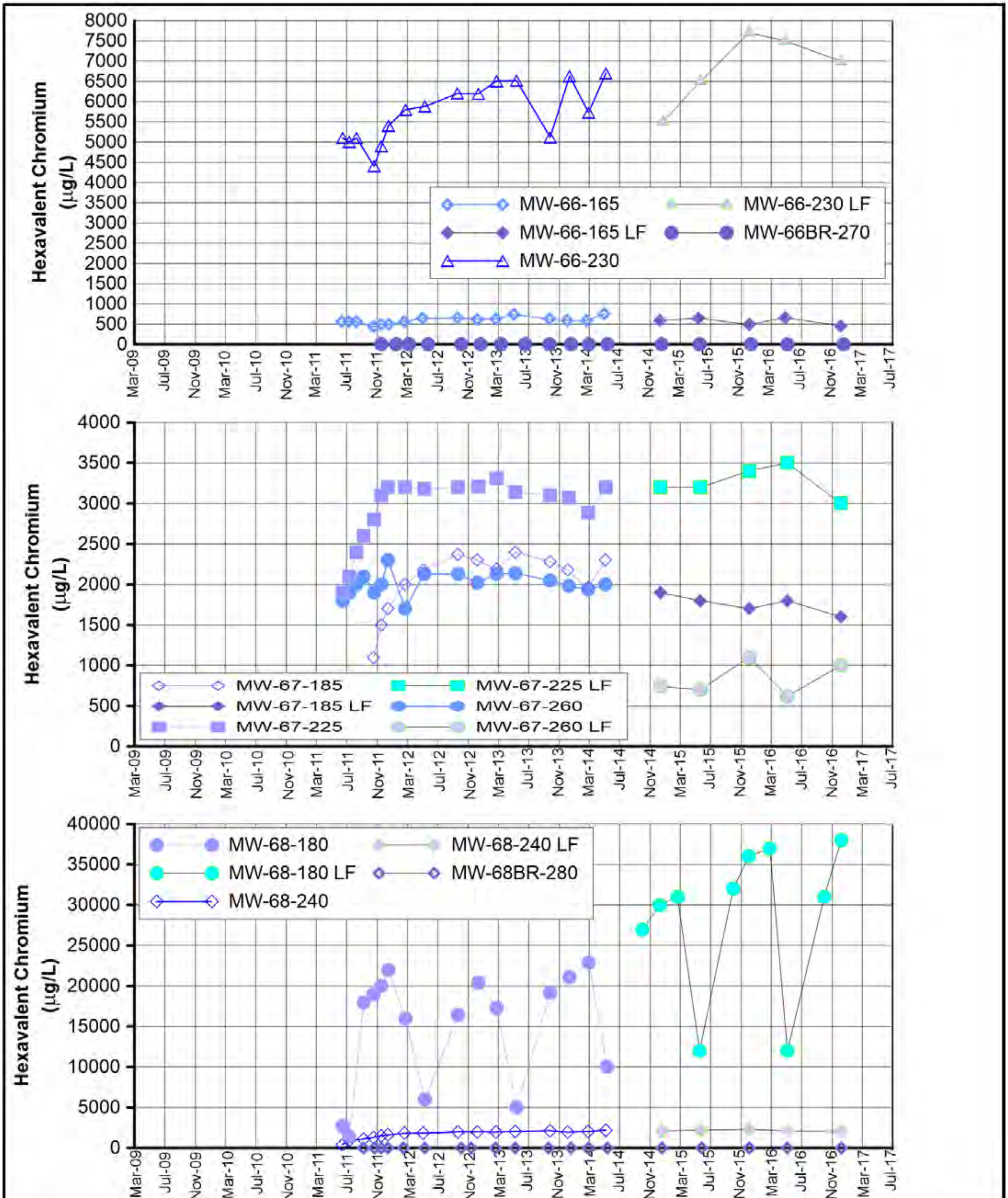
LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

1. MW-63-065 sampled using LF method on 4/28/2016 & 9/30/2016.

FIGURE C-15
HEXAVALENT CHROMIUM IN MW-63-065, MW-64 CLUSTER AND MW-65 CLUSTER

ARCADIS

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA



Notes:

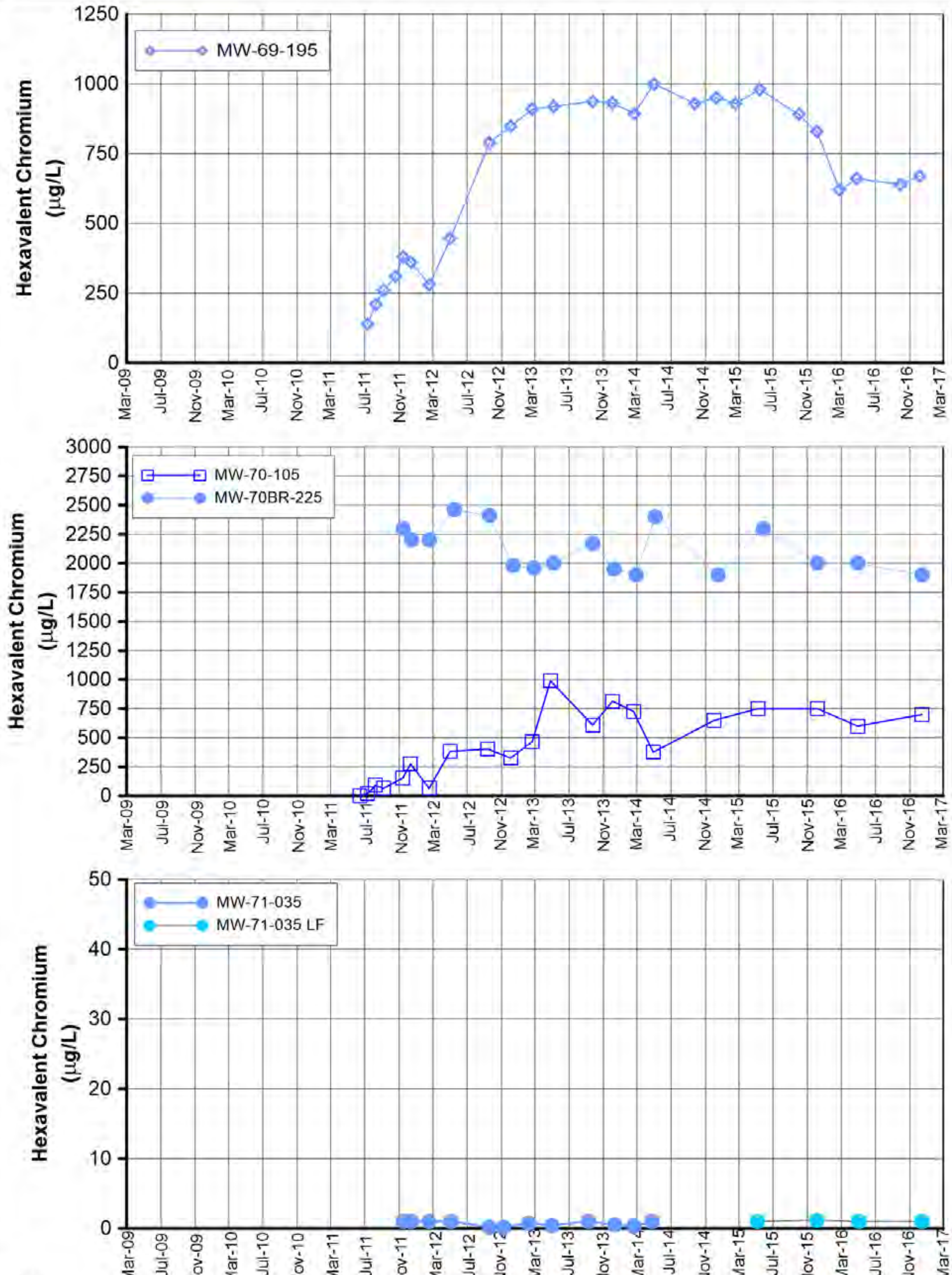
LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

1. MW-68BR-280 sampled using LF method on 5/4/2016.

FIGURE C-16
HEXAVALENT CHROMIUM IN MW-66, MW-67, AND MW-68 CLUSTERS

ARCADIS

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA



Notes:

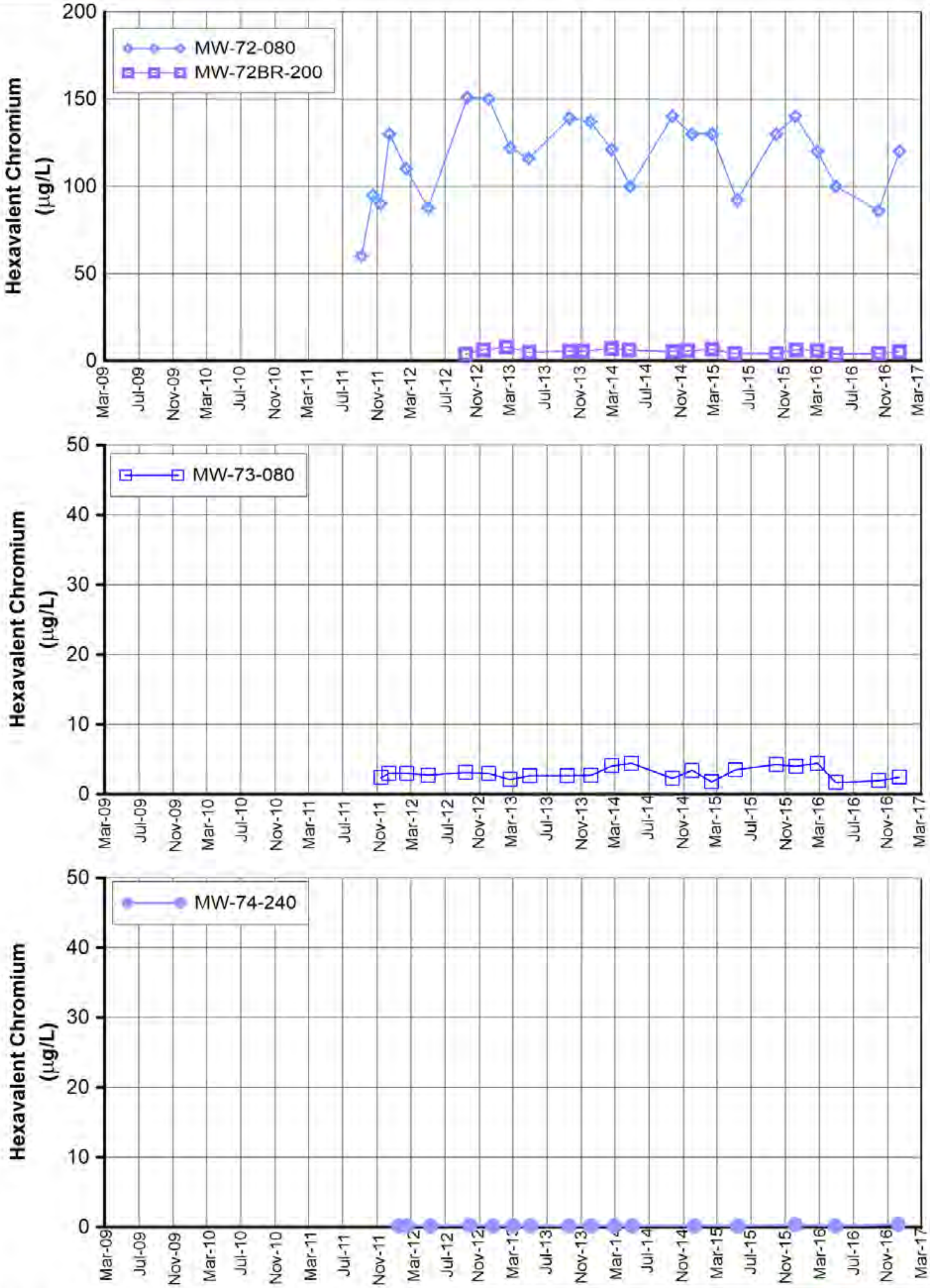
LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

1. MW-69-195 sampled using LF method on 9/29/2016 & 12/6/2016.
2. MW-70-105 sampled using LF method on 4/28/2016 & 12/14/2016.
3. MW-71-035 sampled using grab method on 12/14/2016.

FIGURE C-17
HEXAVALENT CHROMIUM IN MW-69-195, MW-70 CLUSTER, AND MW-71-035

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS



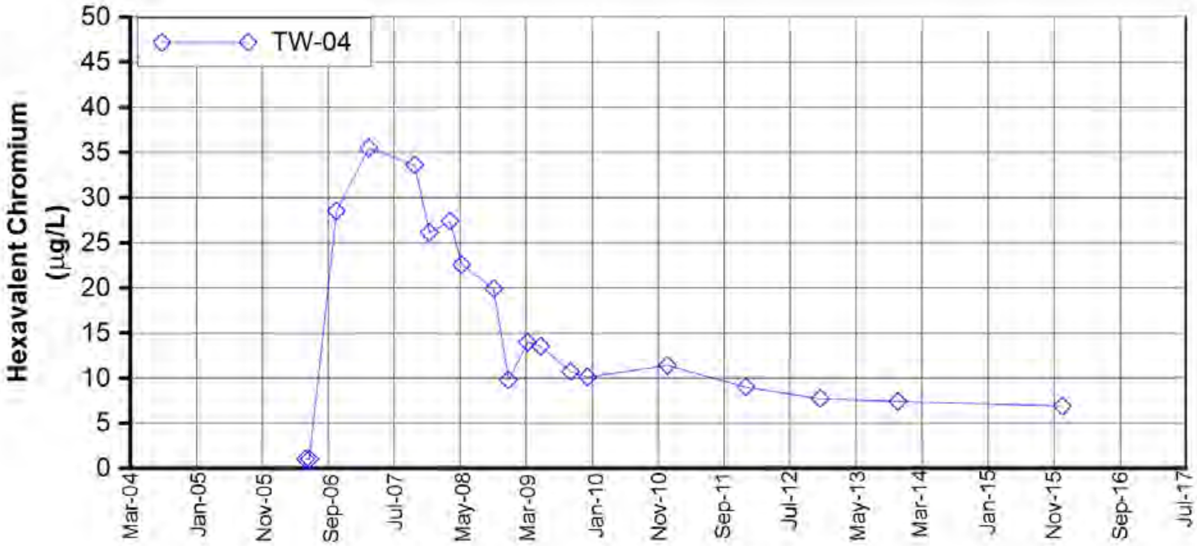
Notes:

1. MW-72-080 sampled using low flow sampling method on 9/28/2016 and 12/15/2016.
2. MW-73-080 sampled using low flow sampling method on 12/12/2016.
3. MW-74-240 sampled using low flow sampling method on 4/27/2016 and 12/8/2016.

FIGURE C-18
HEXAVALENT CHROMIUM IN MW-72 CLUSTER, MW-73-080, AND MW-74-240

ARCADIS

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA



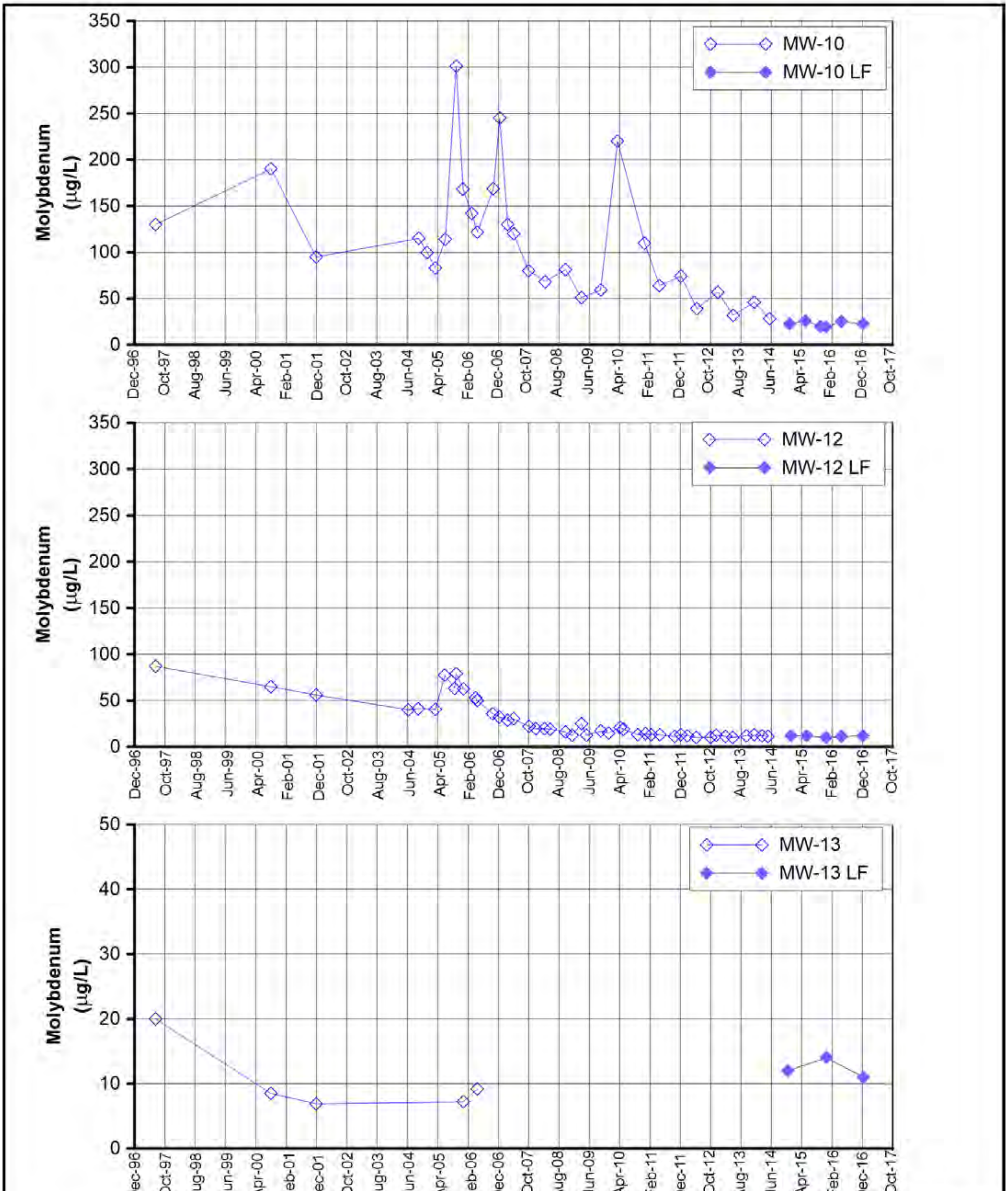
Notes:

1. TW-04 is sampled biannually and was not sampled in 2016.

FIGURE C-19
HEXAVALENT CHROMIUM
IN TW-04

ARCADIS

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA



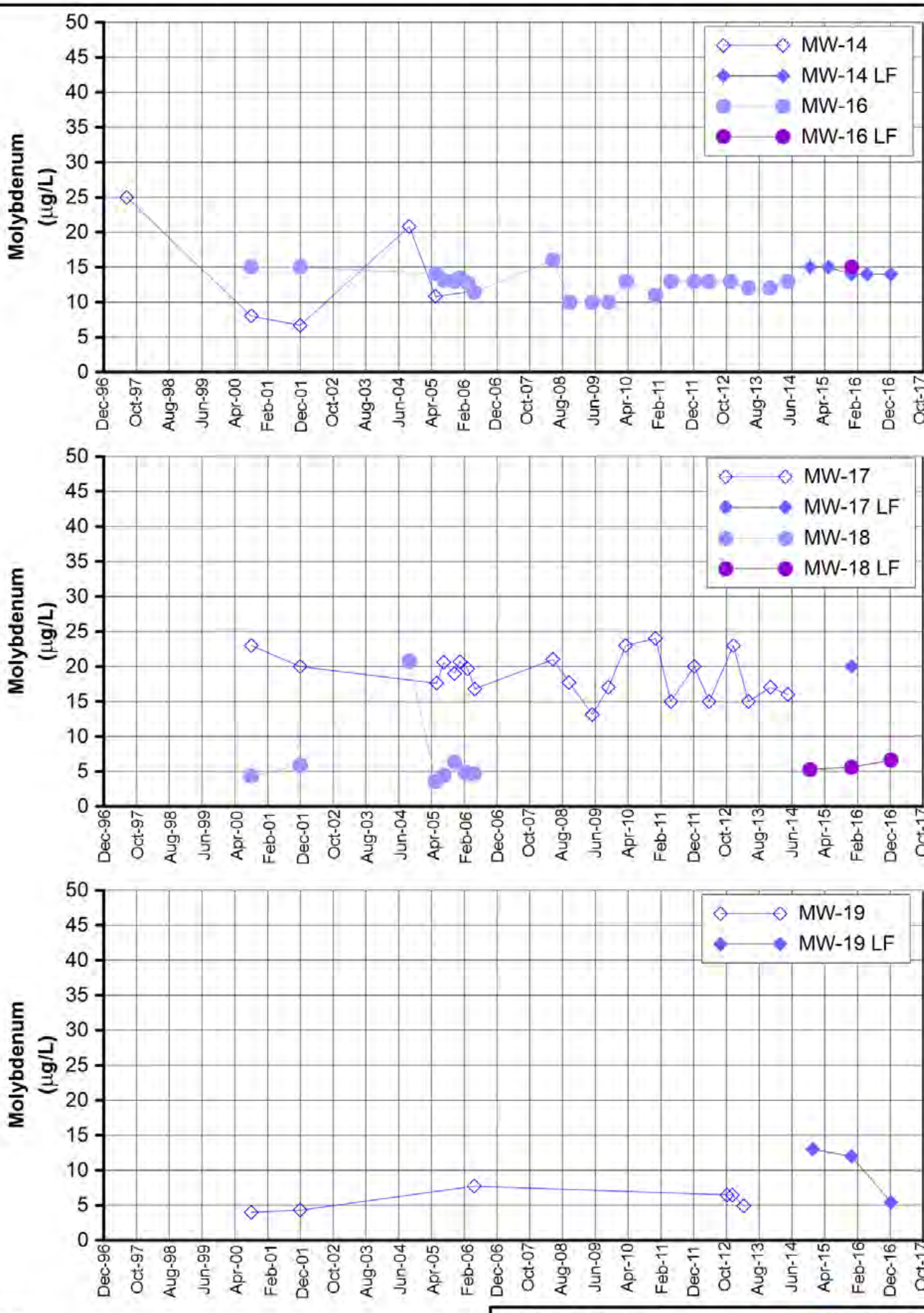
Notes:

LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

FIGURE C-20
MOLYBDENUM
IN MW-10, MW-12, AND MW-13

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS



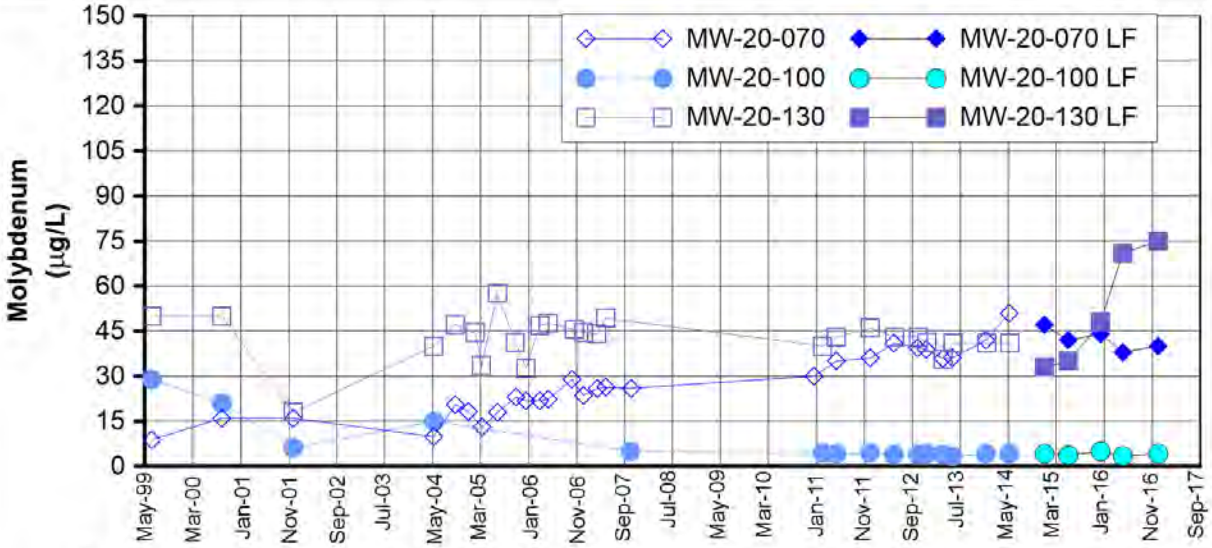
Notes:

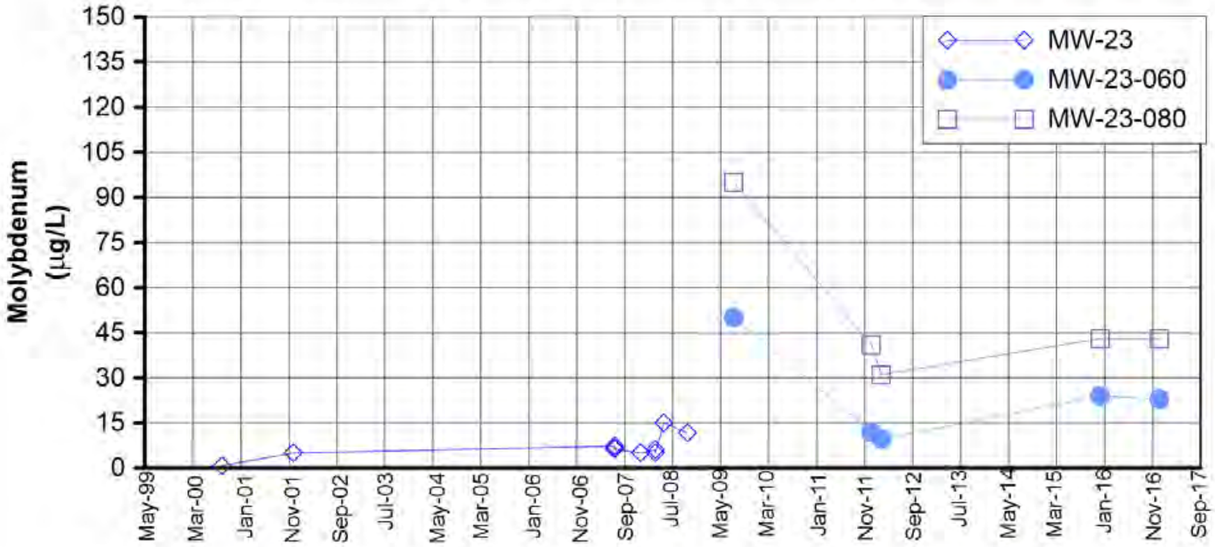
1. LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.
2. MW-16 and MW-17 are sampled biannually and were not sampled in 2016.

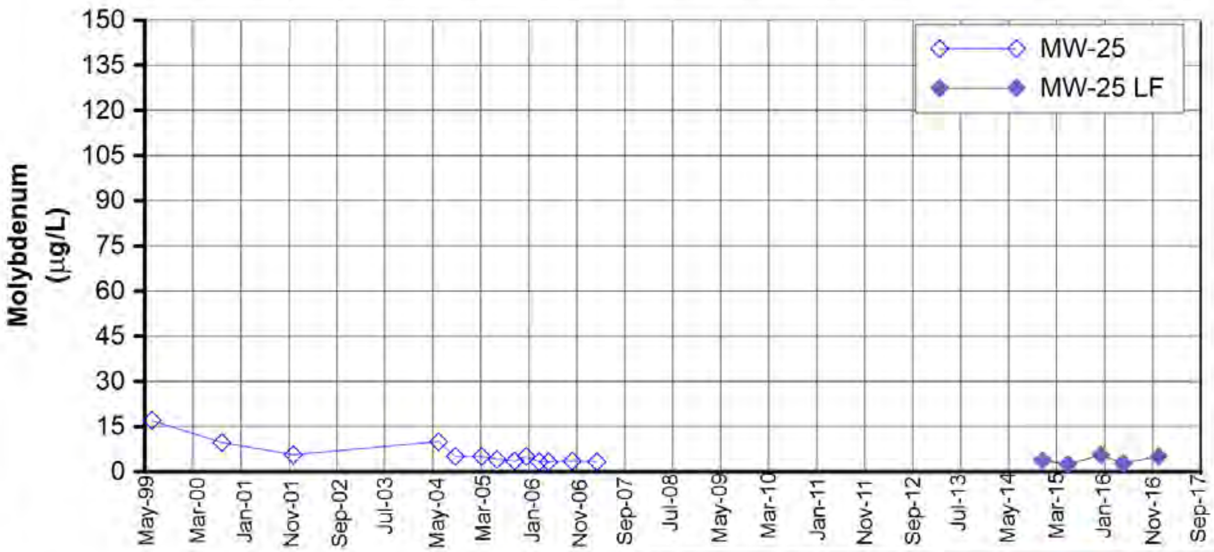
FIGURE C-21
MOLYBDENUM
IN MW-14, MW-16, MW-17, MW-18, AND MW-19

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS







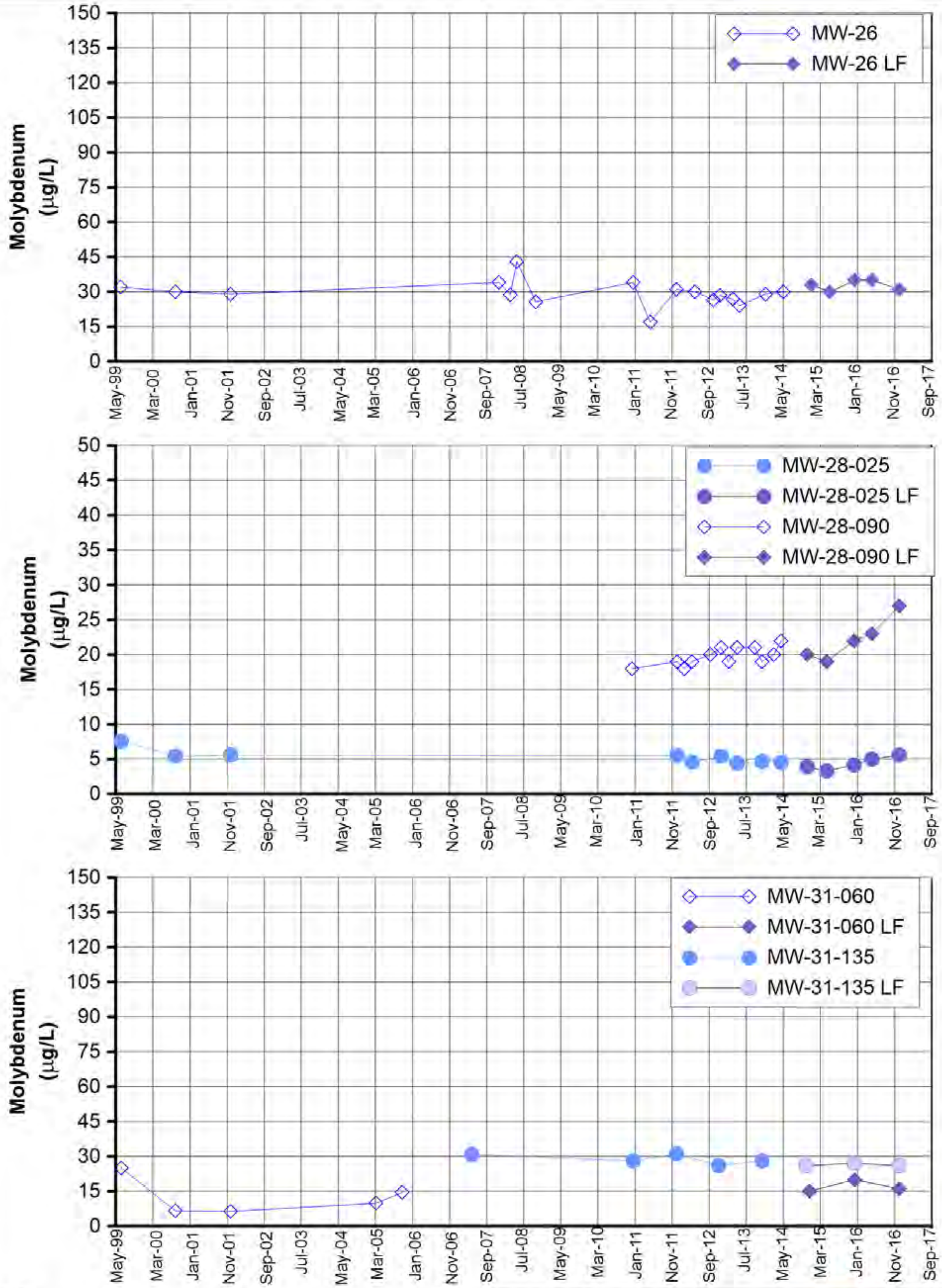
Notes:

LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

FIGURE C-22
MOLYBDENUM IN MW-20, MW-23, AND MW-25 CLUSTERS

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS

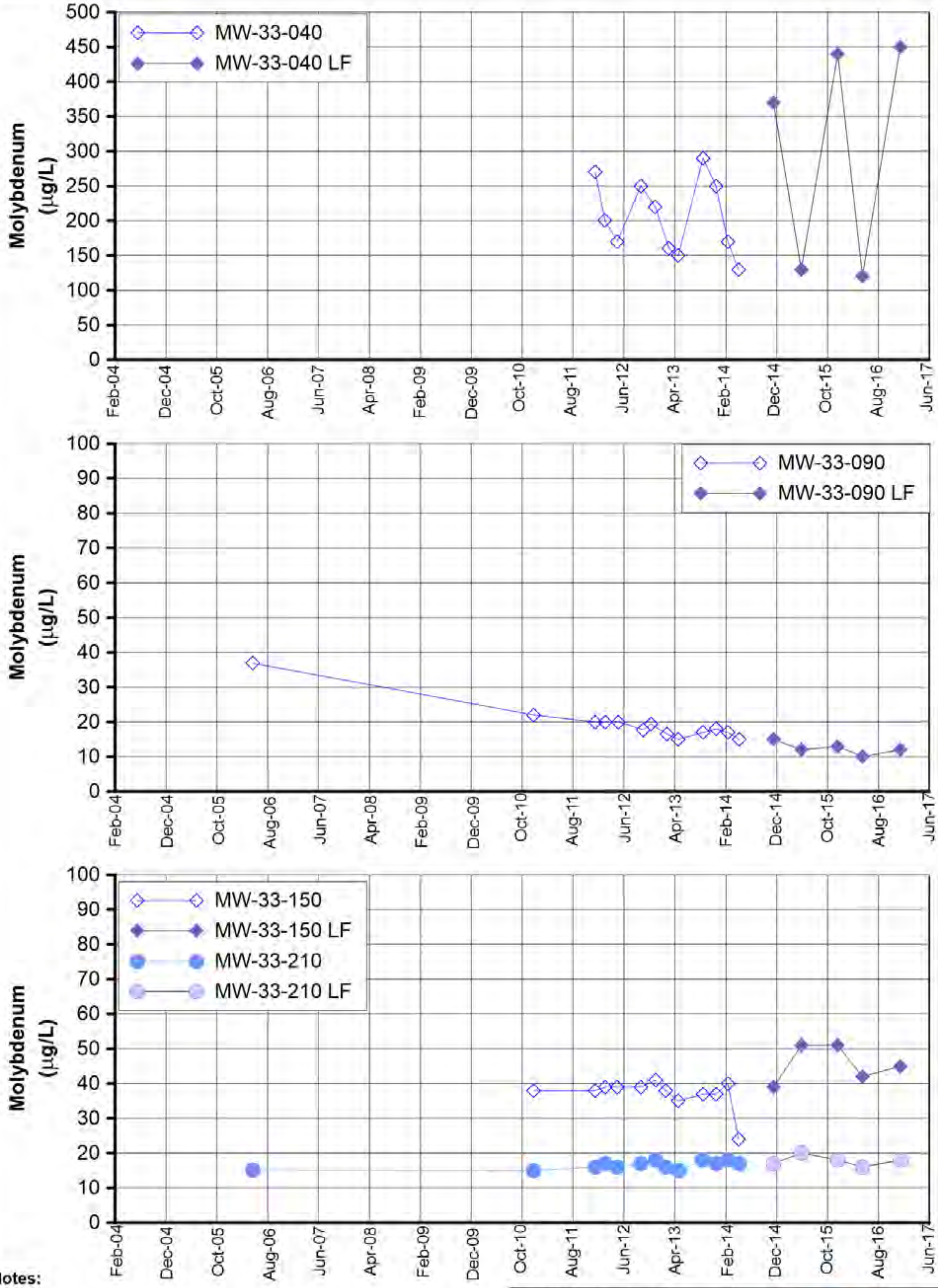


Notes:

LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

FIGURE C-23
MOLYBDENUM
IN MW-26, MW-28, AND MW-31 CLUSTERS
FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS



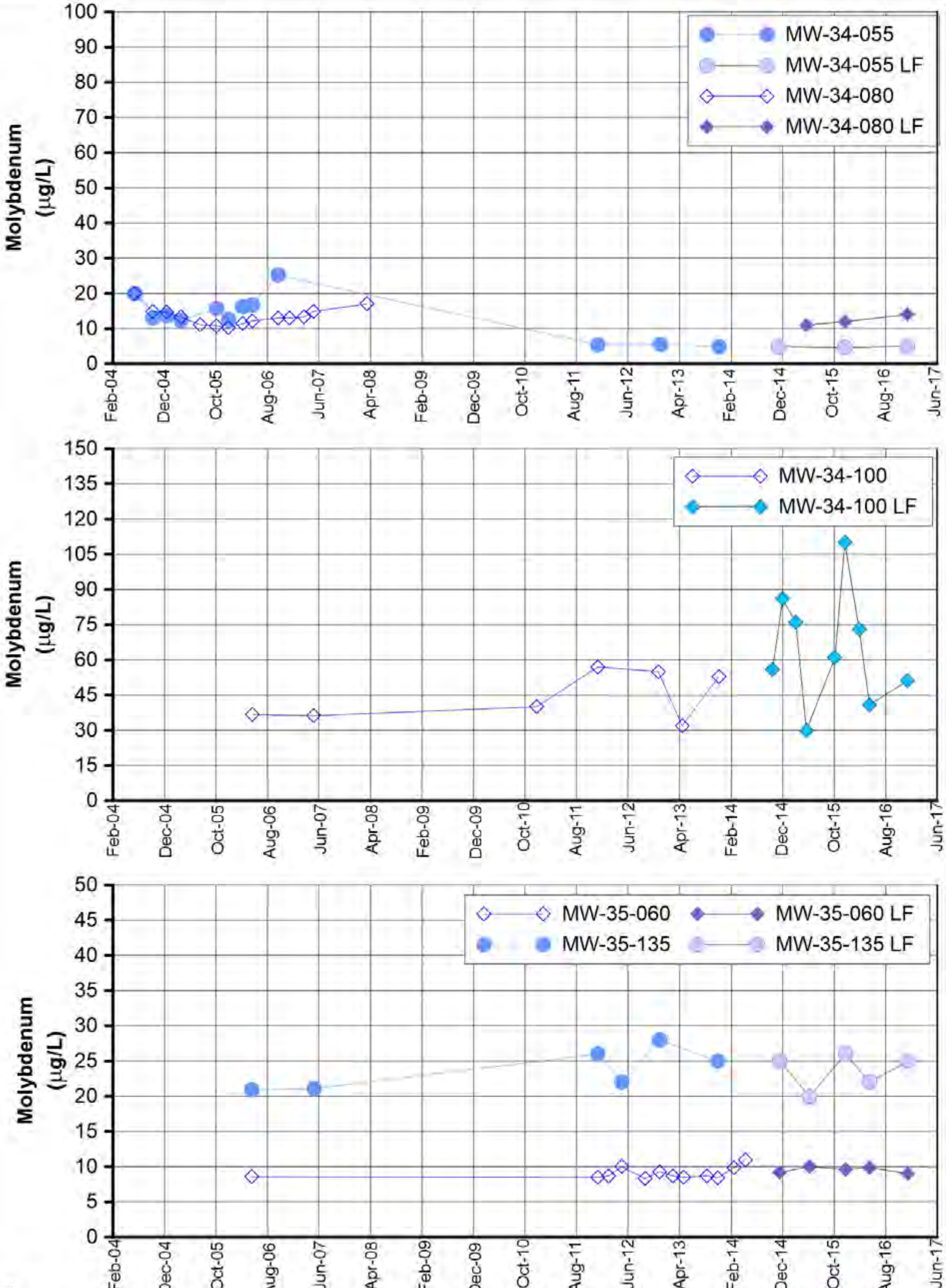
Notes:

LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

FIGURE C-24
MOLYBDENUM IN MW-33 CLUSTER

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS



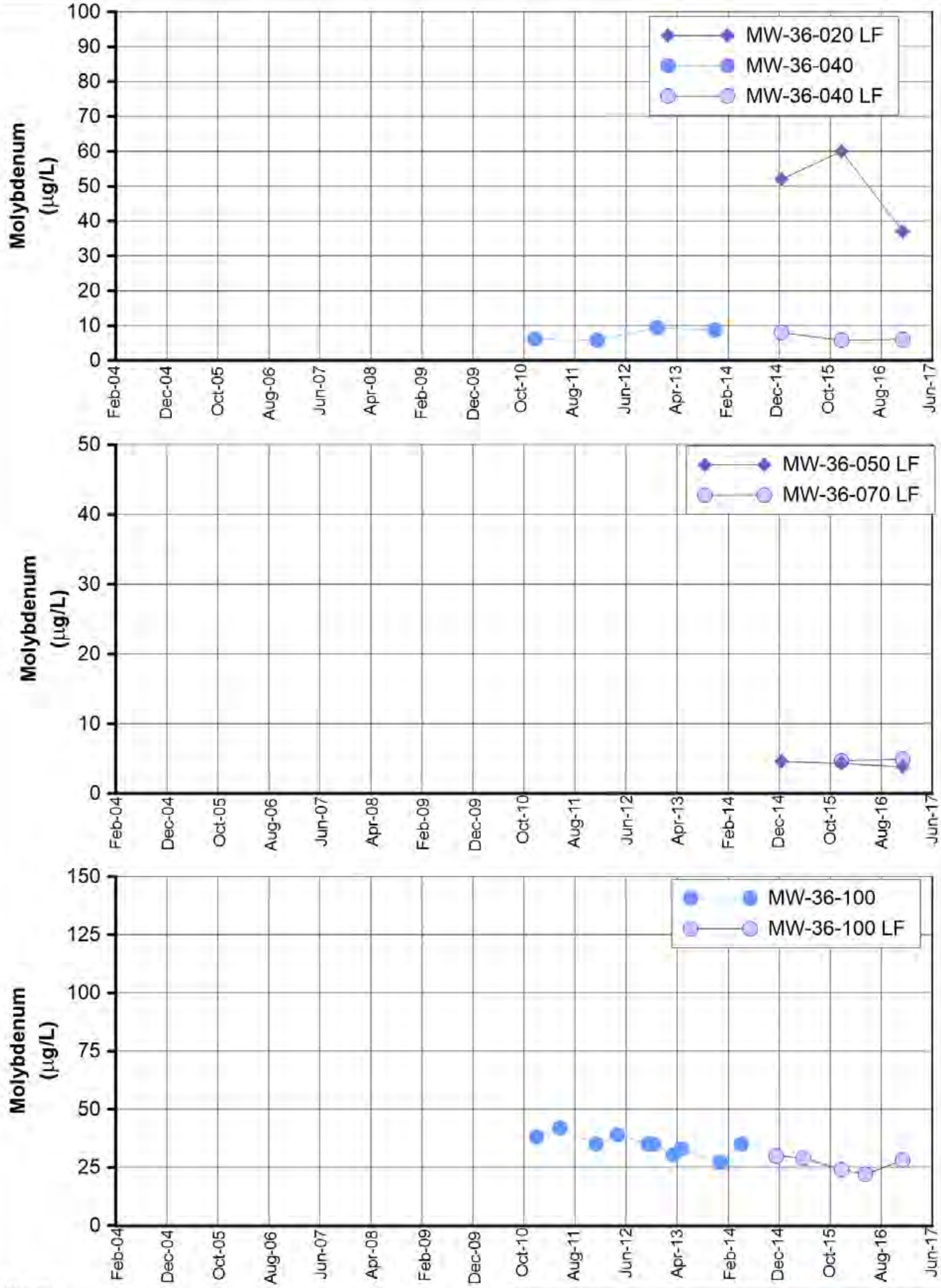
Notes:

LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

FIGURE C-25
MOLYBDENUM
IN MW-34 AND MW-35 CLUSTERS

ARCADIS

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA



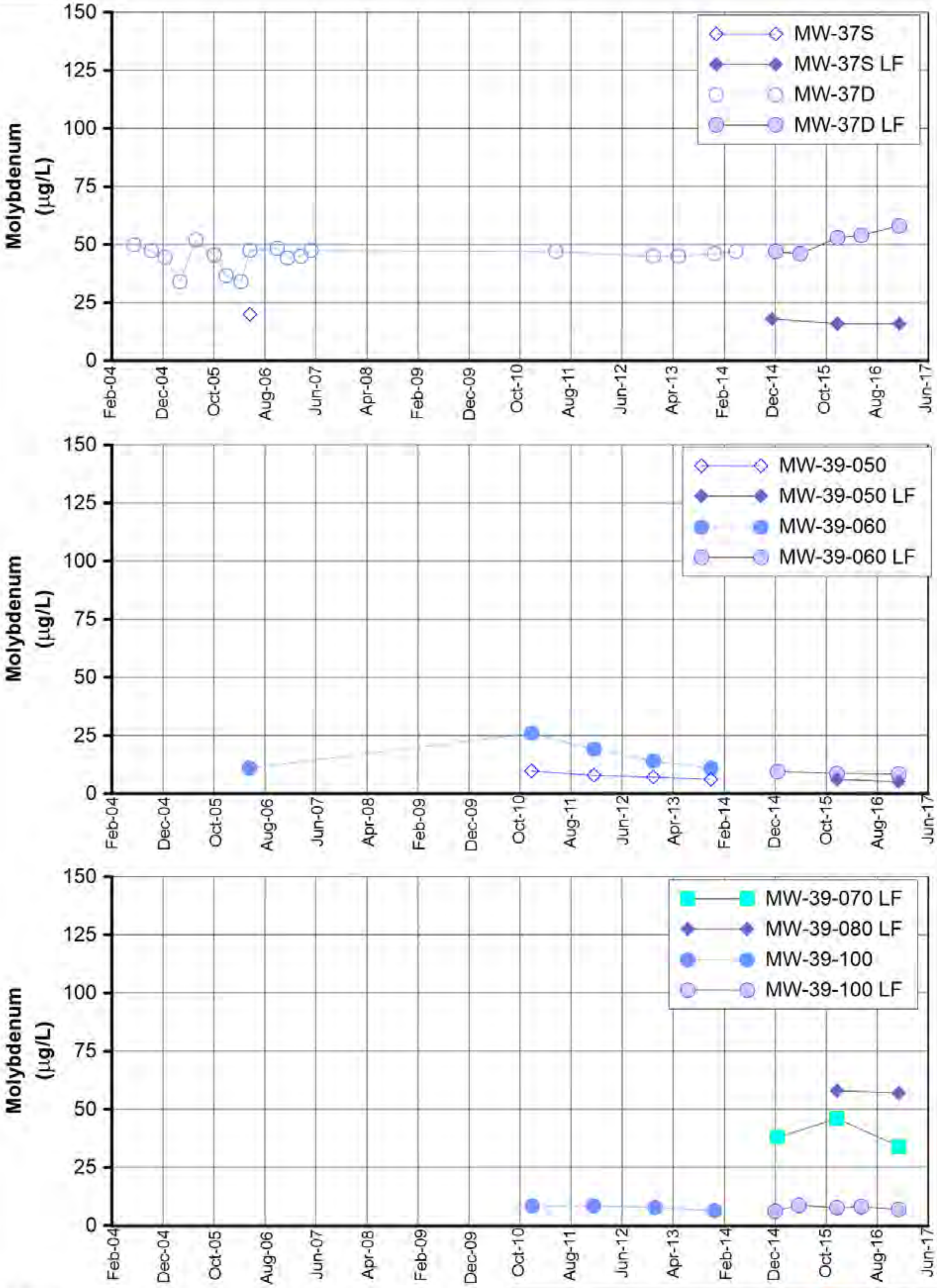
Notes:

LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

FIGURE C-26
MOLYBDENUM IN MW-36 CLUSTER

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS



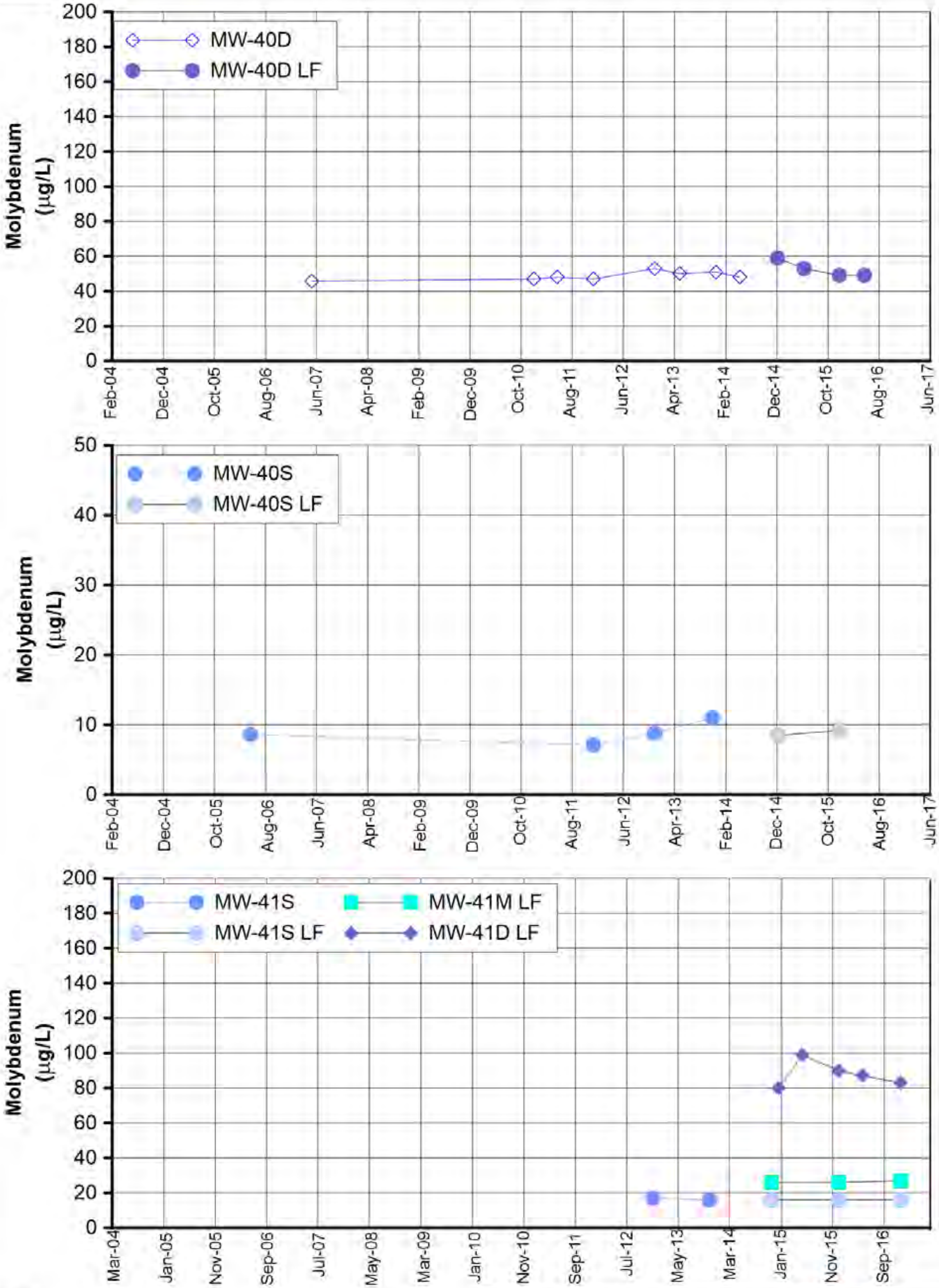
Notes:

LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

FIGURE C-27
MOLYBDENUM
IN MW-37 AND MW-39 CLUSTERS

ARCADIS

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA



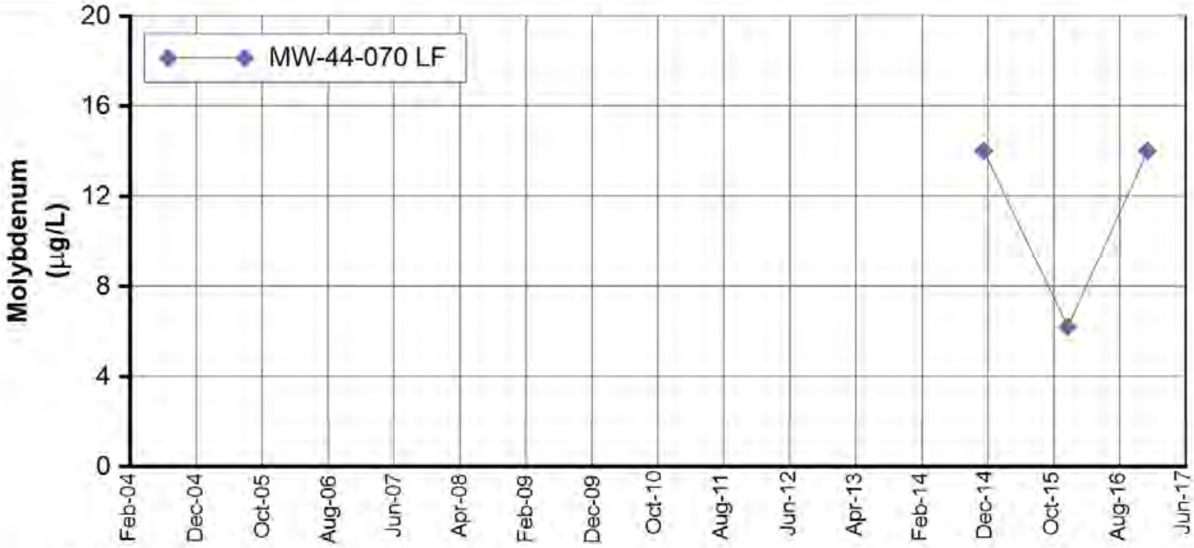
Notes:

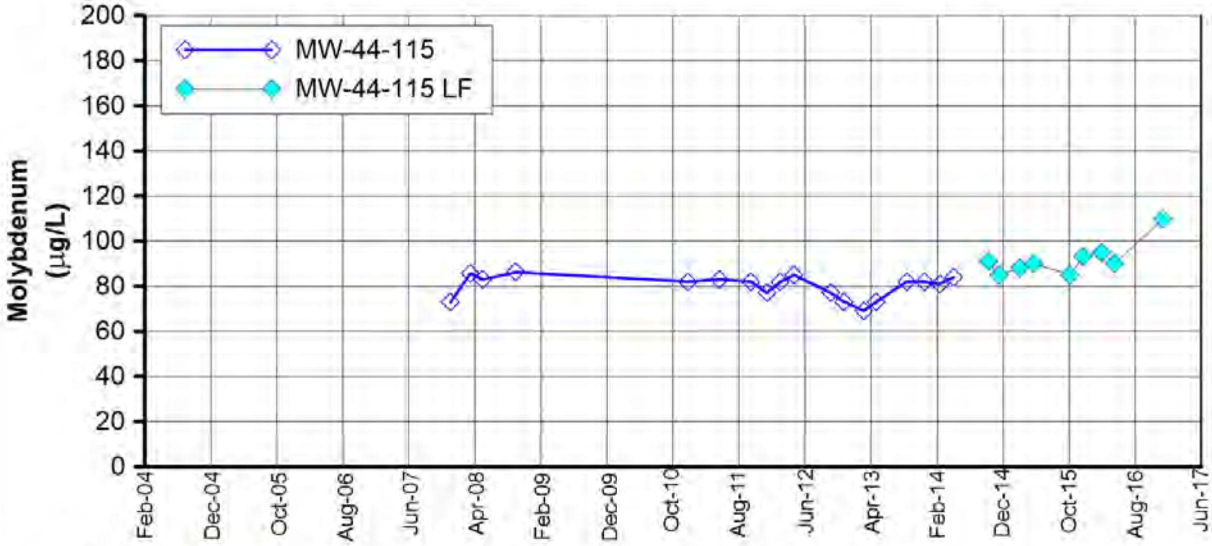
1. LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.
2. MW-40D and MW-40S were not sampled during 4th Quarter 2016 due to traffic control issues.

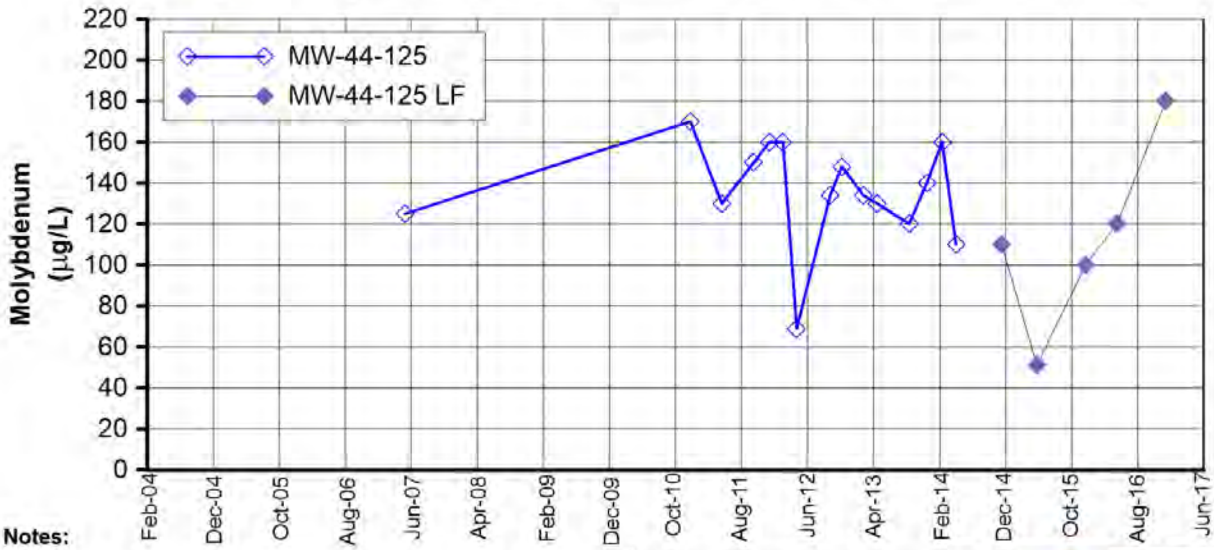
FIGURE C-28
MOLYBDENUM
IN MW-40 AND MW-41 CLUSTERS

ARCADIS

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA







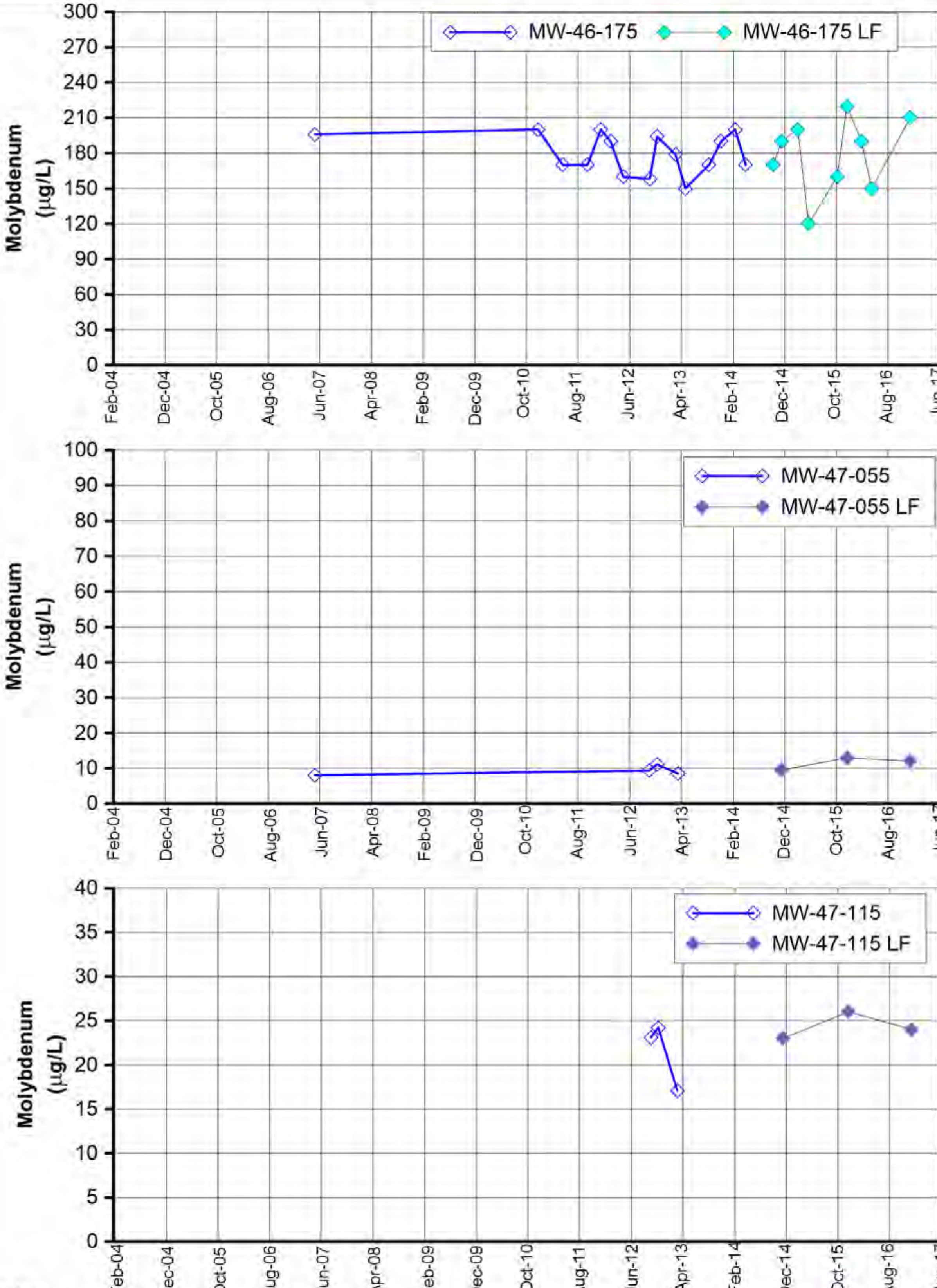
Notes:

LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

FIGURE C-29
MOLYBDENUM
IN MW-44 CLUSTER

ARCADIS

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

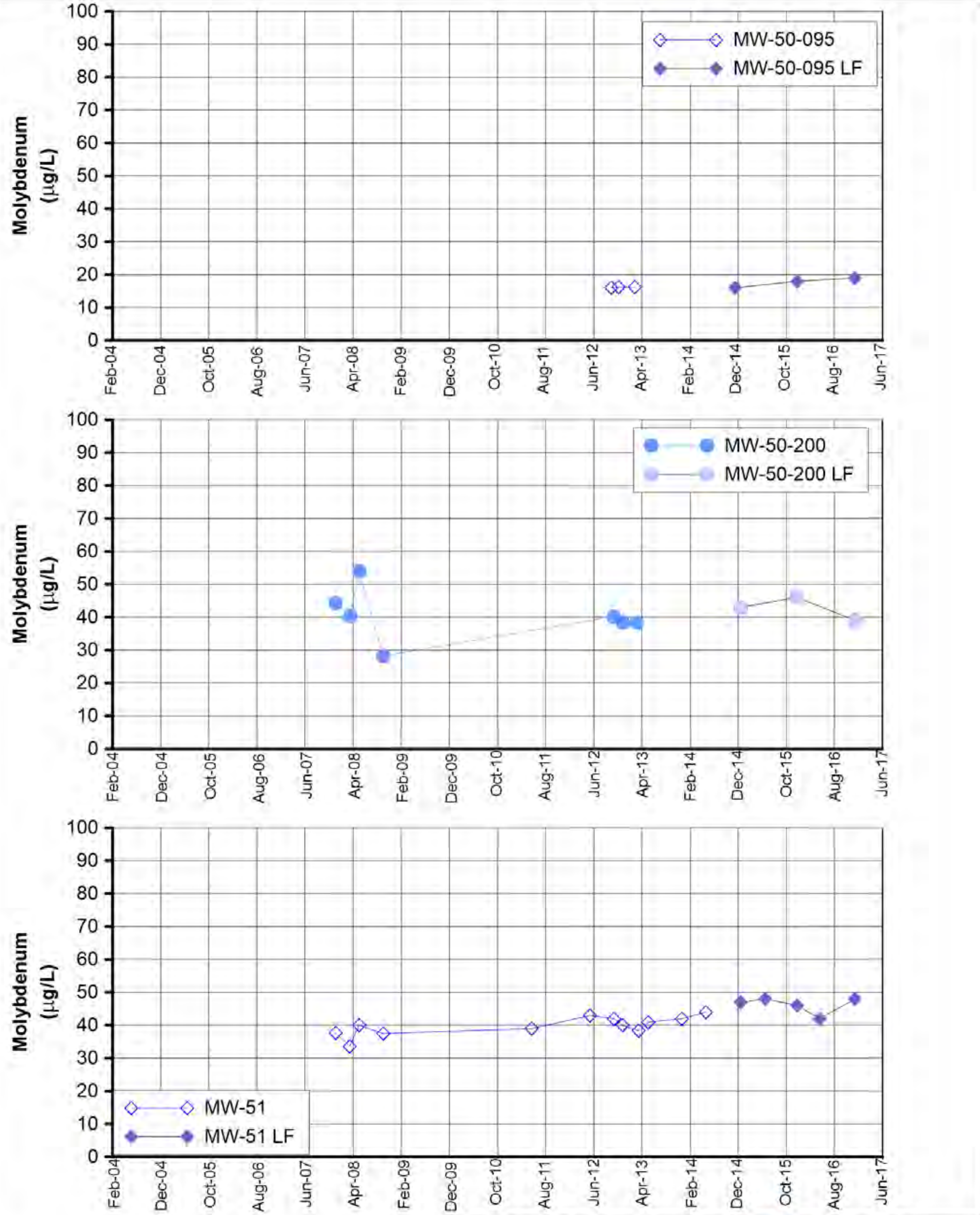


Notes:

LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

FIGURE C-30
MOLYBDENUM
IN MW-46 AND MW-47 CLUSTERS
FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS



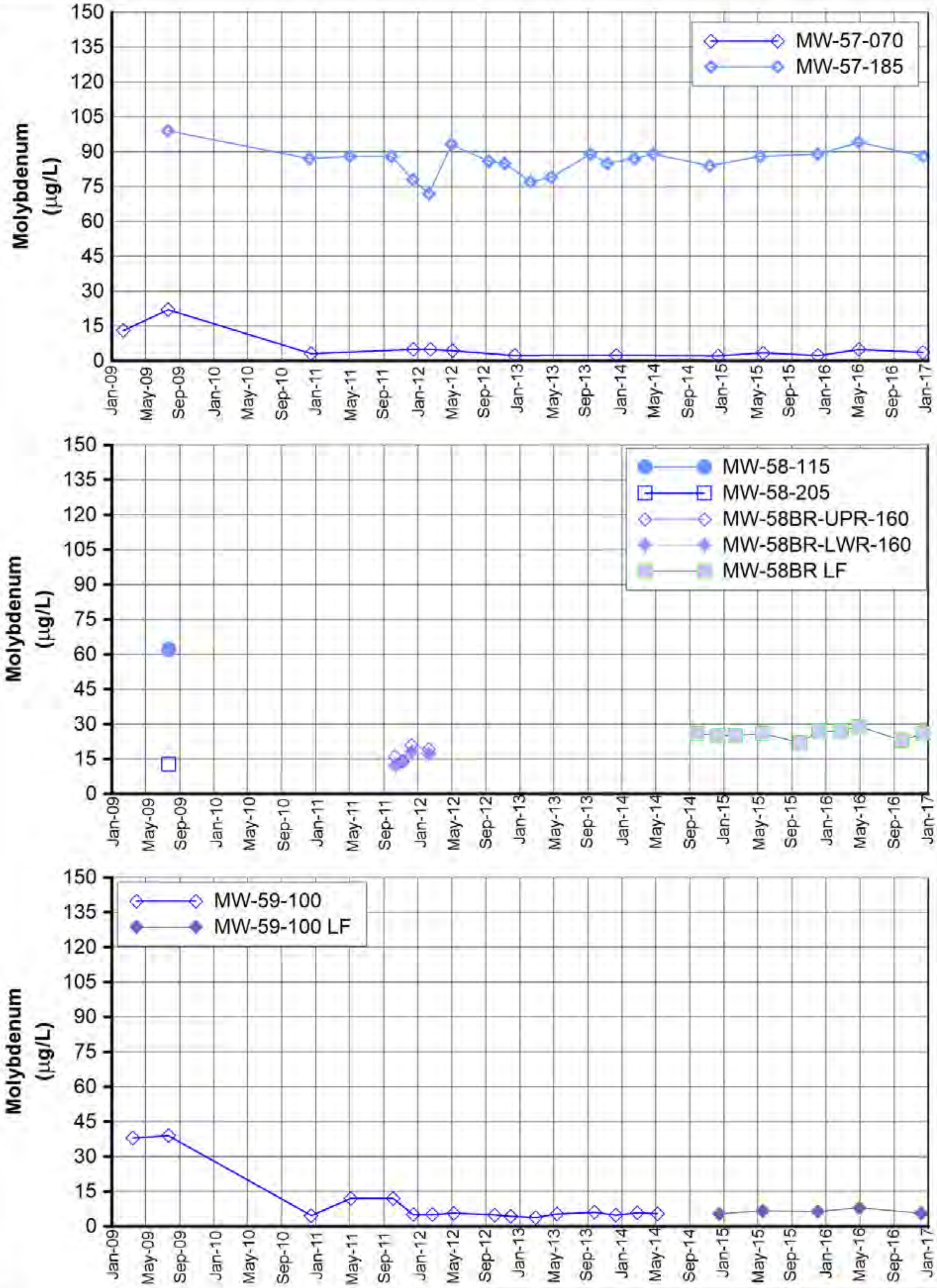
Notes:

LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

FIGURE C-31
MOLYBDENUM
IN MW-50 AND MW-51 CLUSTERS

ARCADIS

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

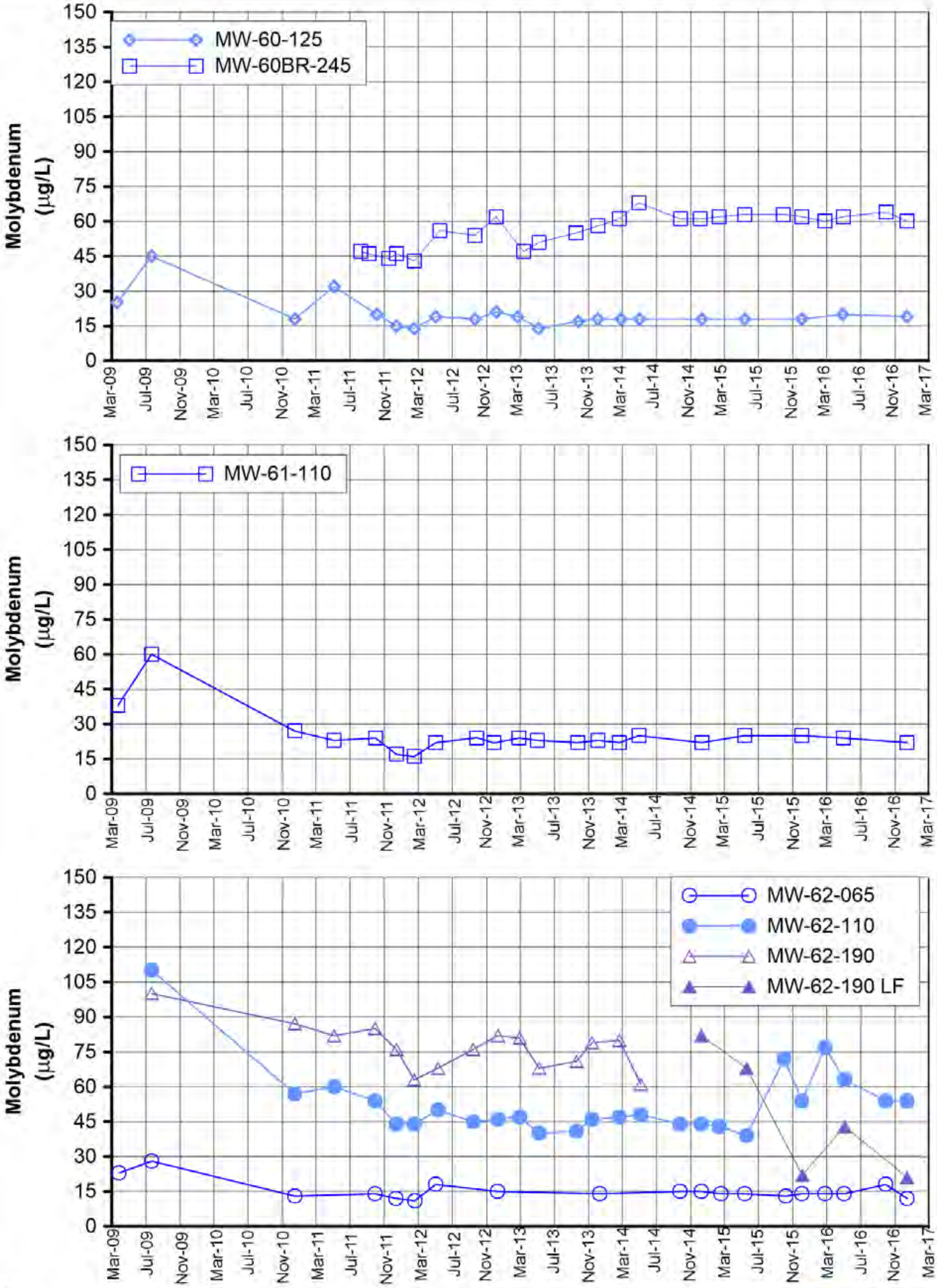


Note:

LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

FIGURE C-32
MOLYBDENUM
IN MW-57 CLUSTER, MW-58 CLUSTER AND MW-59-100
FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS



Notes:

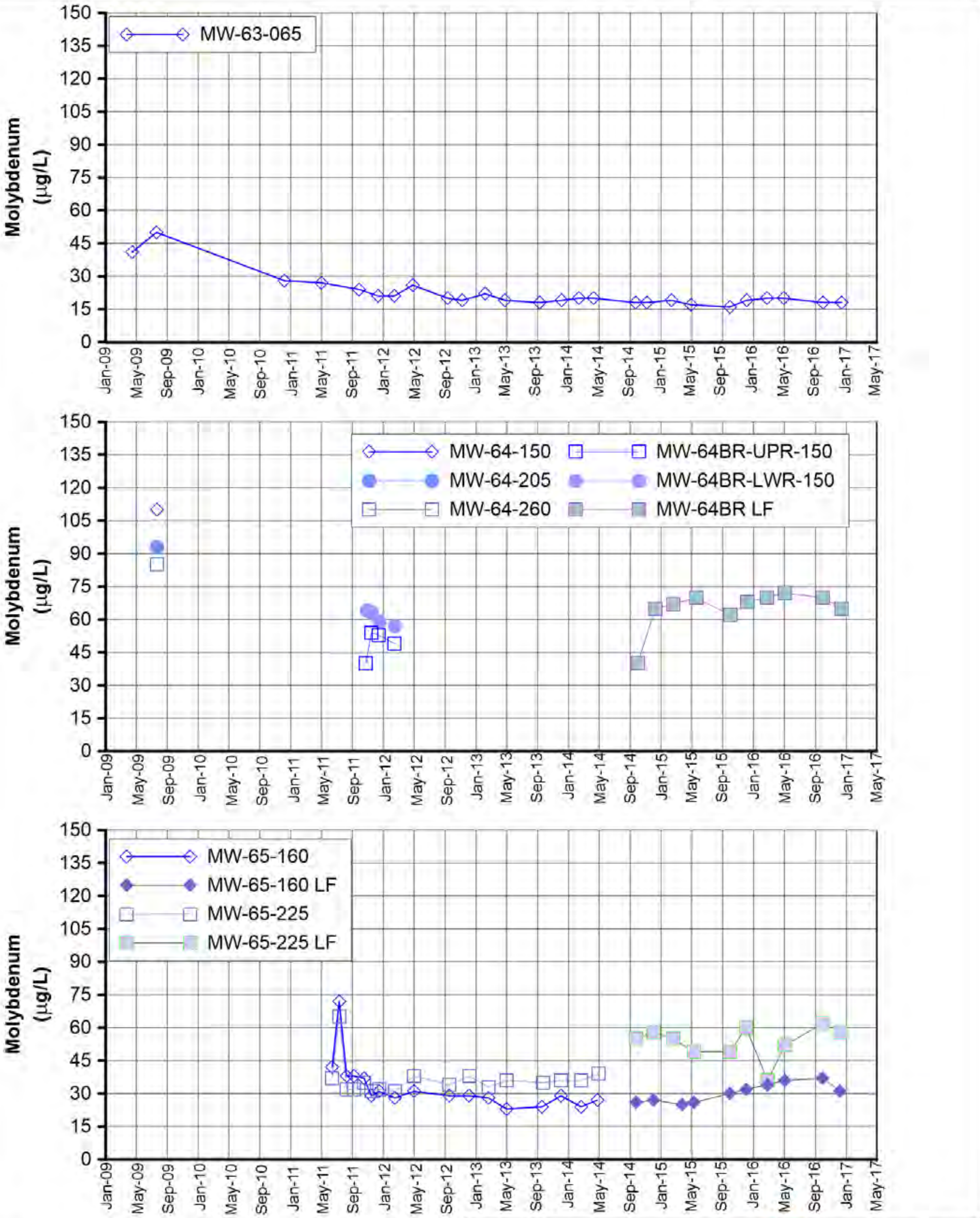
LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

1. MW-60-125 sampled using LF method on 12/14/2016.
2. MW-62-065 sampled using LF method on 9/28/2016 & 12/13/2016.

FIGURE C-33
MOLYBDENUM
IN MW-60 CLUSTER, MW-61-110, AND MW-62 CLUSTER

ARCADIS

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA



Notes:

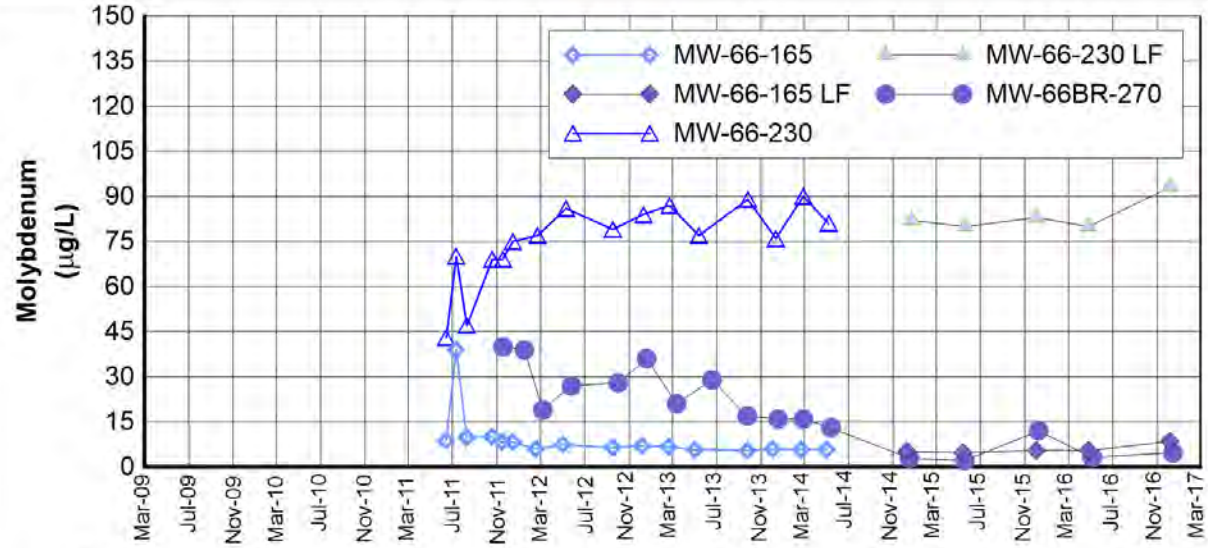
LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

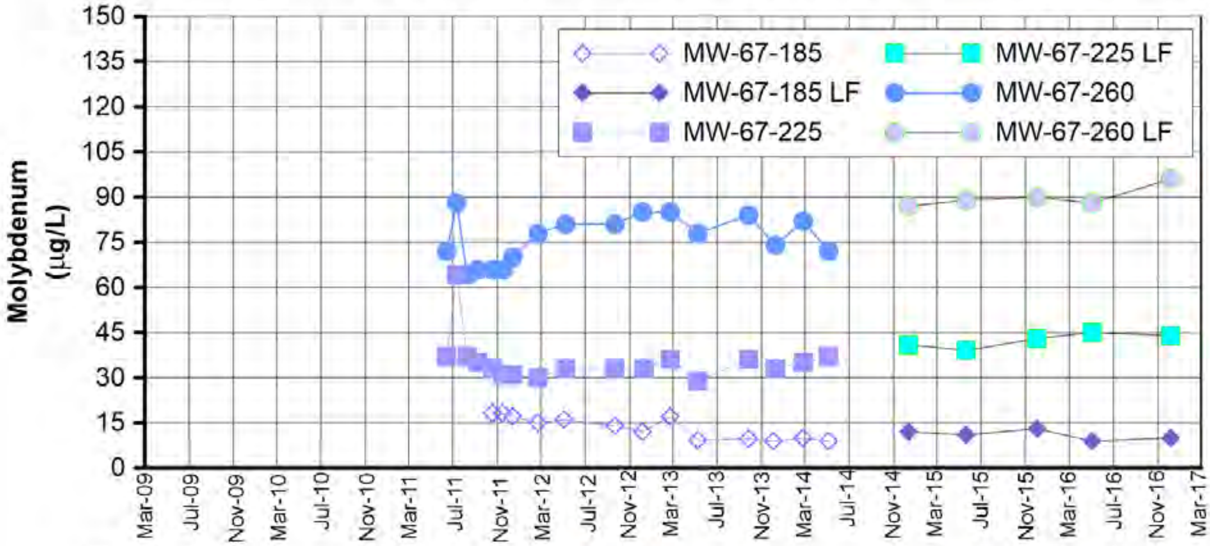
1. MW-63-065 sampled using LF method on 4/28/2016 & 9/30/2016.

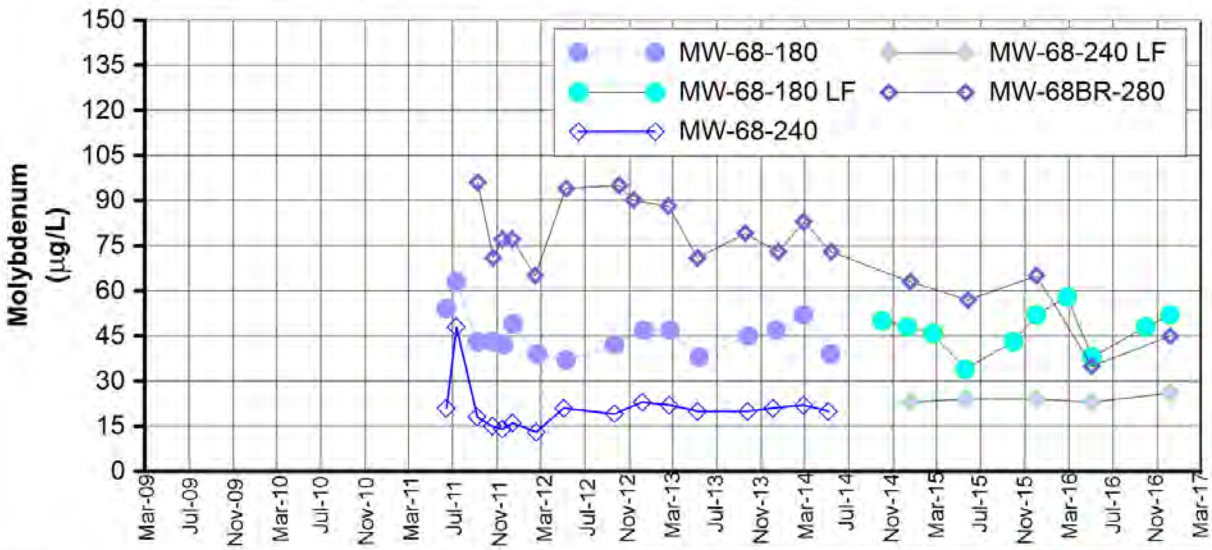
FIGURE C-34
MOLYBDENUM
IN MW-63-065, MW-64 CLUSTER AND MW-65 CLUSTER

ARCADIS

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA







Notes:

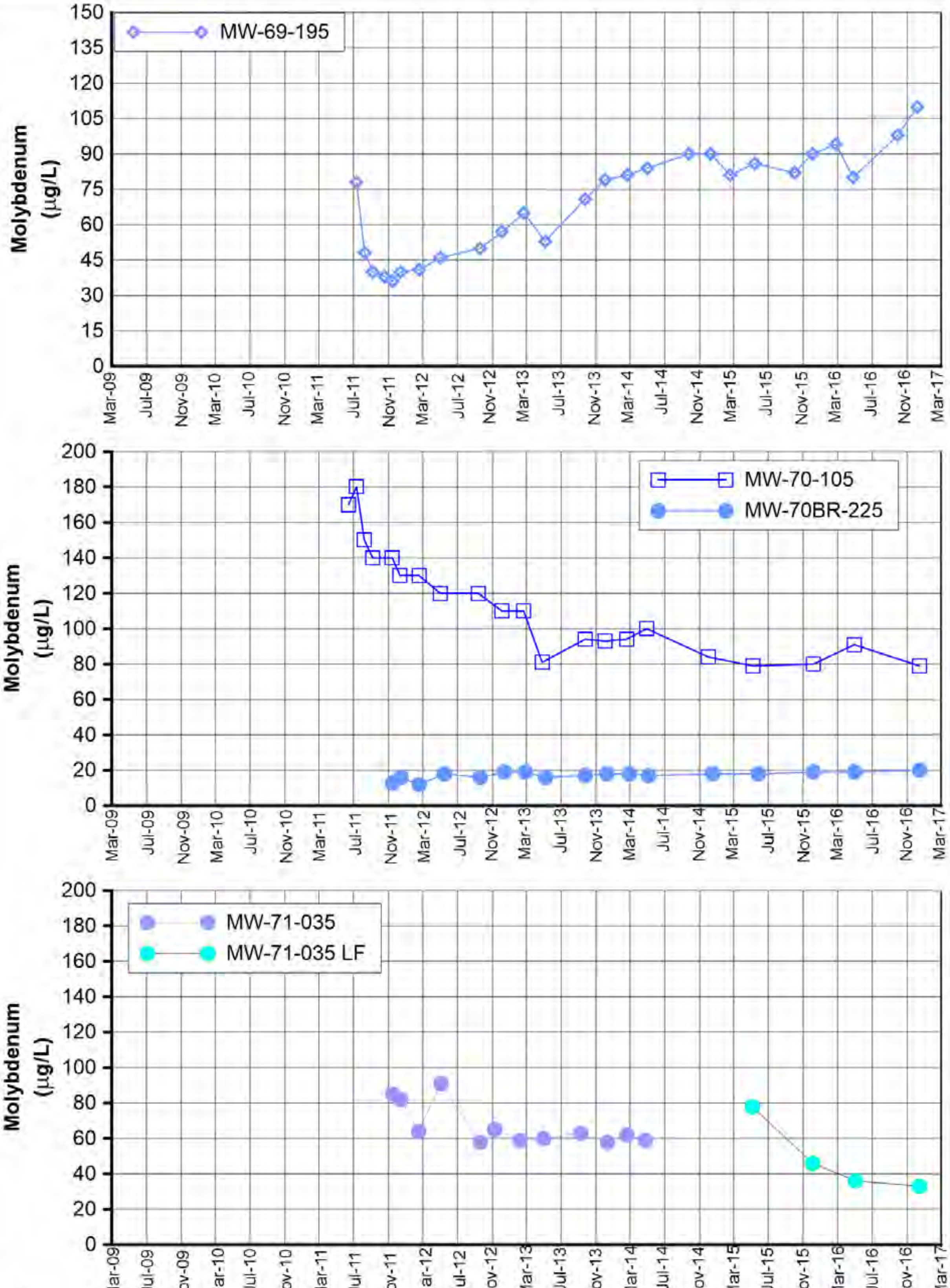
LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

1. MW-68BR-280 sampled using LF method on 5/4/2016.

FIGURE C-35
MOLYBDENUM
IN MW-66, MW-67, AND MW-68 CLUSTERS

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS



Notes:

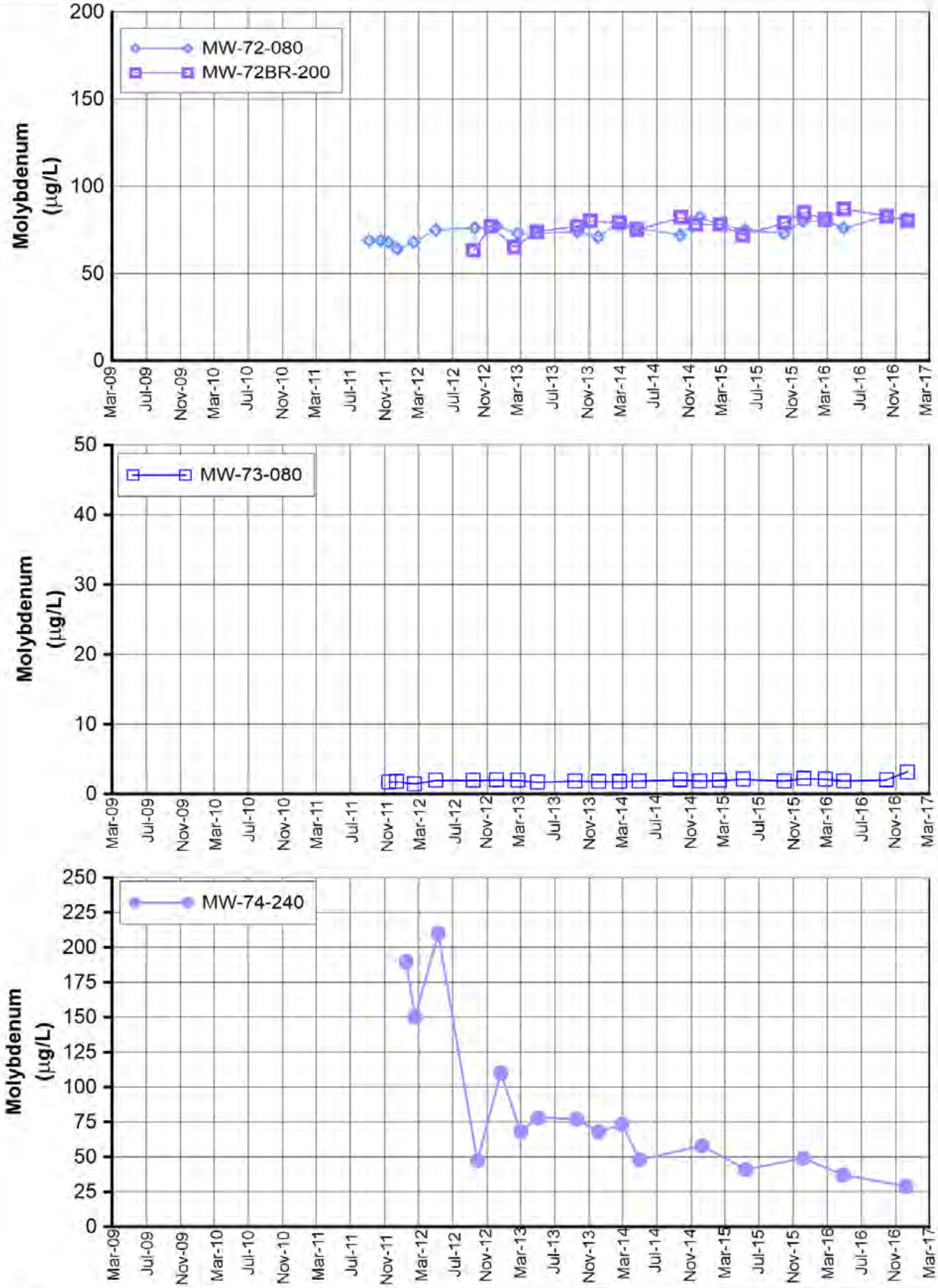
LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

1. MW-69-195 sampled using LF method on 9/29/2016 & 12/6/2016.
2. MW-70-105 sampled using LF method on 4/28/2016 & 12/14/2016.
3. MW-71-035 sampled using grab method on 12/14/2016.

FIGURE C-36
MOLYBDENUM
IN MW-69-195, THE MW-70 CLUSTER, AND MW-71-035

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS



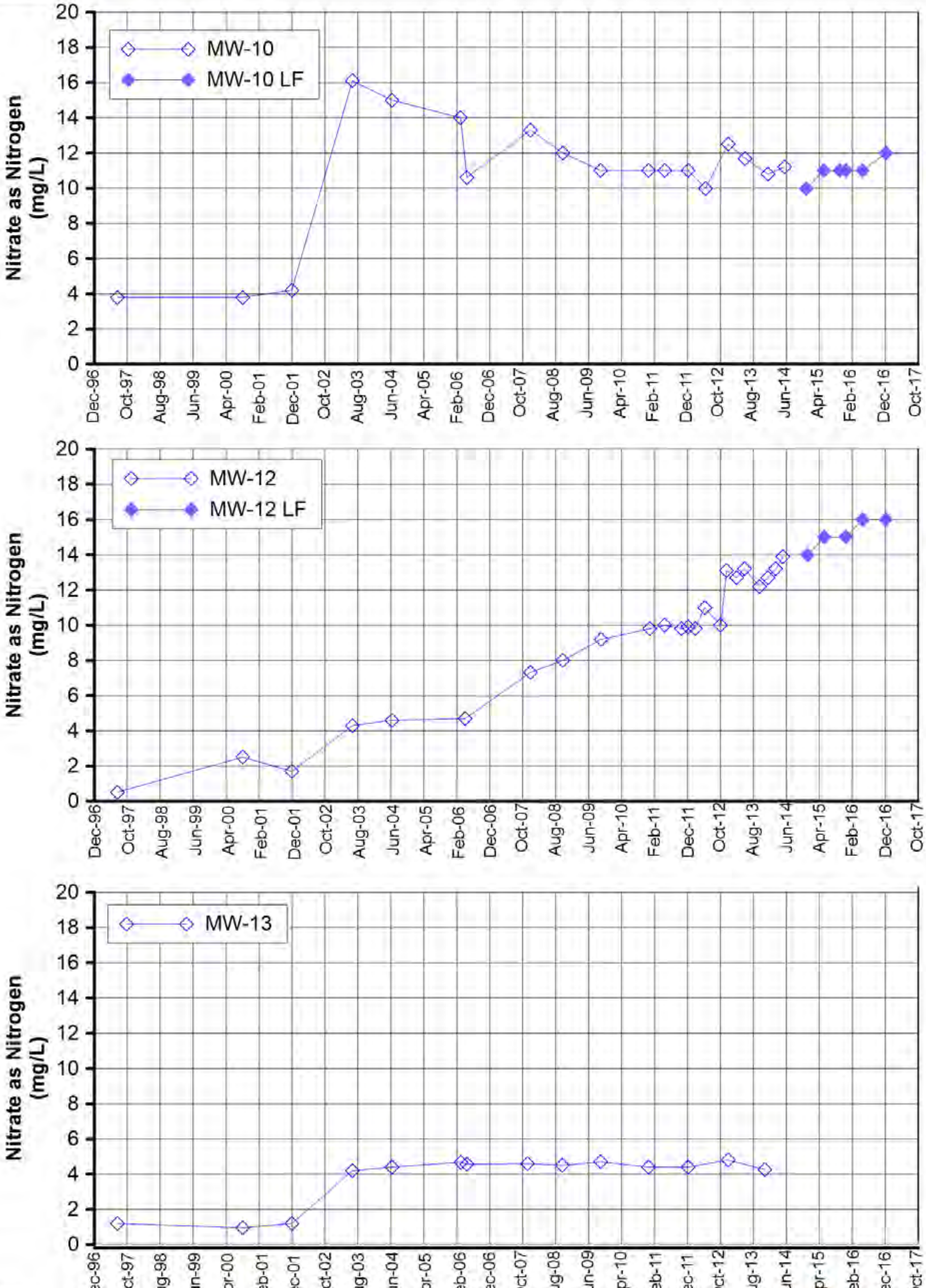
Notes:

1. MW-72-080 sampled using low flow sampling method on 9/28/2016 and 12/12/2016.
2. MW-73-080 sampled using low flow sampling method on 12/12/2016.
3. MW-74-240 sampled using low flow sampling method on 4/27/2016 and 12/8/2016.

FIGURE C-37
MOLYBDENUM
IN MW-72 CLUSTER, MW-73-080, AND MW-74-240

ARCADIS

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA



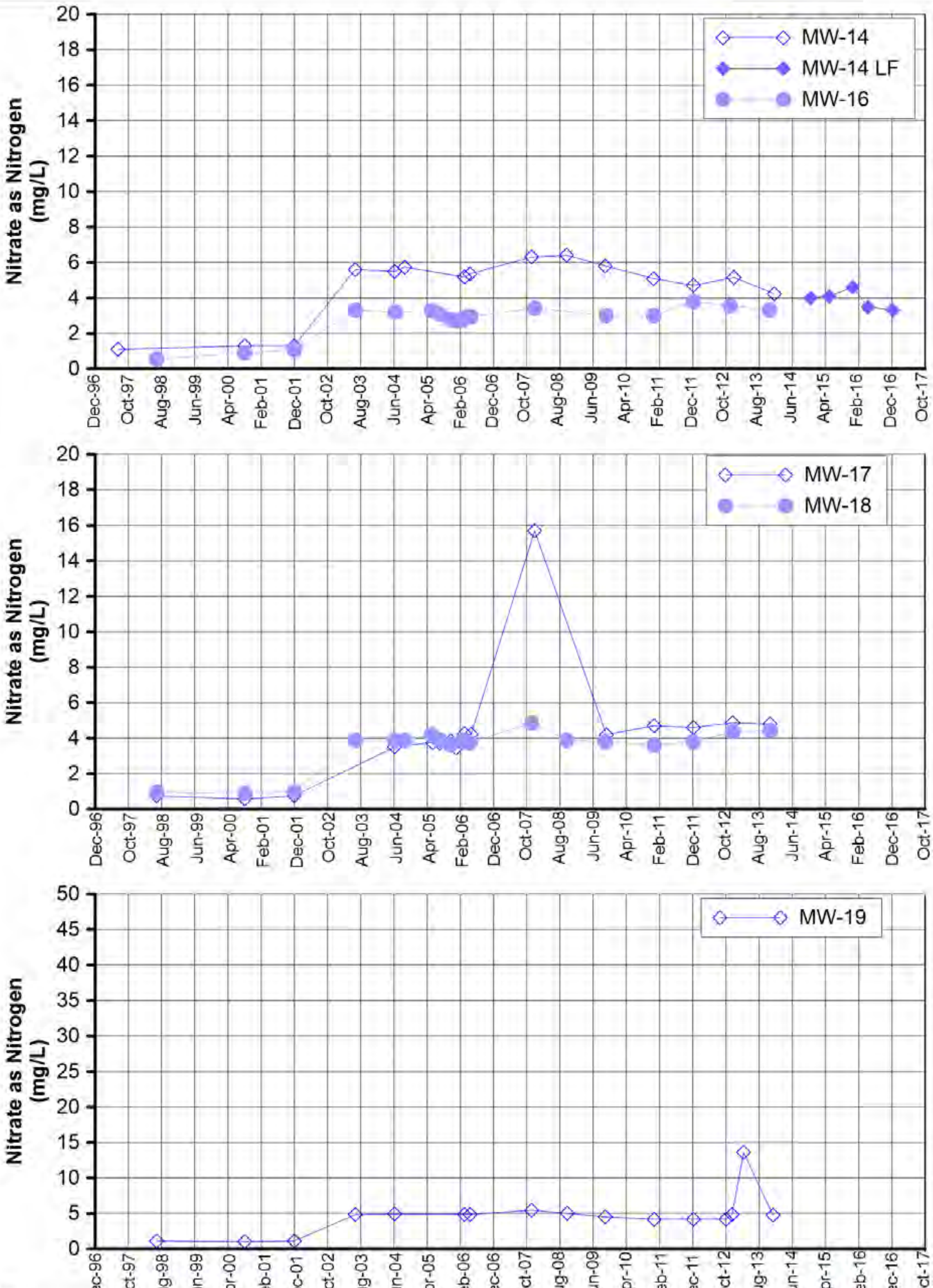
Notes:

1. Starting in Fourth Quarter 2012 nitrate samples were analyzed using method USEPA 353.2, which reports a combination of nitrate and nitrite. The contribution of nitrite to the reported result of nitrate plus nitrite as nitrogen is expected to be negligible; therefore, sample results for method USEPA 353.2 are expected to be essentially the same as previous samples analyzed using method USEPA 300.0 and reported as nitrate as nitrogen.
2. LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

FIGURE C-38
NITRATE as NITROGEN IN MW-10, MW-12, AND MW-13

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS



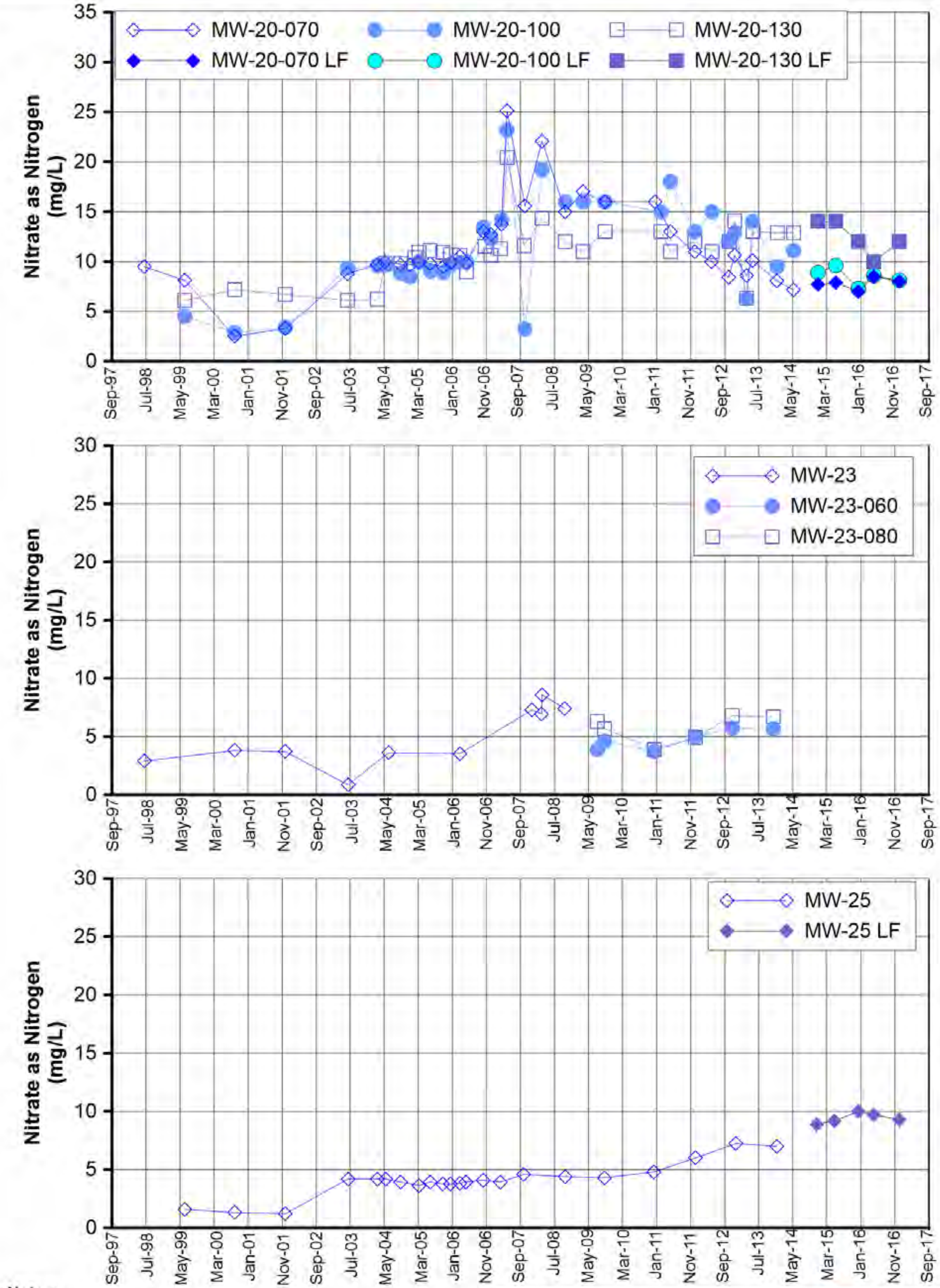
Notes:

1. Starting in Fourth Quarter 2012 nitrate samples were analyzed using method USEPA 353.2, which reports a combination of nitrate and nitrite. The contribution of nitrite to the reported result of nitrate plus nitrite as nitrogen is expected to be negligible; therefore, sample results for method USEPA 353.2 are expected to be essentially the same as previous samples analyzed using method USEPA 300.0 and reported as nitrate as nitrogen.
2. LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.
3. MW-16 and MW-17 are sampled biannually and were not sampled in 2016.

FIGURE C-39
NITRATE as NITROGEN
IN MW-14, MW-16, MW-17, MW-18, AND MW-19

ARCADIS

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA



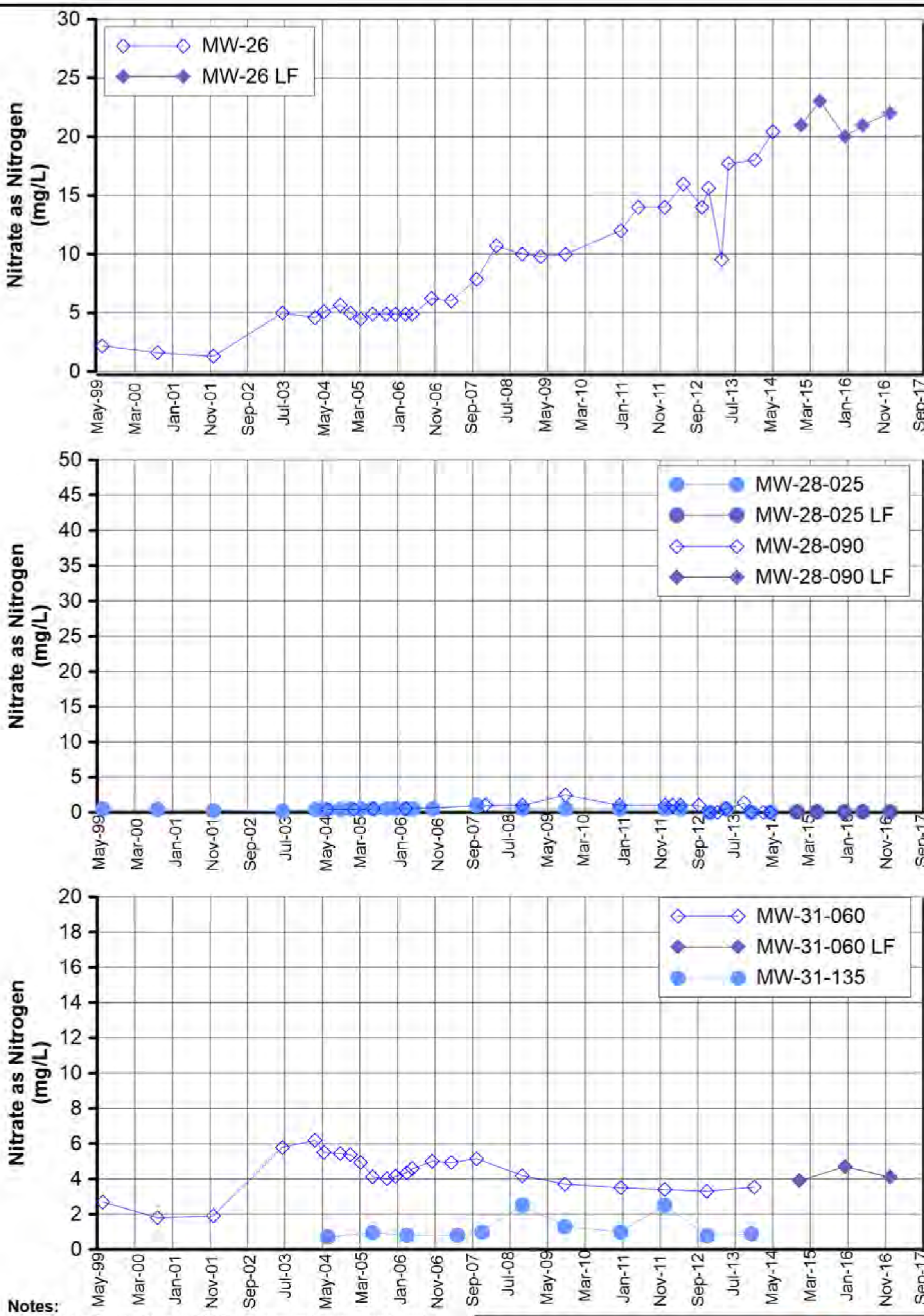
Notes:

1. Starting in Fourth Quarter 2012 nitrate samples were analyzed using method USEPA 353.2, which reports a combination of nitrate and nitrite. The contribution of nitrite to the reported result of nitrate plus nitrite as nitrogen is expected to be negligible; therefore, sample results for method USEPA 353.2 are expected to be essentially the same as previous samples analyzed using method USEPA 300.0 and reported as nitrate as nitrogen.
2. LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

FIGURE C-40
NITRATE as NITROGEN
IN MW-20, MW-23, AND MW-25 CLUSTERS

ARCADIS

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA



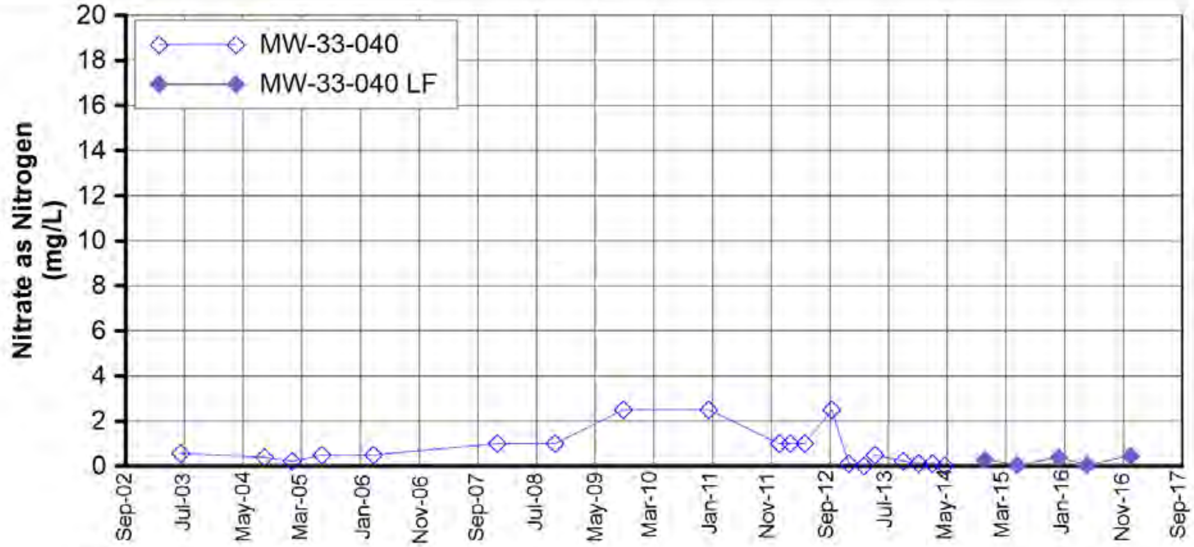
Notes:

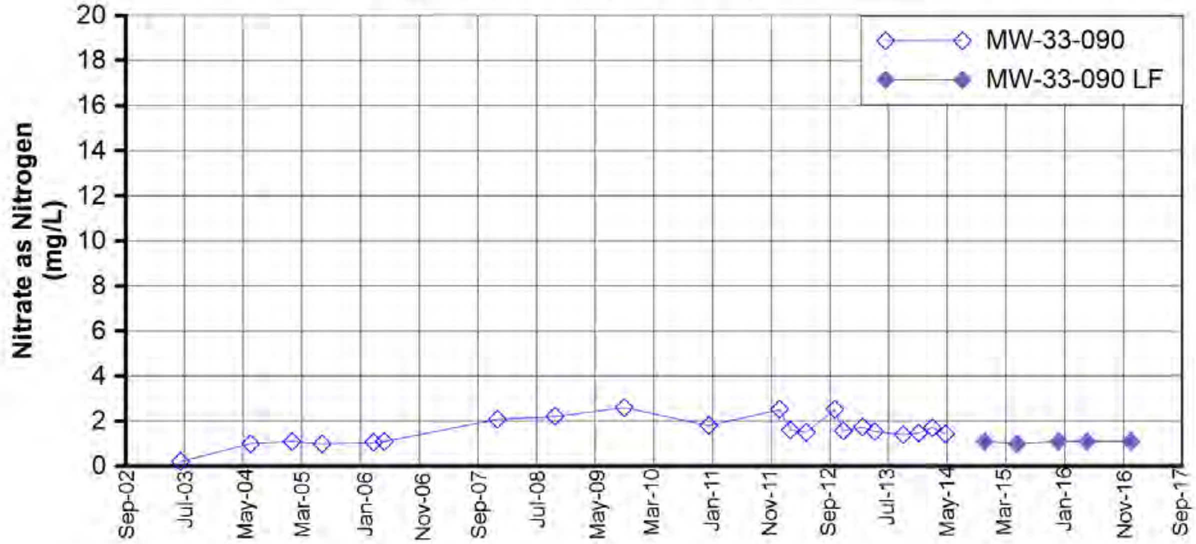
1. Starting in Fourth Quarter 2012 nitrate samples were analyzed using method USEPA 353.2, which reports a combination of nitrate and nitrite. The contribution of nitrite to the reported result of nitrate plus nitrite as nitrogen is expected to be negligible; therefore, sample results for method USEPA 353.2 are expected to be essentially the same as previous samples analyzed using method USEPA 300.0 and reported as nitrate as nitrogen.
2. LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method

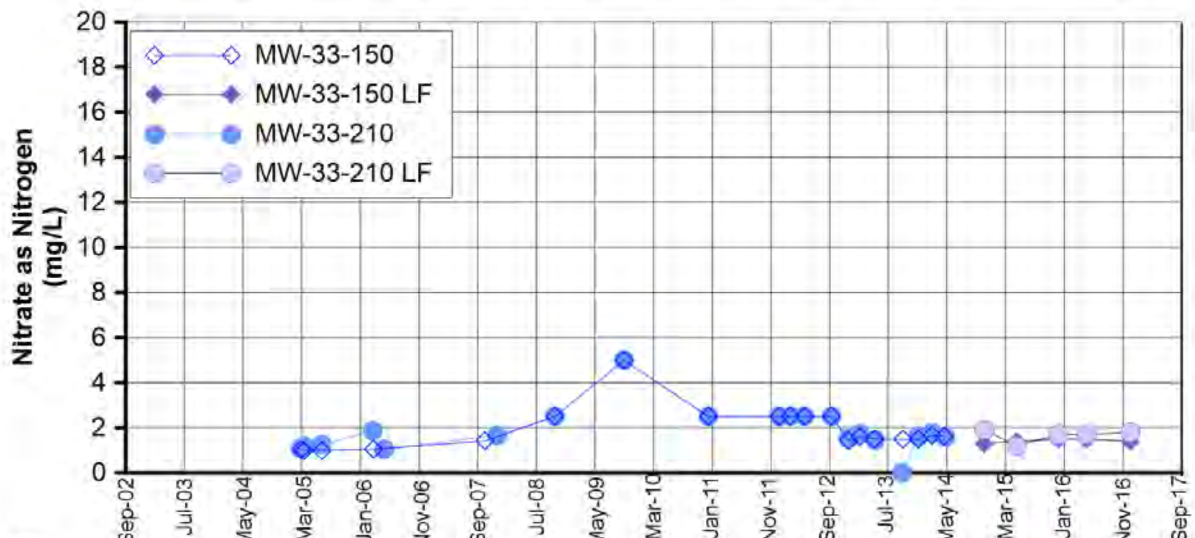
FIGURE C-41
NITRATE as NITROGEN
IN MW-26, MW-28, AND MW-31 CLUSTERS

ARCADIS

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA







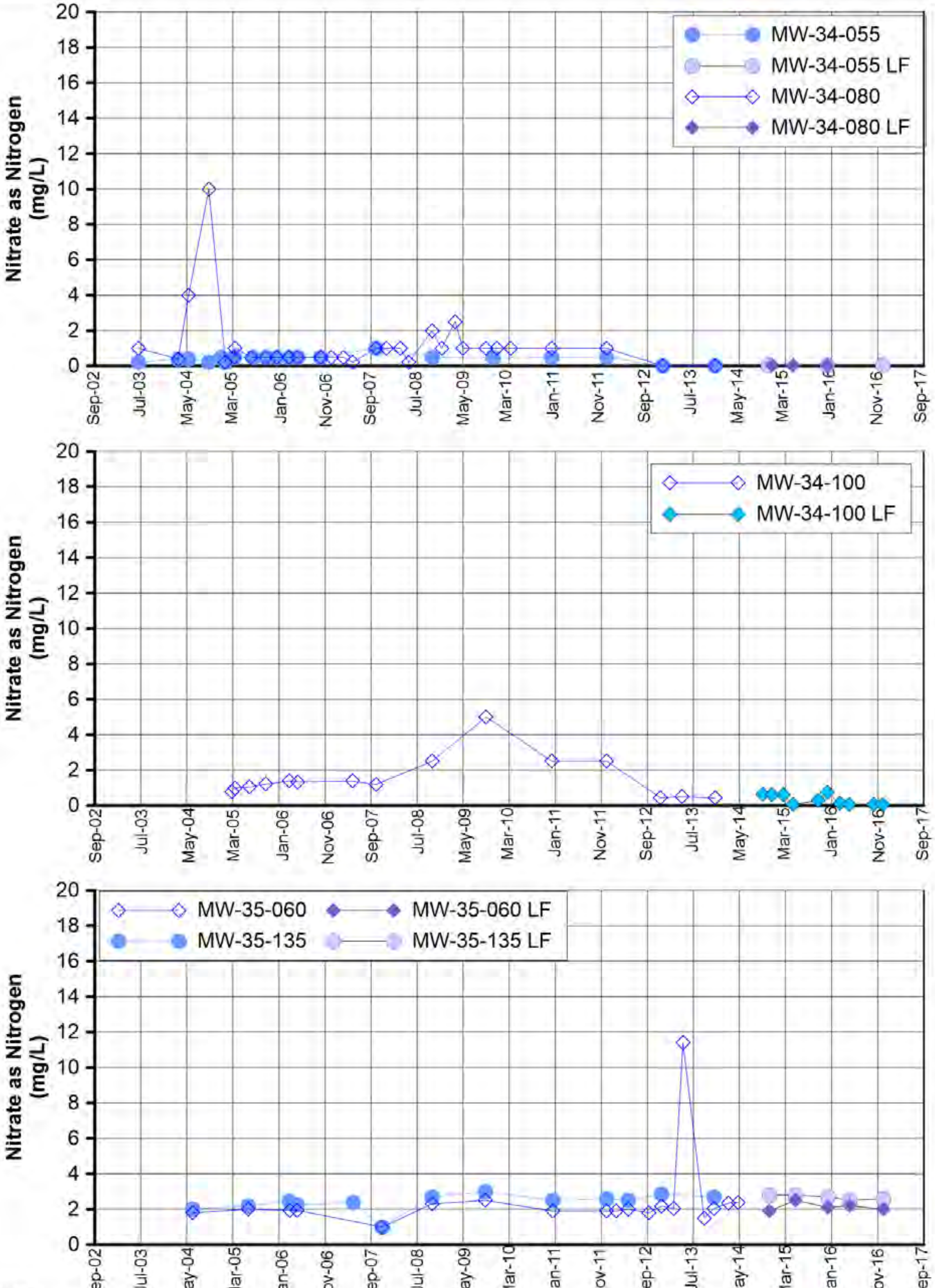
Notes:

1. Starting in Fourth Quarter 2012 nitrate samples were analyzed using method USEPA 353.2, which reports a combination of nitrate and nitrite. The contribution of nitrite to the reported result of nitrate plus nitrite as nitrogen is expected to be negligible; therefore, sample results for method USEPA 353.2 are expected to be essentially the same as previous samples analyzed using method USEPA 300.0 and reported as nitrate as nitrogen.
2. LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

FIGURE C-42
NITRATE as NITROGEN IN MW-33 CLUSTER

ARCADIS

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

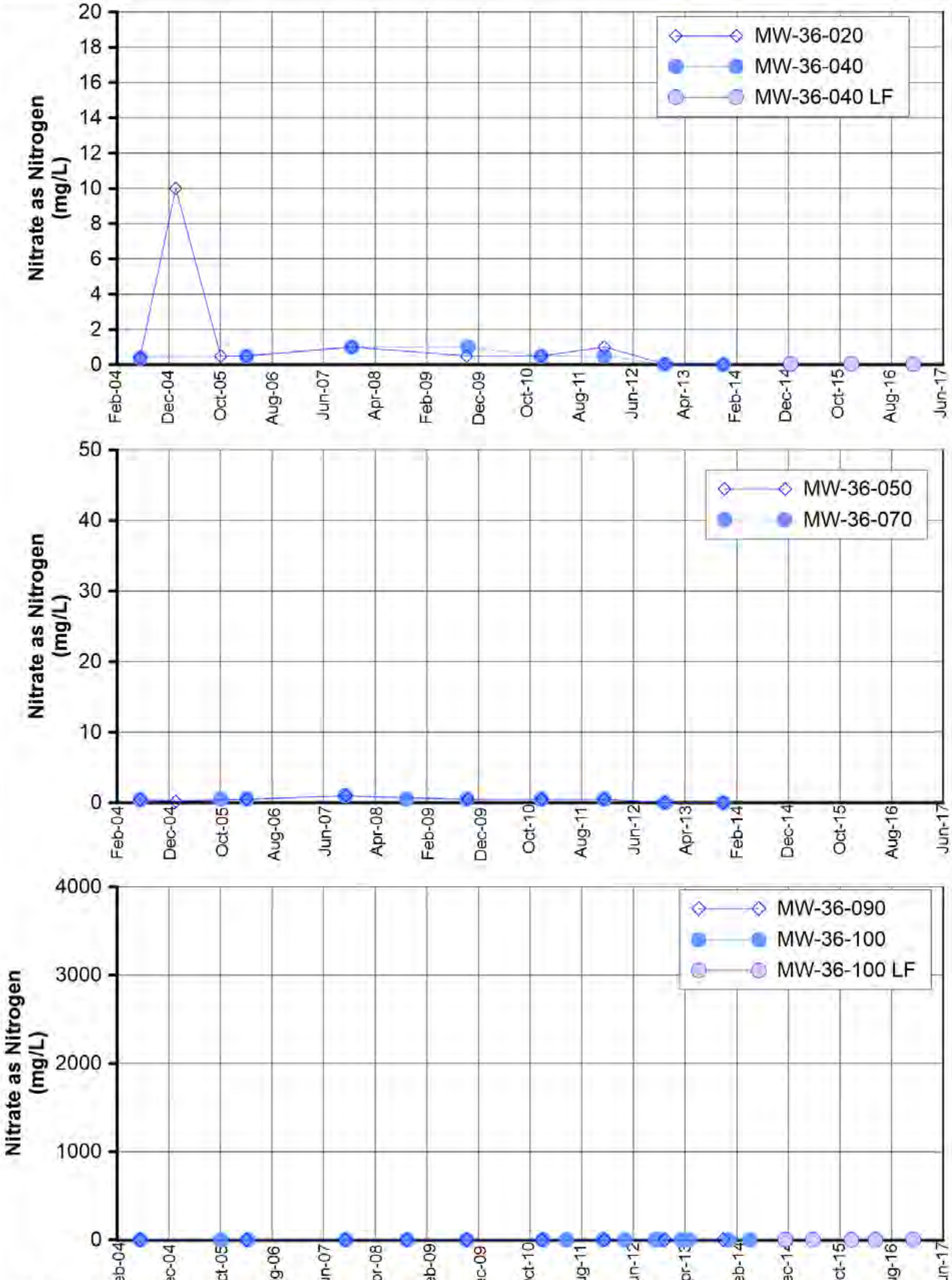


Notes:

1. Starting in Fourth Quarter 2012 nitrate samples were analyzed using method USEPA 353.2, which reports a combination of nitrate and nitrite. The contribution of nitrite to the reported result of nitrate plus nitrite as nitrogen is expected to be negligible; therefore, sample results for method USEPA 353.2 are expected to be essentially the same as previous samples analyzed using method USEPA 300.0 and reported as nitrate as nitrogen.
2. LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

FIGURE C-43
NITRATE as NITROGEN
IN MW-34 AND MW-35 CLUSTERS

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA



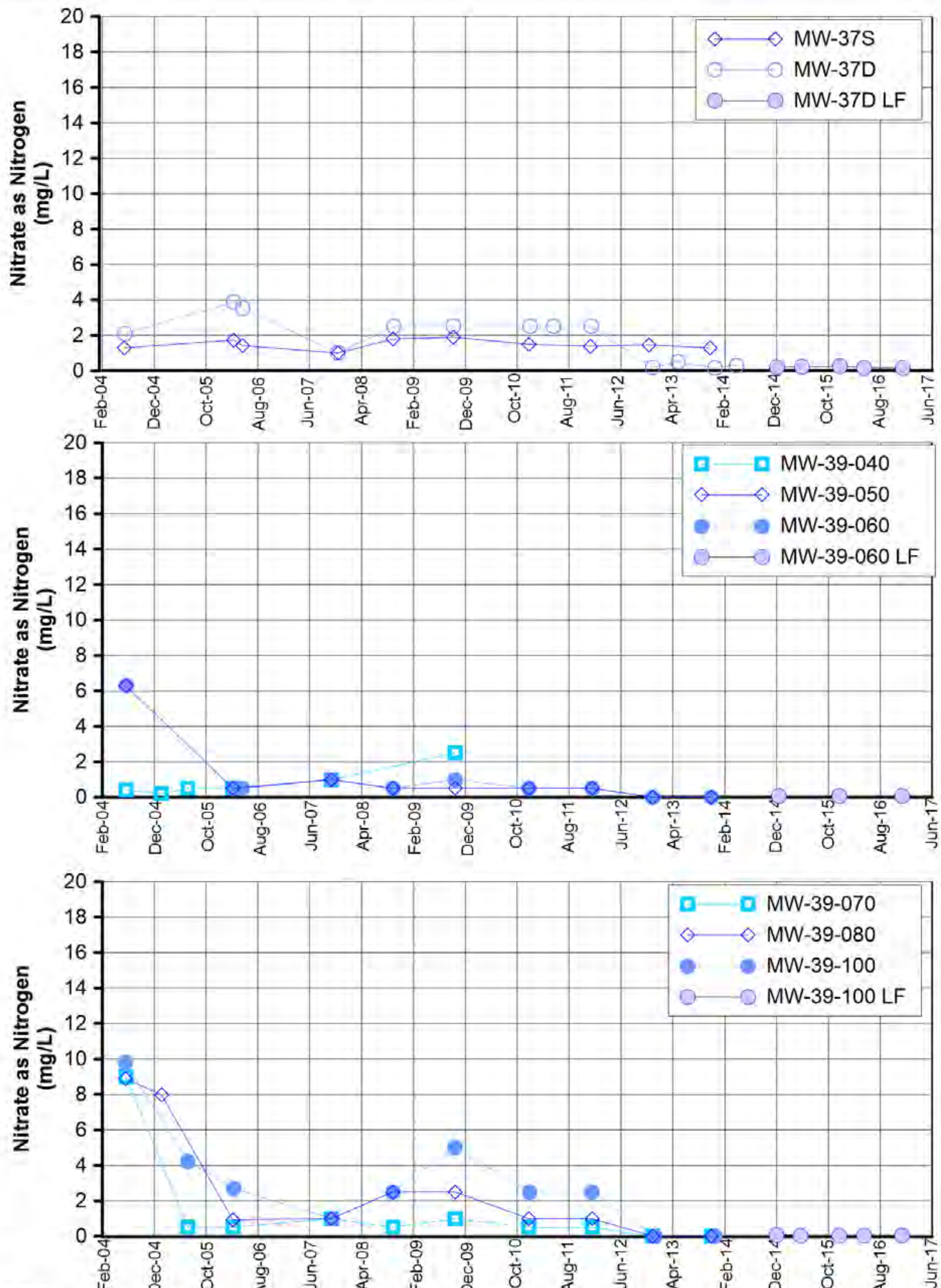
Notes:

1. Starting in Fourth Quarter 2012 nitrate samples were analyzed using method USEPA 353.2, which reports a combination of nitrate and nitrite. The contribution of nitrite to the reported result of nitrate plus nitrite as nitrogen is expected to be negligible; therefore, sample results for method USEPA 353.2 are expected to be essentially the same as previous samples analyzed using method USEPA 300.0 and reported as nitrate as nitrogen.
2. LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

FIGURE C-44
NITRATE as NITROGEN
IN MW-36 CLUSTER

ARCADIS

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA



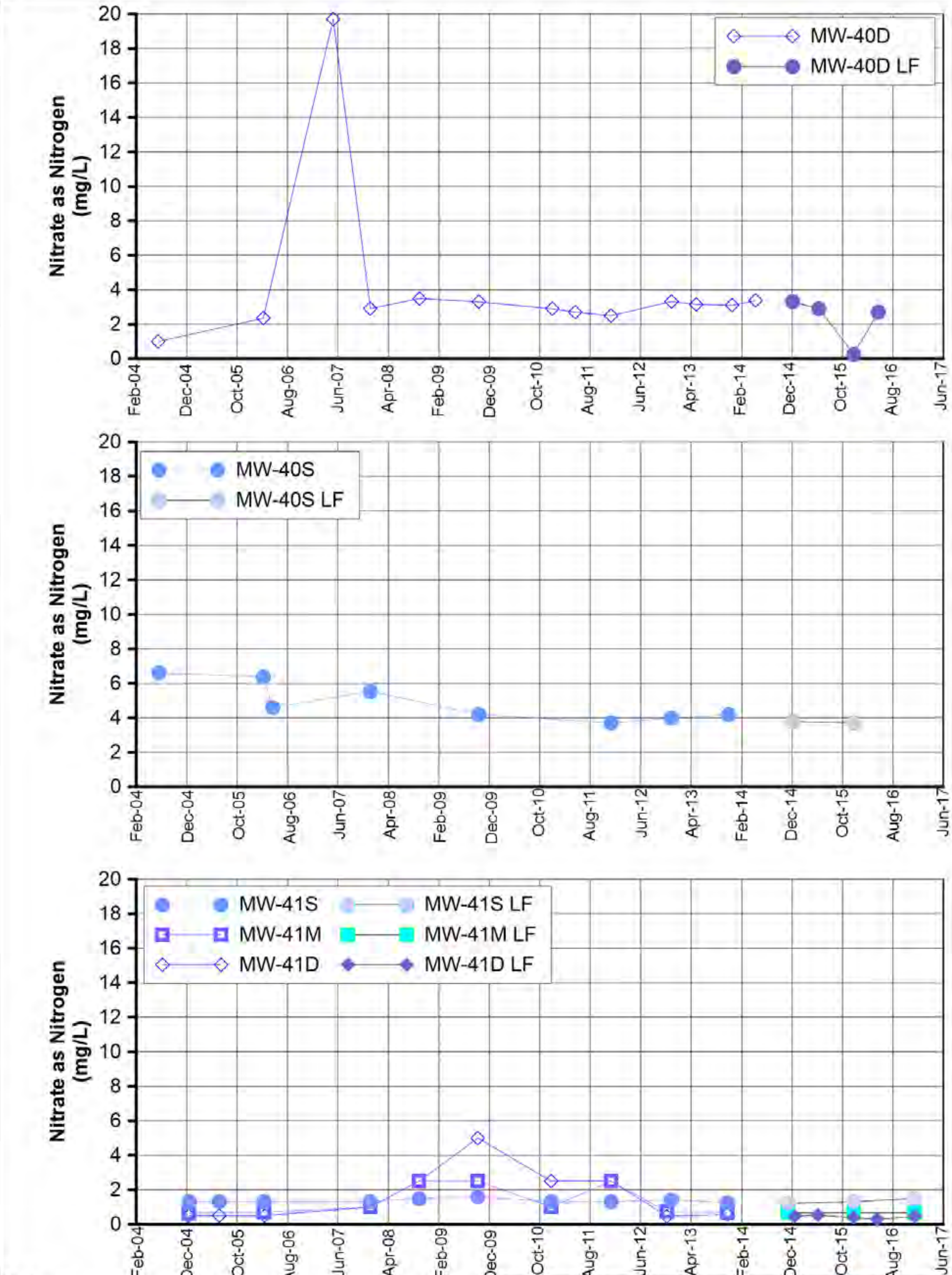
Notes:

1. Starting in Fourth Quarter 2012 nitrate samples were analyzed using method USEPA 353.2, which reports a combination of nitrate and nitrite. The contribution of nitrite to the reported result of nitrate plus nitrite as nitrogen is expected to be negligible; therefore, sample results for method USEPA 353.2 are expected to be essentially the same as previous samples analyzed using method USEPA 300.0 and reported as nitrate as nitrogen.
2. LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

FIGURE C-45
NITRATE as NITROGEN IN MW-37 AND MW-39 CLUSTERS

ARCADIS

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA



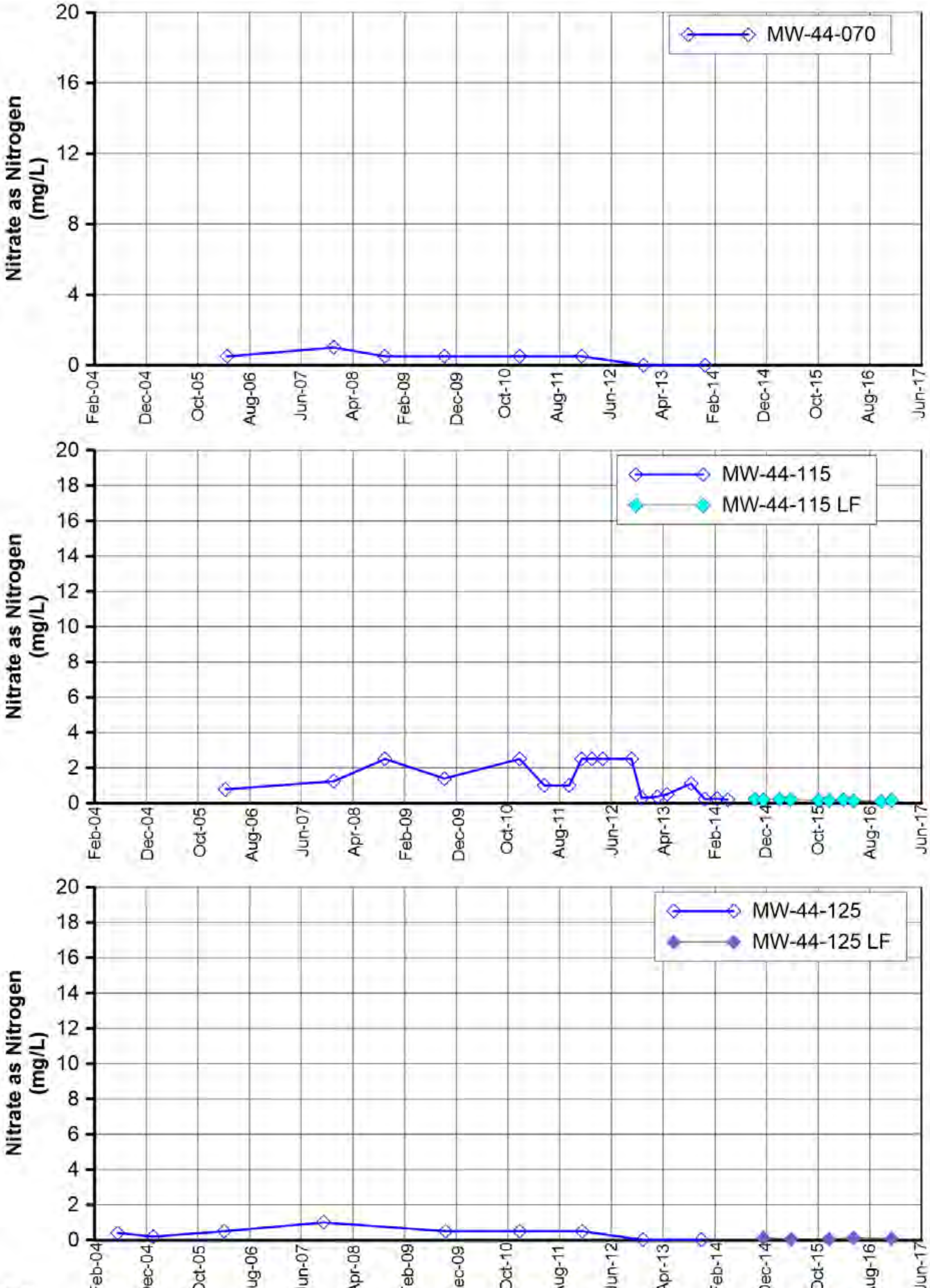
Notes:

1. Starting in Fourth Quarter 2012 nitrate samples were analyzed using method USEPA 353.2, which reports a combination of nitrate and nitrite. The contribution of nitrite to the reported result of nitrate plus nitrite as nitrogen is expected to be negligible; therefore, sample results for method USEPA 353.2 are expected to be essentially the same as previous samples analyzed using method USEPA 300.0 and reported as nitrite as nitrogen.
2. LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.
3. MW-40D and MW-40S were not sampled during 4th Quarter 2016 due to traffic control issues.

FIGURE C-46
NITRATE as NITROGEN
IN MW-40 AND MW-41 CLUSTERS

ARCADIS

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA



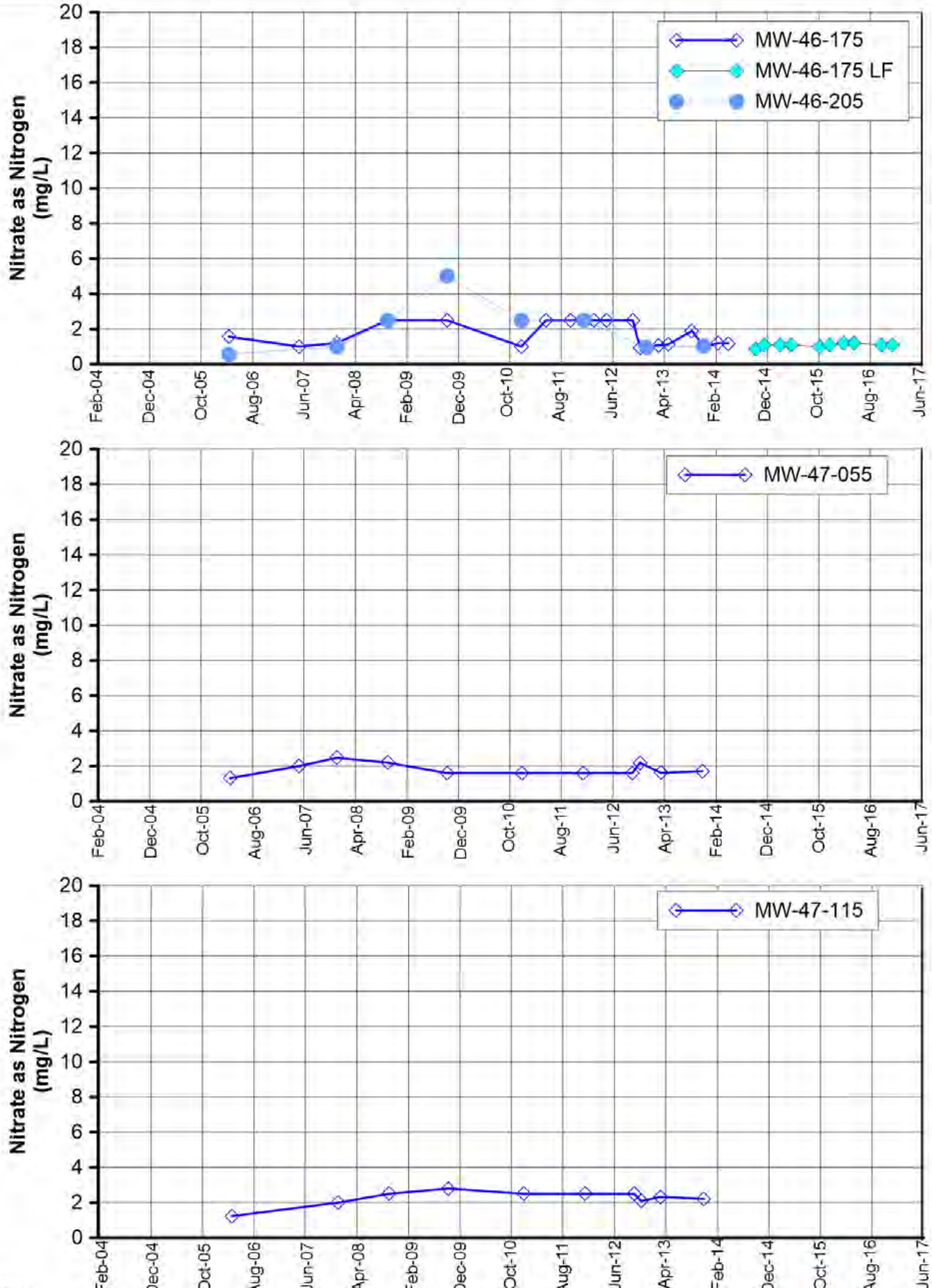
Notes:

1. Starting in Fourth Quarter 2012 nitrate samples were analyzed using method USEPA 353.2, which reports a combination of nitrate and nitrite. The contribution of nitrite to the reported result of nitrate plus nitrite as nitrogen is expected to be negligible; therefore, sample results for method USEPA 353.2 are expected to be essentially the same as previous samples analyzed using method USEPA 300.0 and reported as nitrate as nitrogen.
2. LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

FIGURE C-47
NITRATE as NITROGEN IN MW-44 CLUSTER

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS



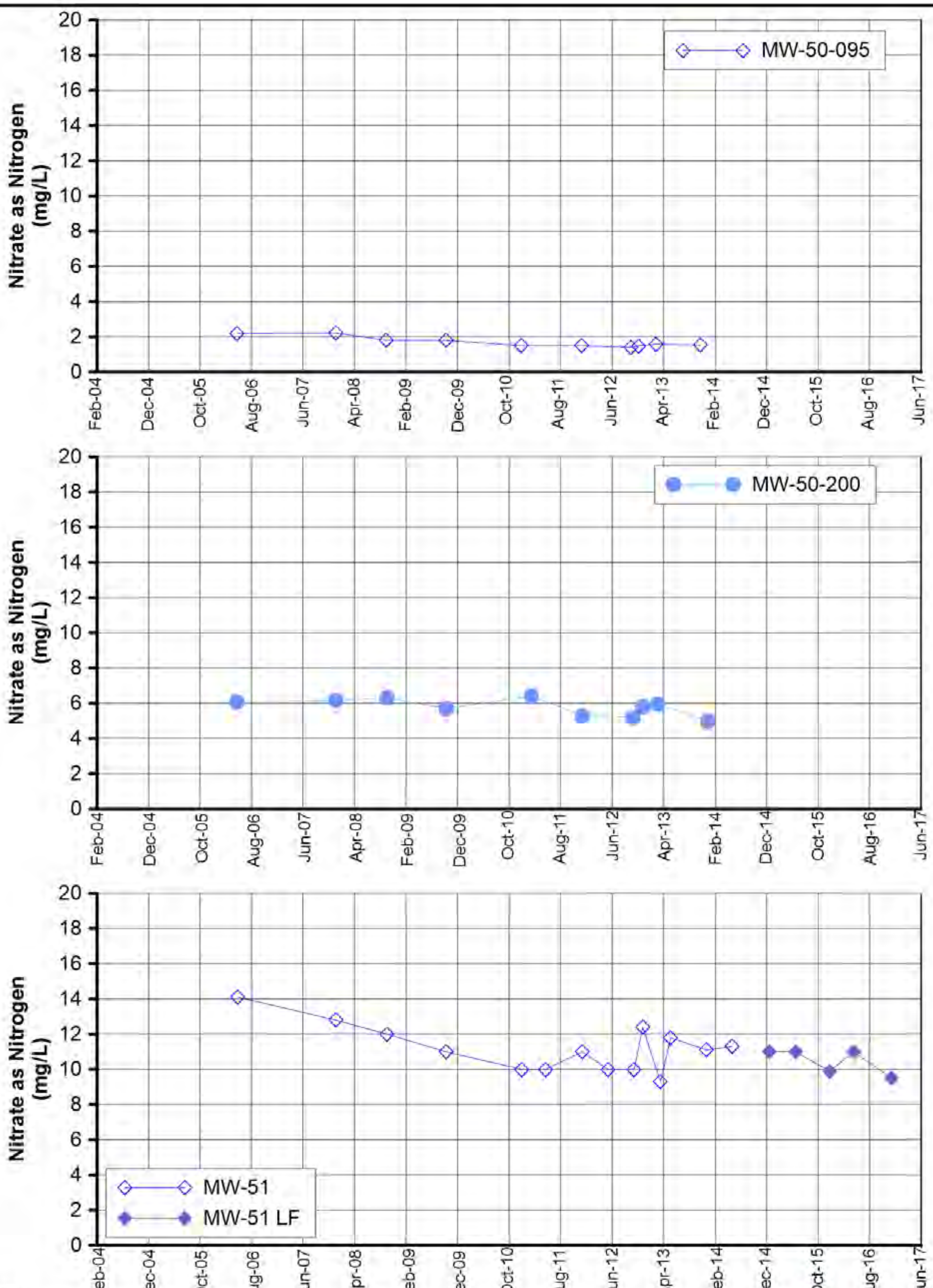
Notes:

1. Starting in Fourth Quarter 2012 nitrate samples were analyzed using method USEPA 353.2, which reports a combination of nitrate and nitrite. The contribution of nitrite to the reported result of nitrate plus nitrite as nitrogen is expected to be negligible; therefore, sample results for method USEPA 353.2 are expected to be essentially the same as previous samples analyzed using method USEPA 300.0 and reported as nitrate as nitrogen.
2. LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

FIGURE C-48
NITRATE as NITROGEN
IN MW-46 AND MW-47 CLUSTERS

ARCADIS

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA



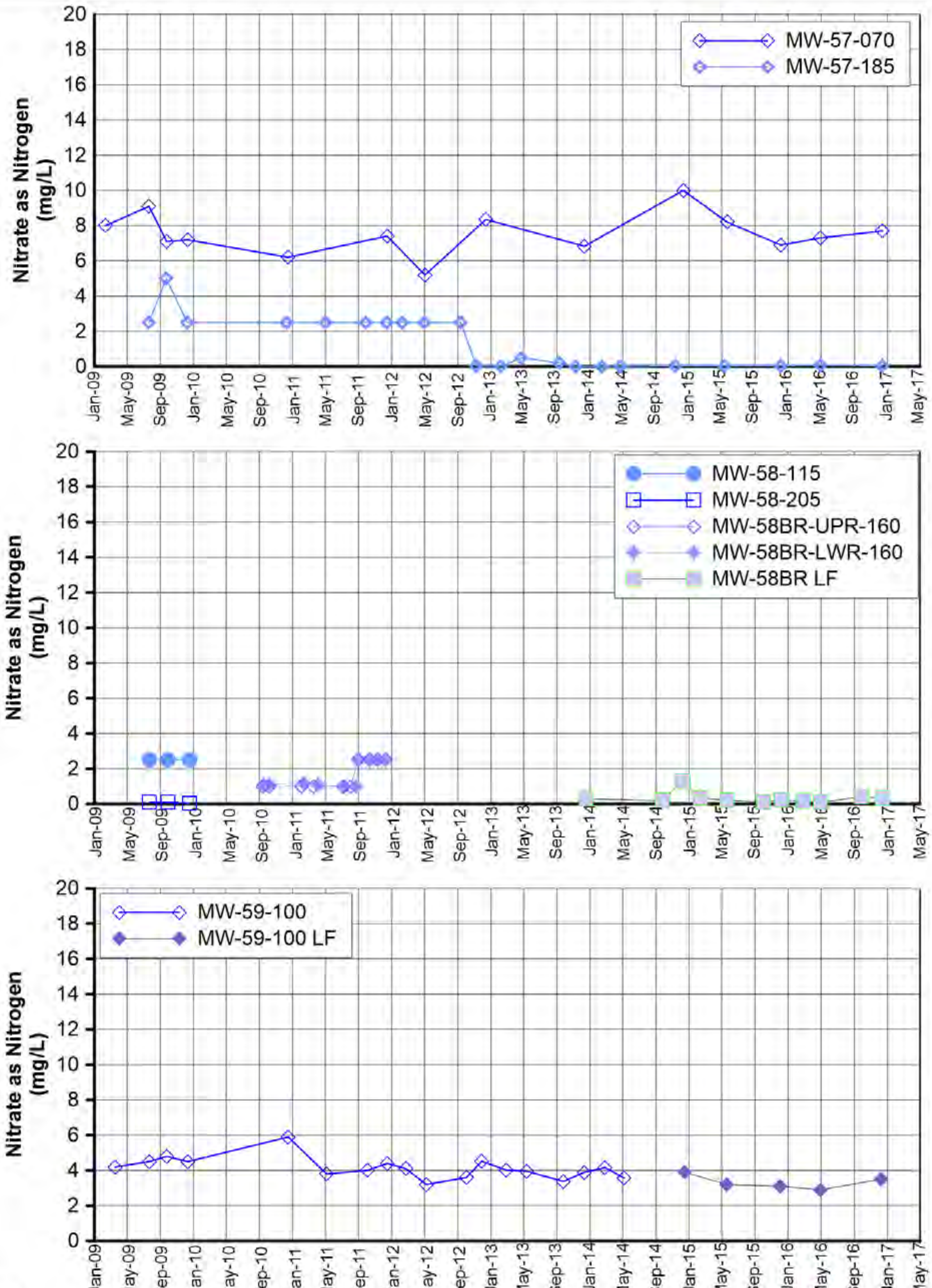
Notes:

1. Starting in Fourth Quarter 2012 nitrate samples were analyzed using method USEPA 353.2, which reports a combination of nitrate and nitrite. The contribution of nitrite to the reported result of nitrate plus nitrite as nitrogen is expected to be negligible; therefore, sample results for method USEPA 353.2 are expected to be essentially the same as previous samples analyzed using method USEPA 300.0 and reported as nitrate as nitrogen.
2. LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

FIGURE C-49
NITRATE as NITROGEN
IN MW-50 AND MW-51 CLUSTERS

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS



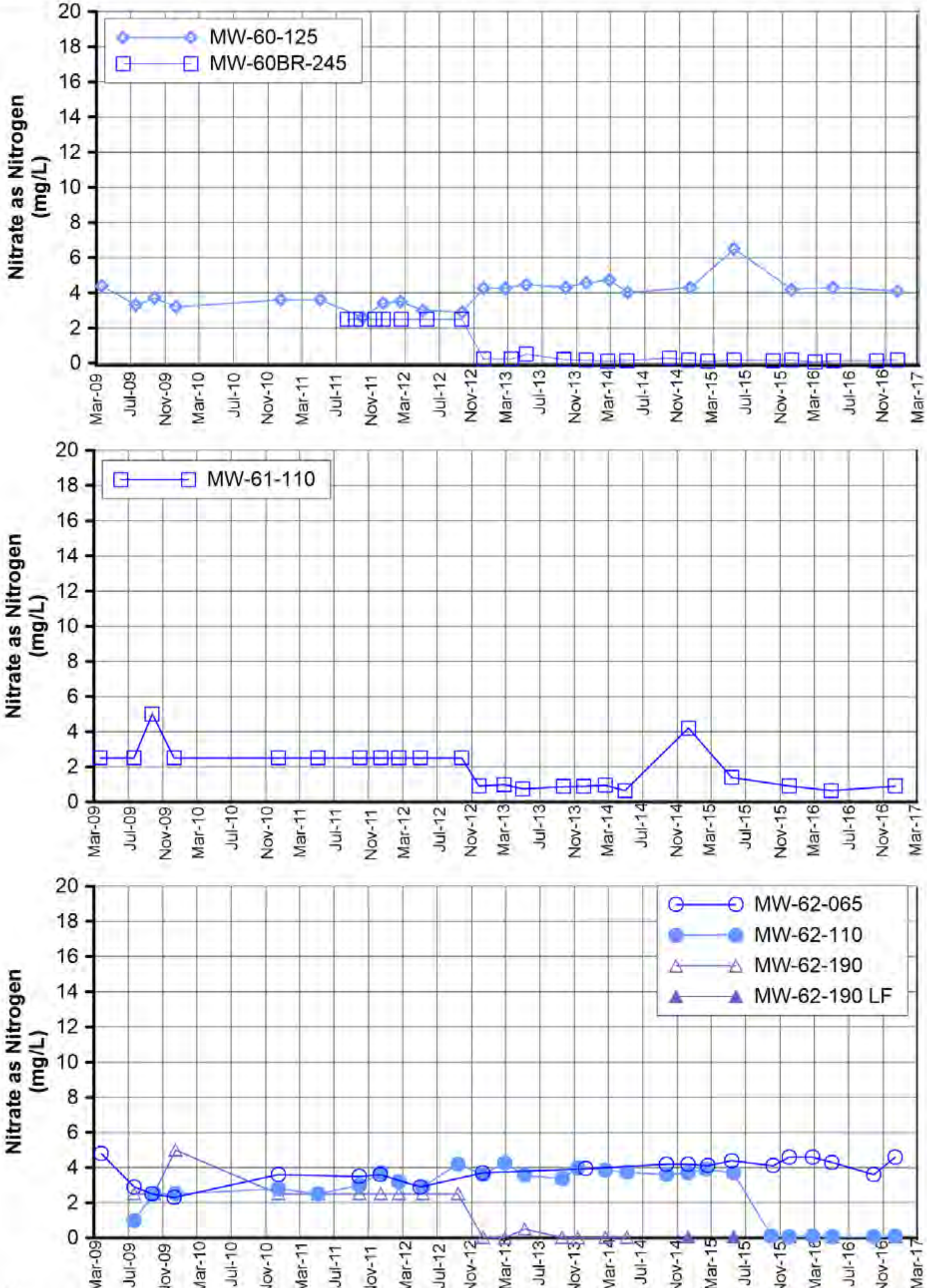
Notes:

1. Starting in Fourth Quarter 2012 nitrate samples were analyzed using method USEPA 353.2, which reports a combination of nitrate and nitrite. The contribution of nitrite to the reported result of nitrate plus nitrite as nitrogen is expected to be negligible; therefore, sample results for method USEPA 353.2 are expected to be essentially the same as previous samples analyzed using method USEPA 300.0 and reported as nitrate as nitrogen.
2. LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

FIGURE C-50
NITRATE as NITROGEN
IN MW-57 CLUSTER, MW-58 CLUSTER AND MW-59-100

ARCADIS

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA



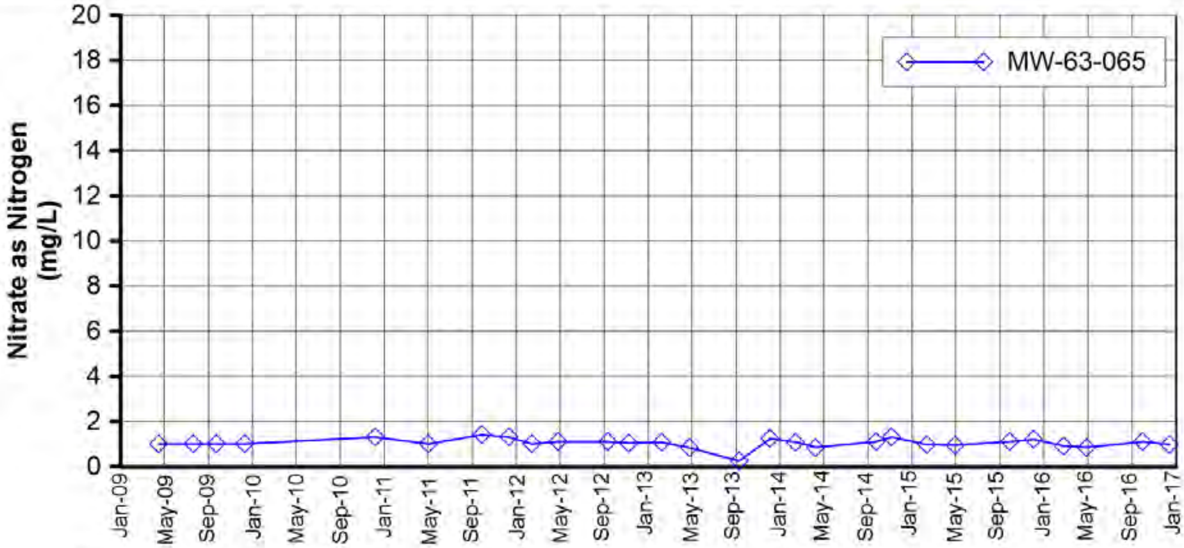
Notes:

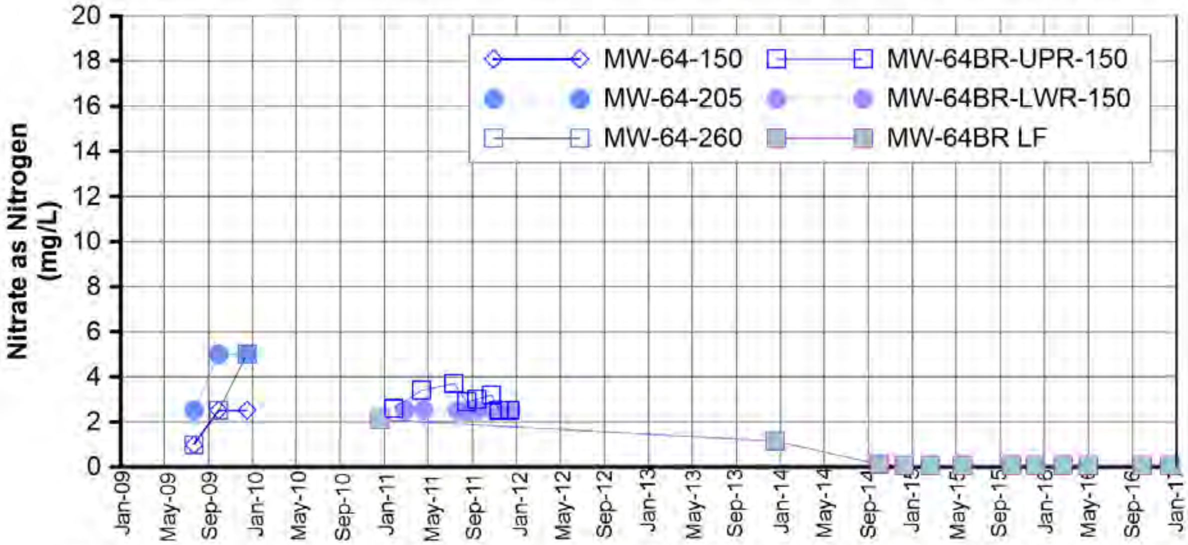
1. Starting in Fourth Quarter 2012 nitrate samples were analyzed using method USEPA 353.2, which reports a combination of nitrate and nitrite. The contribution of nitrite to the reported result of nitrate plus nitrite as nitrogen is expected to be negligible; therefore, sample results for method USEPA 353.2 are expected to be essentially the same as previous samples analyzed using method USEPA 300.0 and reported as nitrate as nitrogen.
2. LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

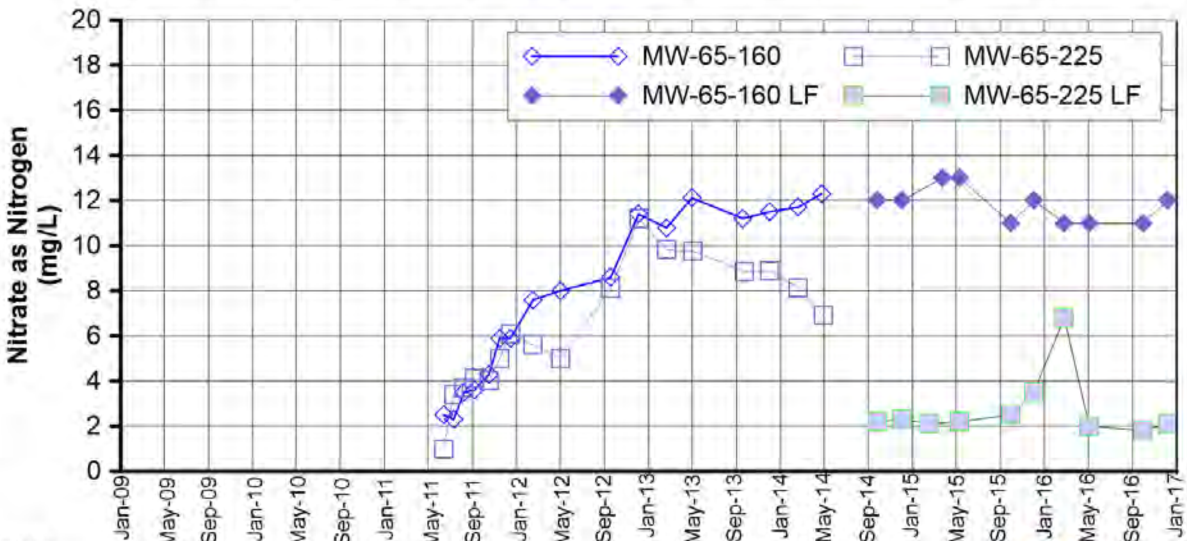
FIGURE C-51
NITRATE as NITROGEN
IN MW-60 CLUSTER, MW-61-110, AND MW-62 CLUSTER

ARCADIS

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA





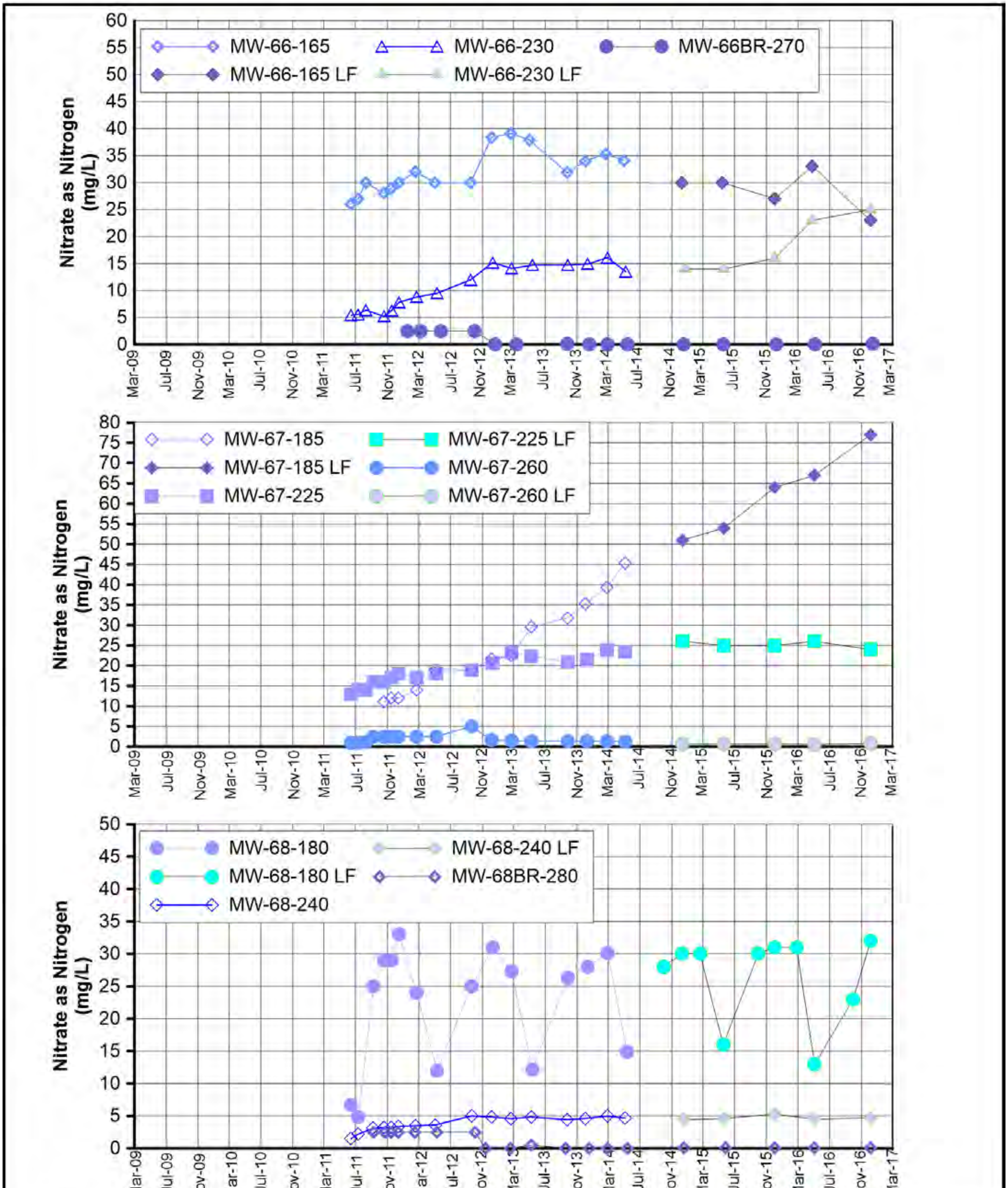


Notes:

1. Starting in Fourth Quarter 2012 nitrate samples were analyzed using method USEPA 353.2, which reports a combination of nitrate and nitrite. The contribution of nitrite to the reported result of nitrate plus nitrite as nitrogen is expected to be negligible; therefore, sample results for method USEPA 353.2 are expected to be essentially the same as previous samples analyzed using method USEPA 300.0 and reported as nitrate as nitrogen.
2. LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

FIGURE C-52
NITRATE as NITROGEN
IN MW-63-065, MW-64 CLUSTER AND MW-65 CLUSTER

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA



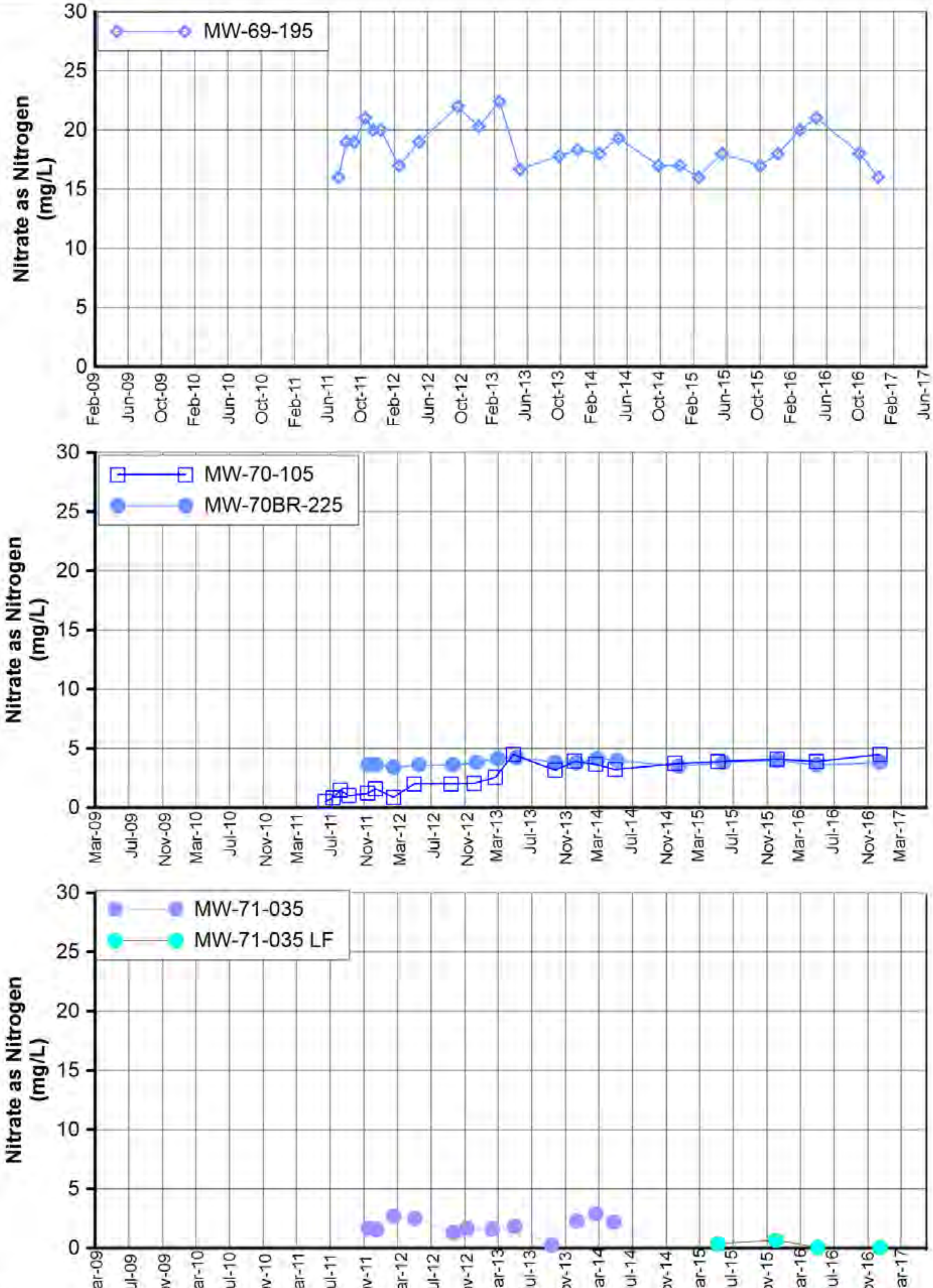
Notes:

1. Starting in Fourth Quarter 2012 nitrate samples were analyzed using method USEPA 353.2, which reports a combination of nitrate and nitrite. The contribution of nitrite to the reported result of nitrate plus nitrite as nitrogen is expected to be negligible; therefore, sample results for method USEPA 353.2 are expected to be essentially the same as previous samples analyzed using method USEPA 300.0 and reported as nitrate as nitrogen.
2. LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

FIGURE C-53
NITRATE as NITROGEN IN MW-66, MW-67, AND MW-68 CLUSTERS

ARCADIS

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

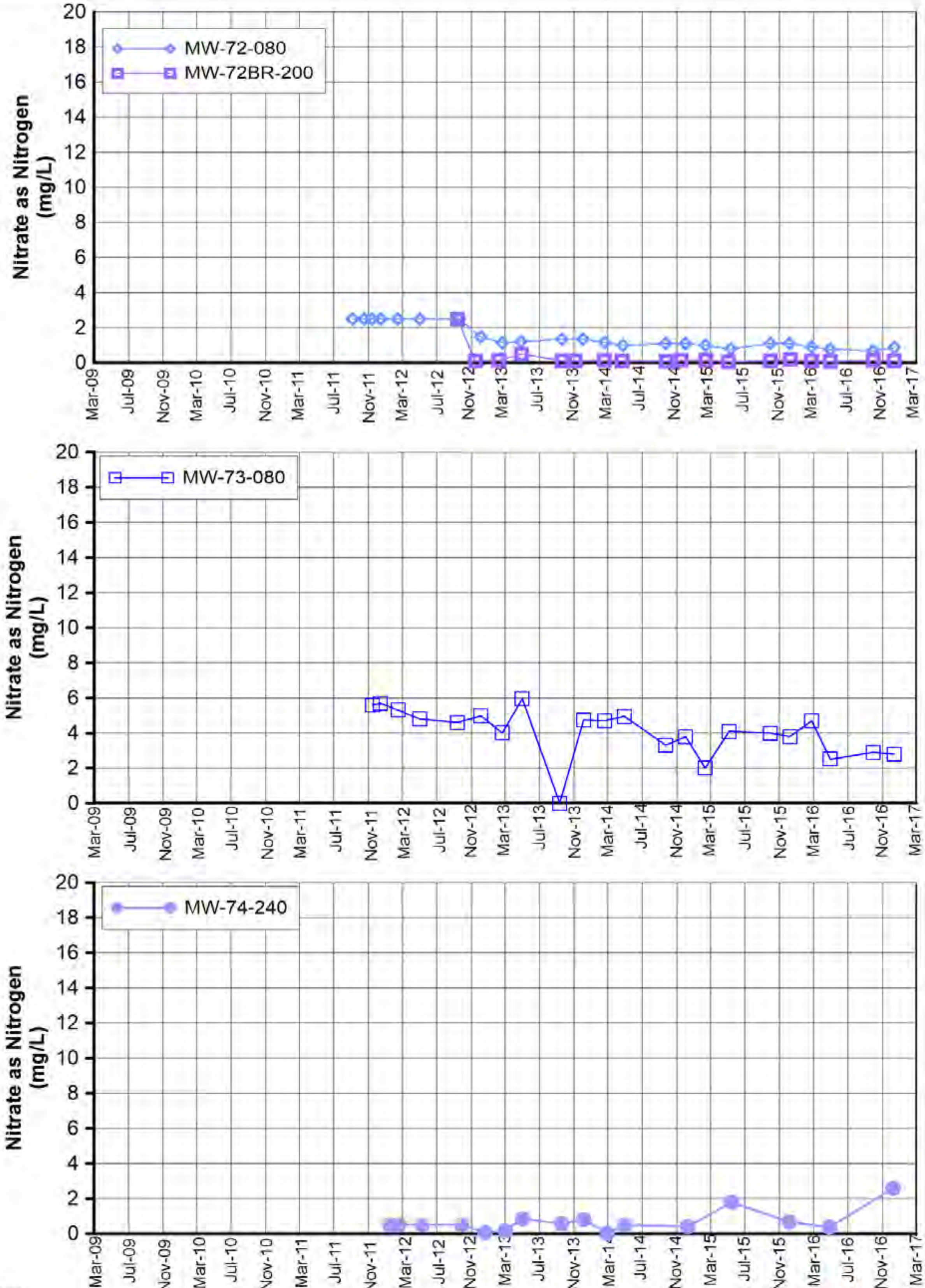


Notes:

1. Starting in Fourth Quarter 2012 nitrate samples were analyzed using method USEPA 353.2, which reports a combination of nitrate and nitrite. The contribution of nitrite to the reported result of nitrate plus nitrite as nitrogen is expected to be negligible; therefore, sample results for method USEPA 353.2 are expected to be essentially the same as previous samples analyzed using method USEPA 300.0 and reported as nitrate as nitrogen.
2. LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

FIGURE C-54
NITRATE as NITROGEN
IN MW-69-195, THE MW-70 CLUSTER, AND MW-71-035
FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS



Notes:

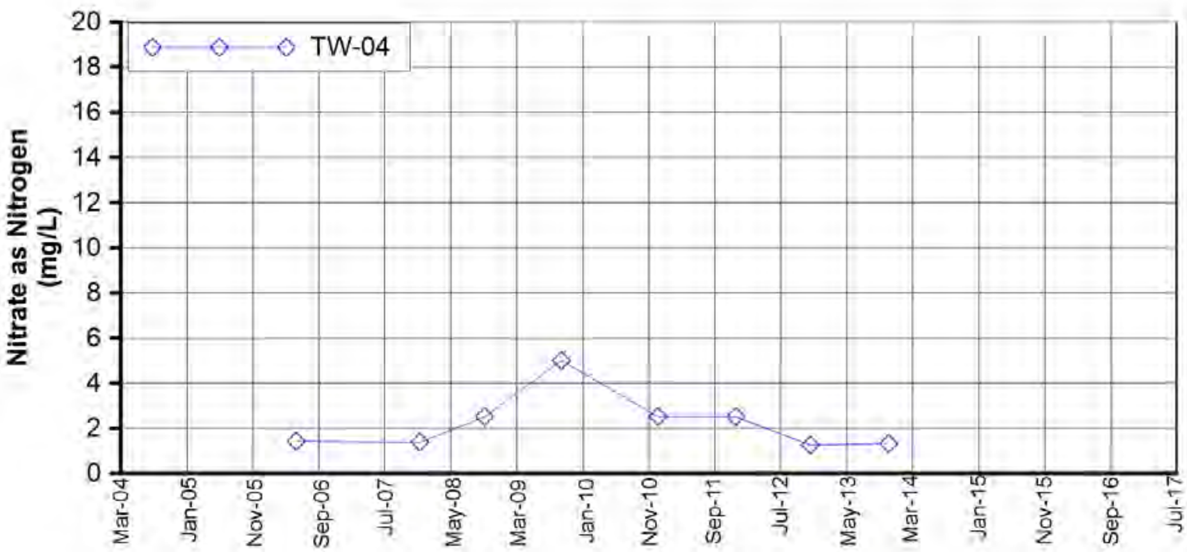
1. Starting in Fourth Quarter 2012 nitrate samples were analyzed using method USEPA 353.2, which reports a combination of nitrate and nitrite. The contribution of nitrite to the reported result of nitrate plus nitrite as nitrogen is expected to be negligible; therefore, sample results for method USEPA 353.2 are expected to be essentially the same as previous samples analyzed using method USEPA 300.0 and reported as nitrate as nitrogen.
2. LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

FIGURE C-55
NITRATE as NITROGEN
IN MW-72 CLUSTER, MW-73-080, AND MW-74-240

ARCADIS

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

\\arcadis-us.com\officedata\Denver-CO-Technical\Aproject\PG&E - Groundwater Monitoring\Reporting\00_Arcadis_rpts\02_GMP_rpts\05_Q416



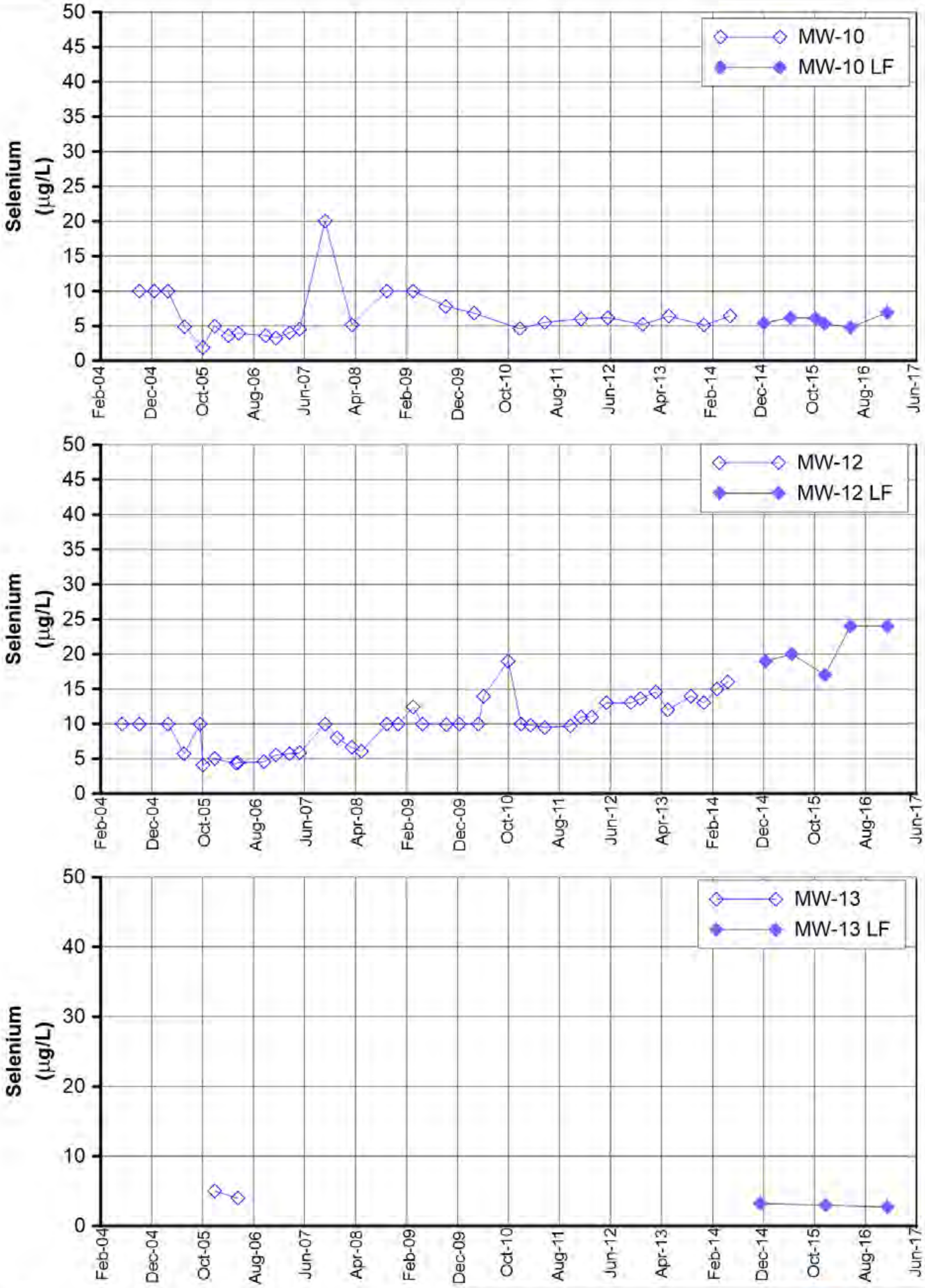
Notes:

1. Starting in Fourth Quarter 2012 nitrate samples were analyzed using method USEPA 353.2, which reports a combination of nitrate and nitrite. The contribution of nitrite to the reported result of nitrate plus nitrite as nitrogen is expected to be negligible; therefore, sample results for method USEPA 353.2 are expected to be essentially the same as previous samples analyzed using method USEPA 300.0 and reported as nitrate as nitrogen.
2. TW-04 is sampled biannually and was not sampled in 2016.

FIGURE C-56
NITRATE as NITROGEN
IN TW-04

ARCADIS

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA



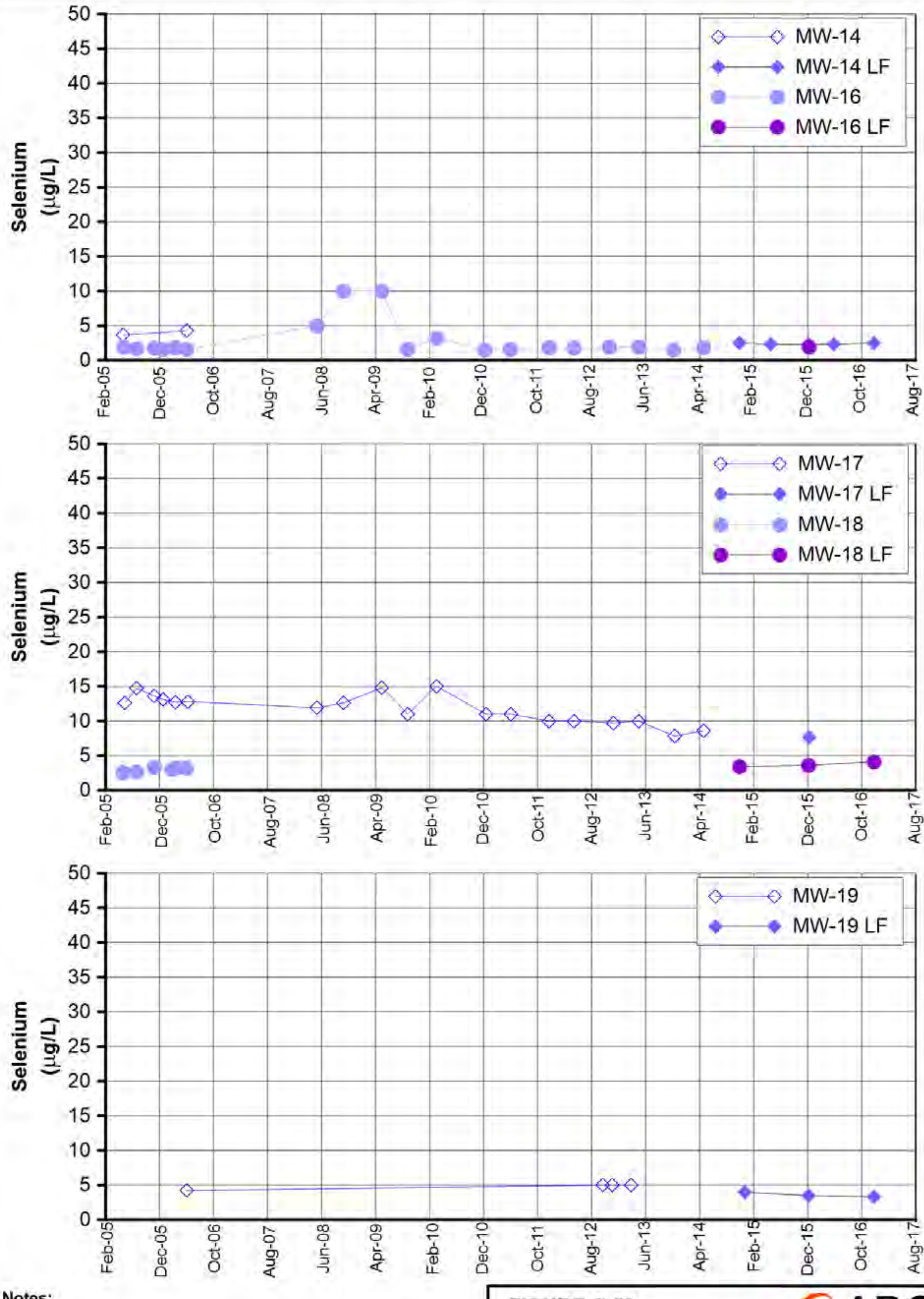
Notes:

LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

FIGURE C-57
SELENIUM
IN MW-10, MW-12, AND MW-13

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS



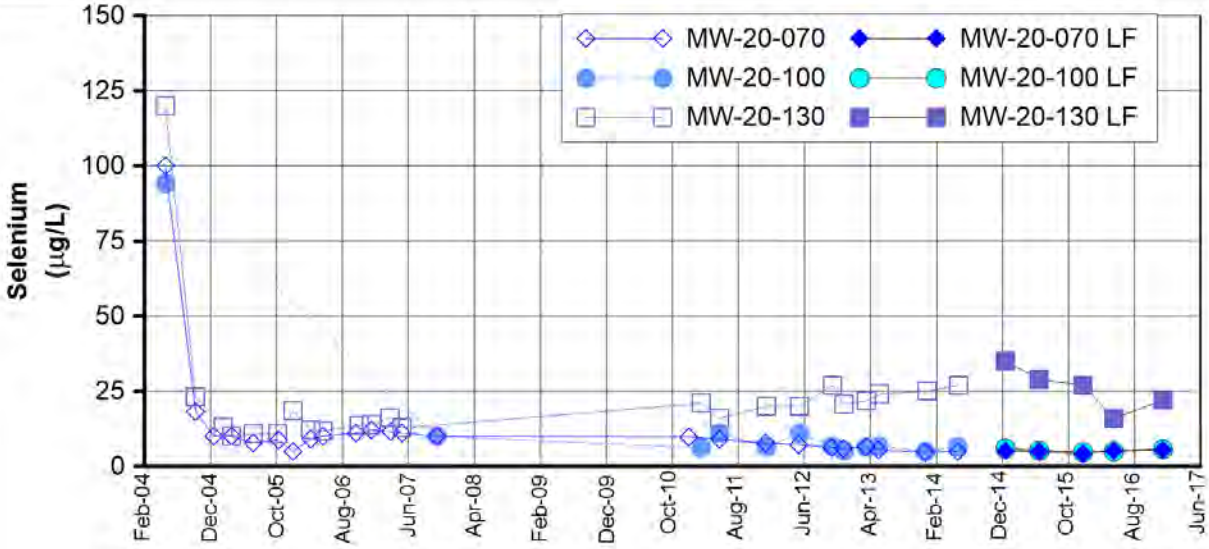
Notes:

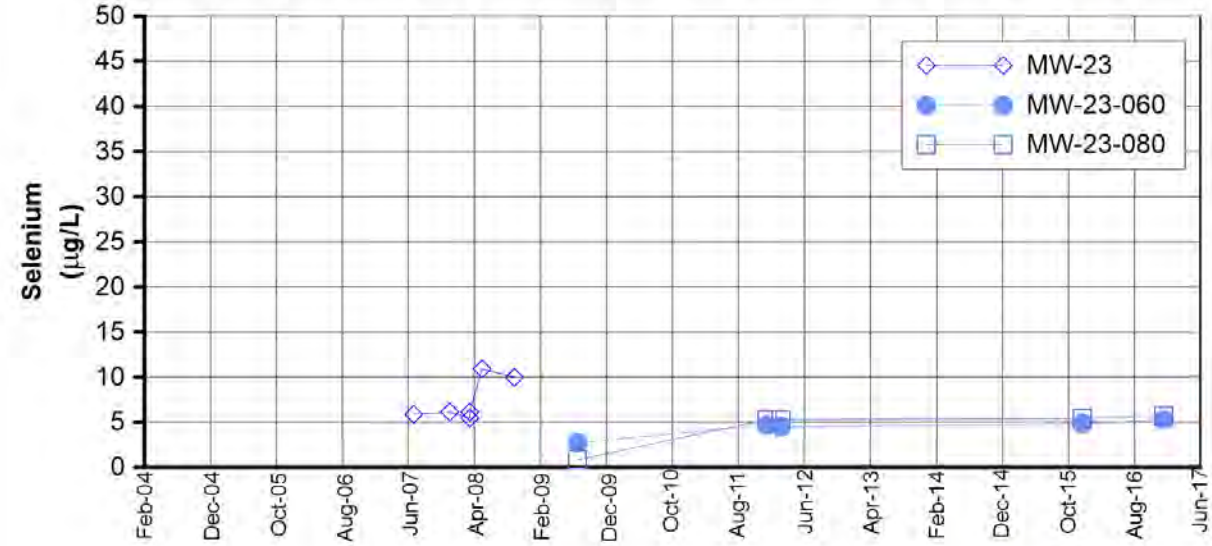
1. LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.
2. MW-16 and MW-17 are sampled biannually and were not sampled in 2016.

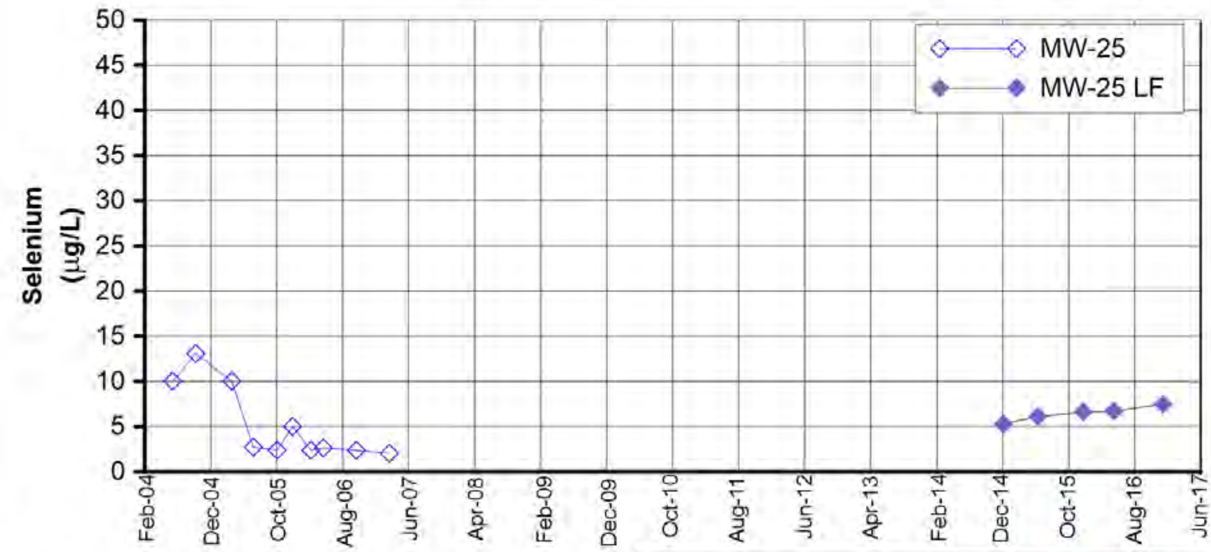
FIGURE C-58
SELENIUM
IN MW-14, MW-16, MW-17, MW-18, AND MW-19

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS







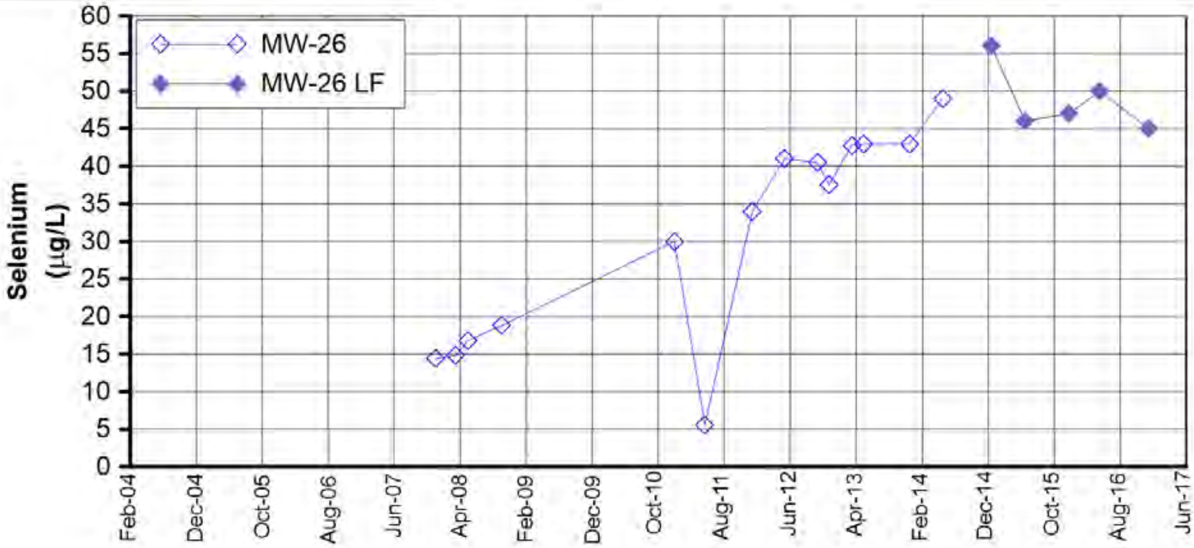
Notes:

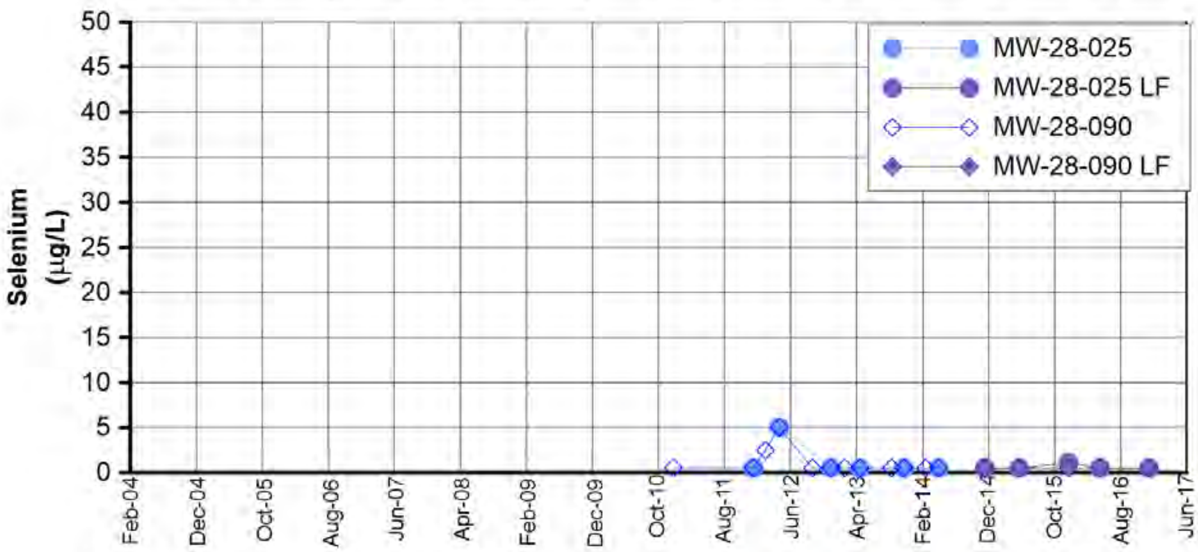
LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

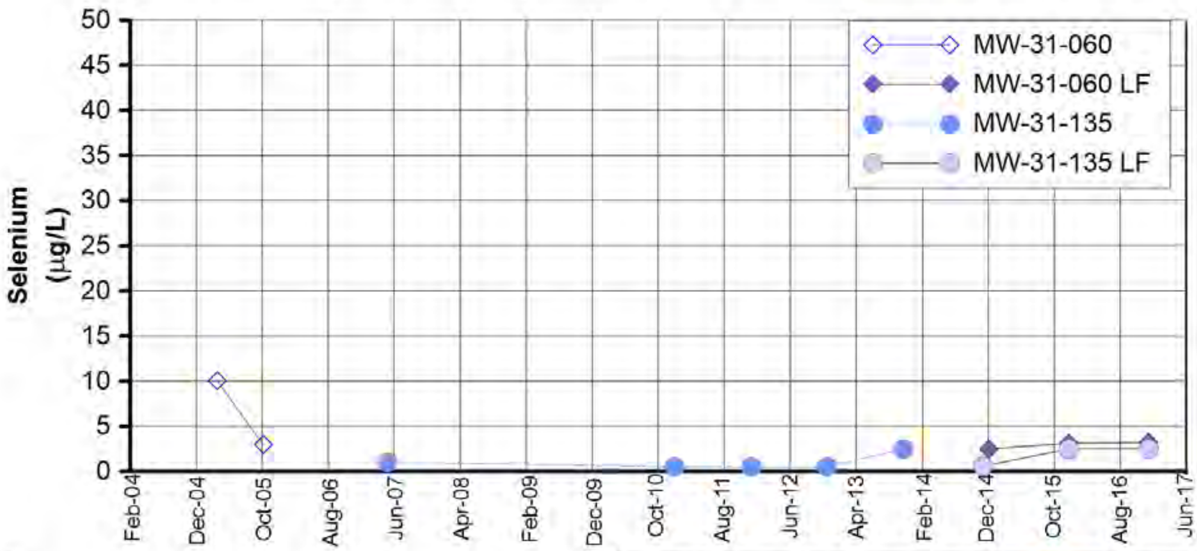
FIGURE C-59
SELENIUM
IN MW-20 AND MW-23 CLUSTERS AND MW-25

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS





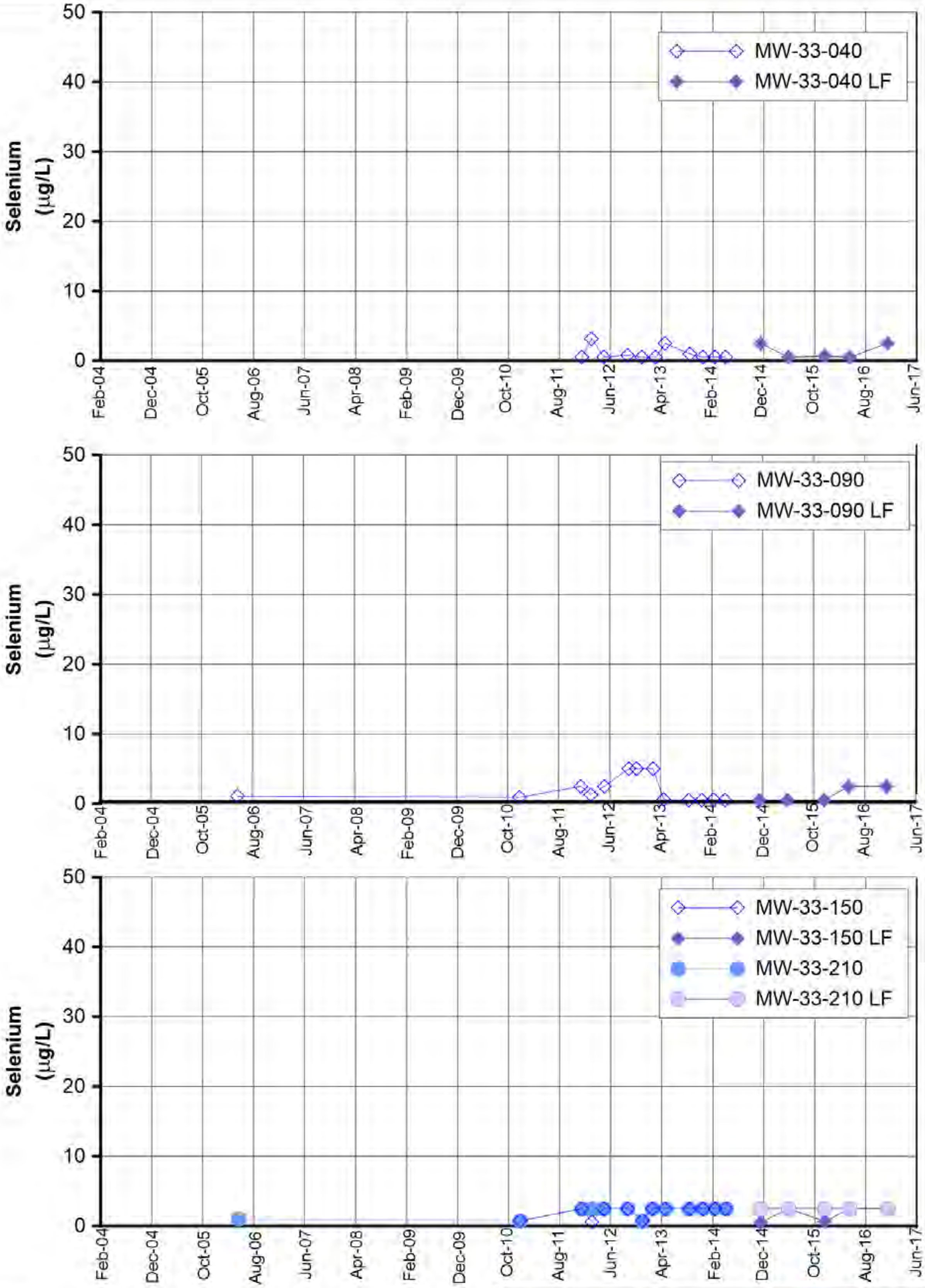


Notes:

LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

FIGURE C-60
SELENIUM
IN MW-26, MW-28, AND MW-31 CLUSTERS
FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS



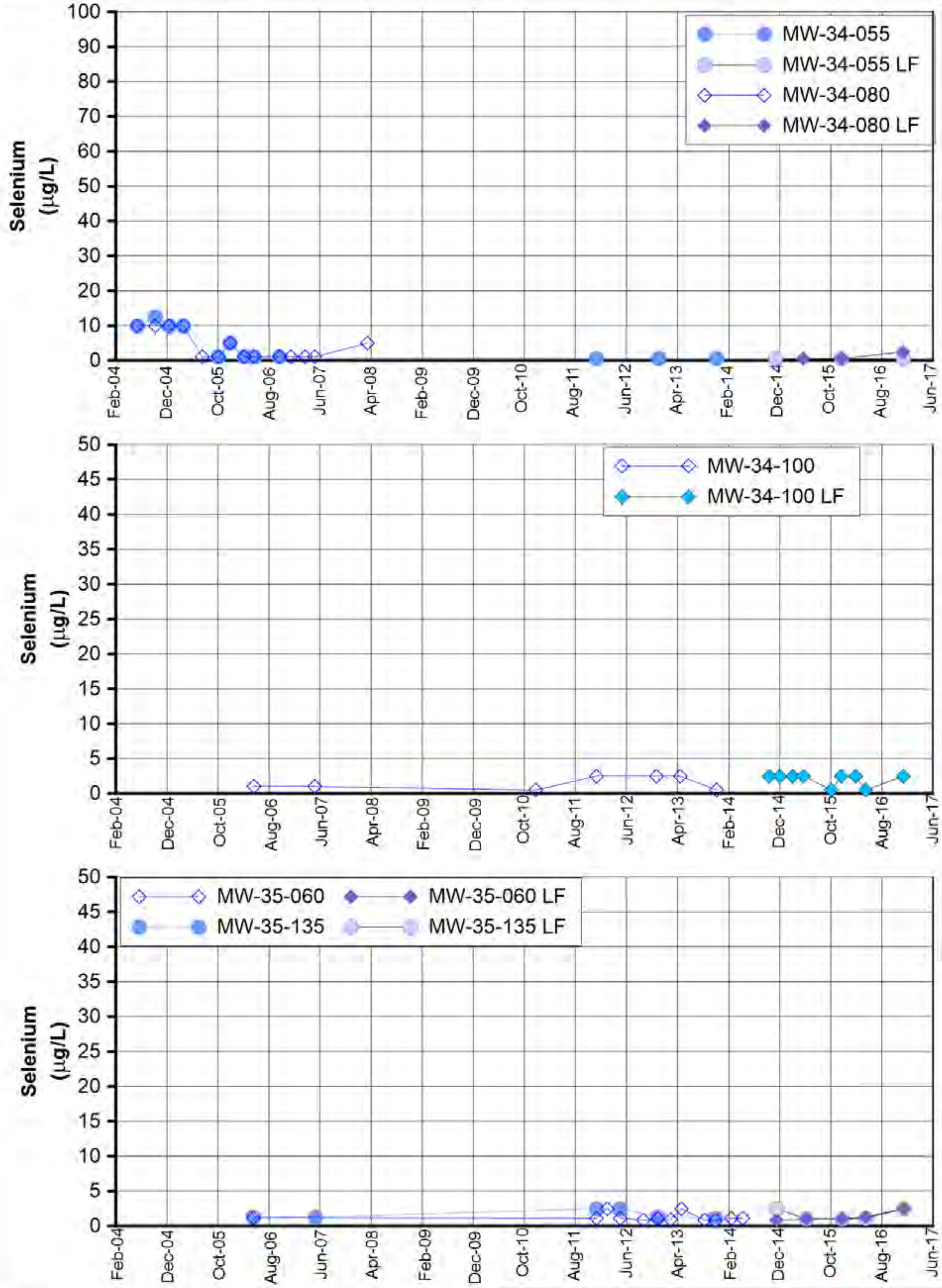
Notes:

LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

FIGURE C-61
SELENIUM
IN MW-33 CLUSTER

ARCADIS

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA



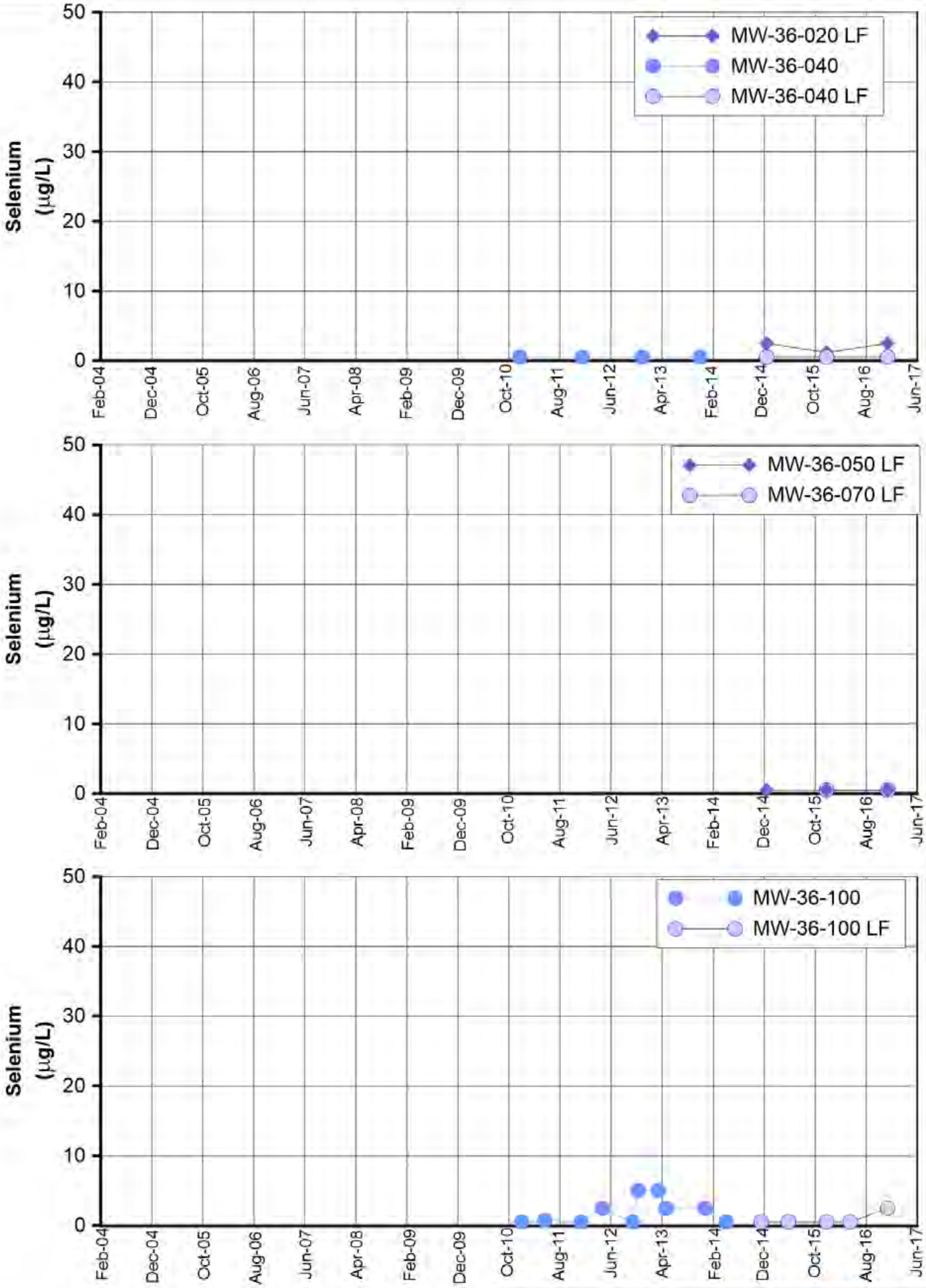
Notes:

LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

FIGURE C-62
SELENIUM
IN MW-34 AND MW-35 CLUSTERS

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS



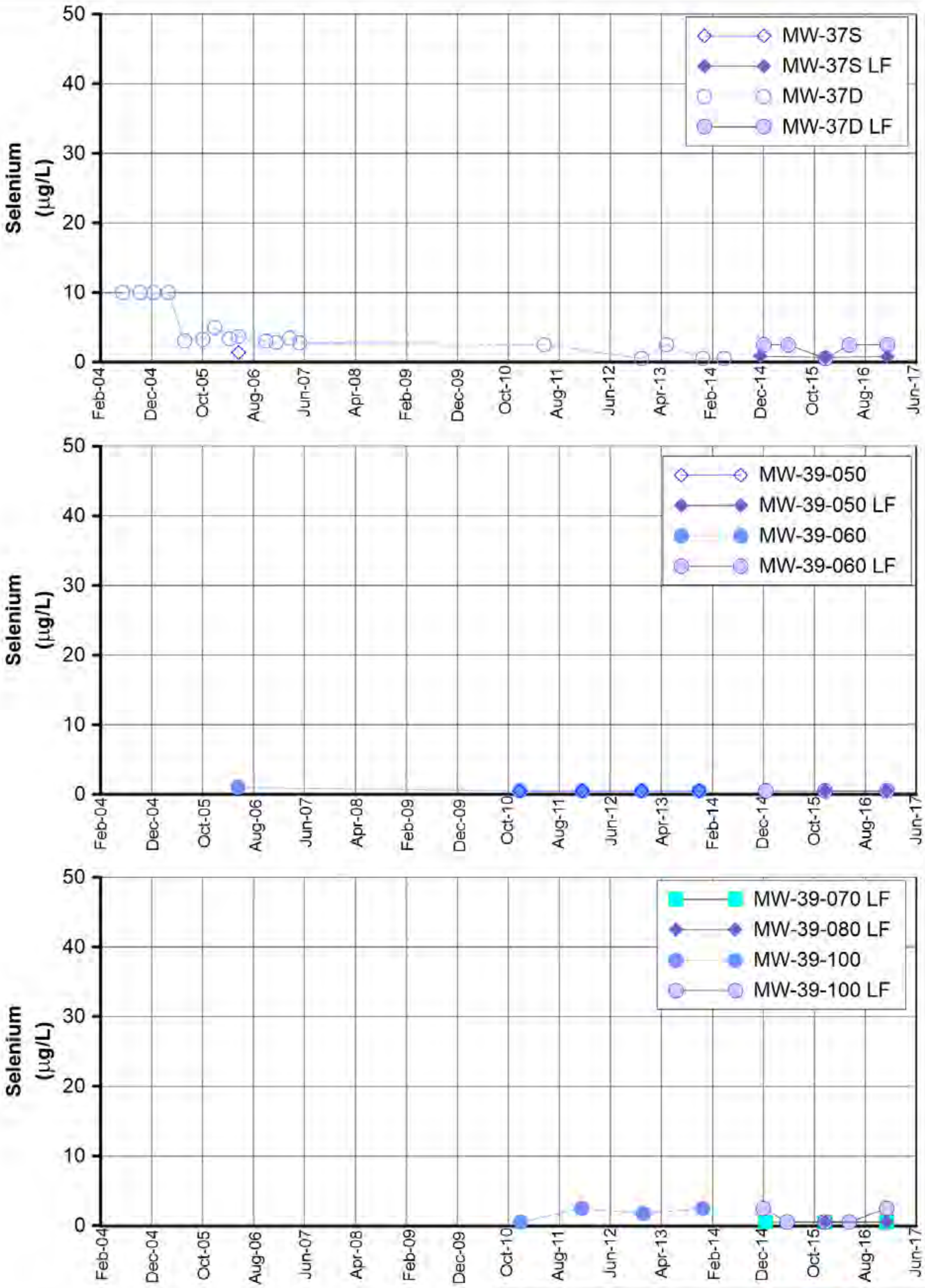
Notes:

LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

FIGURE C-63
SELENIUM
IN MW-36 CLUSTER

ARCADIS

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA



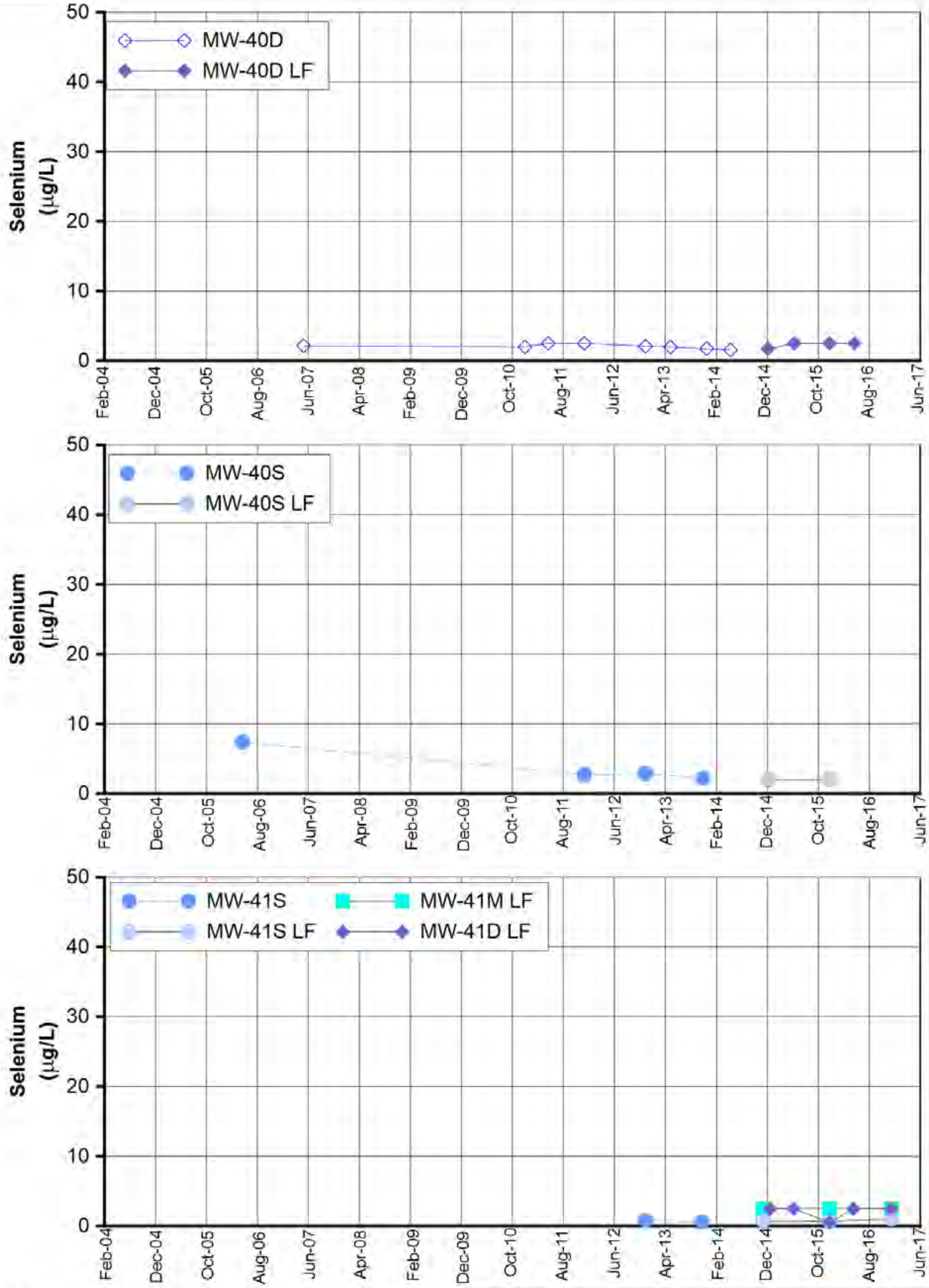
Notes:

LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

FIGURE C-64
SELENIUM
IN MW-37 AND MW-39 CLUSTERS

ARCADIS

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

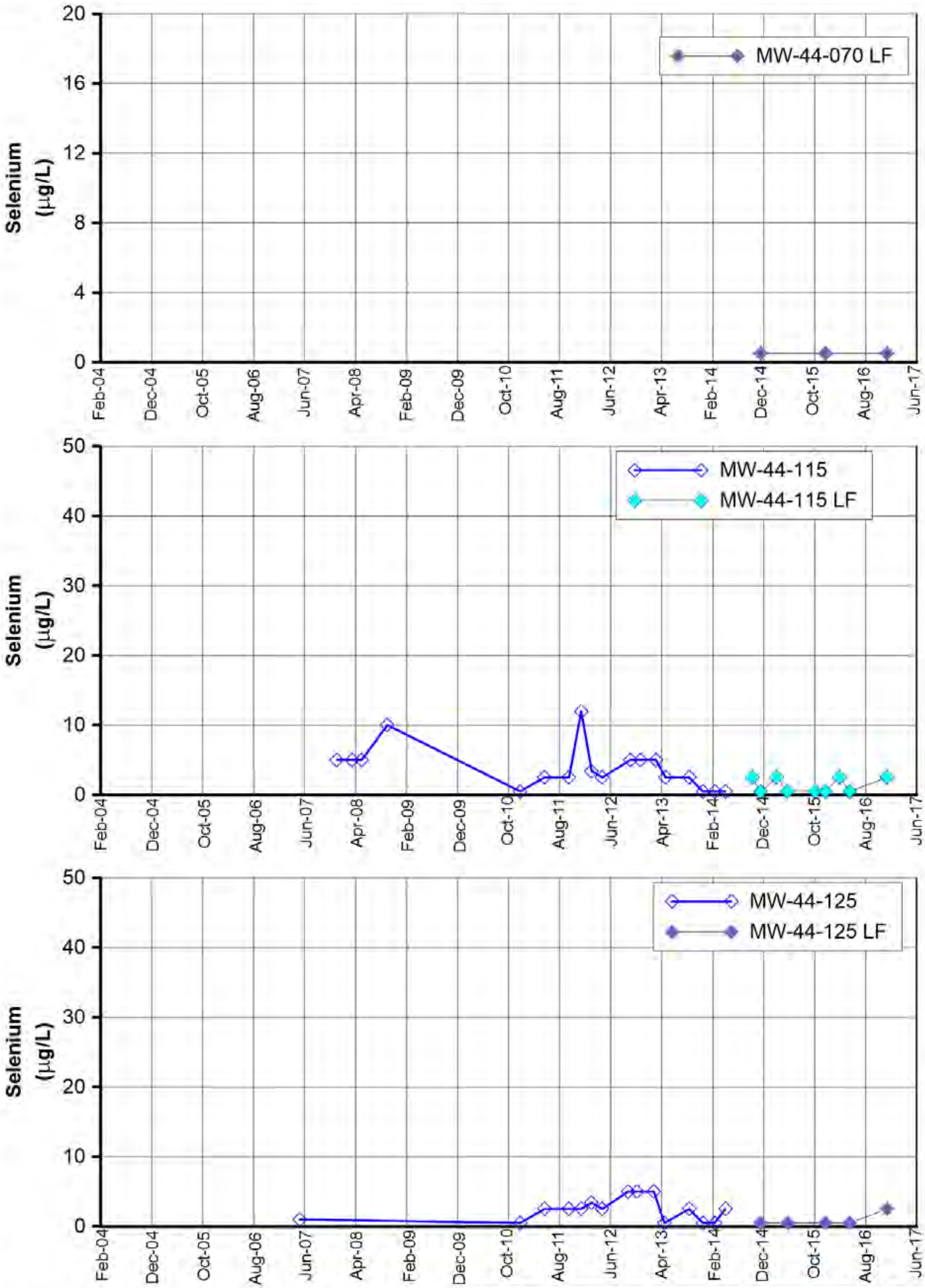


Notes:

1. LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.
2. MW-40D and MW-40S were not sampled during 4th Quarter 2016 due to traffic control issues.

FIGURE C-65
SELENIUM
IN MW-40 AND MW-41 CLUSTERS
FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS



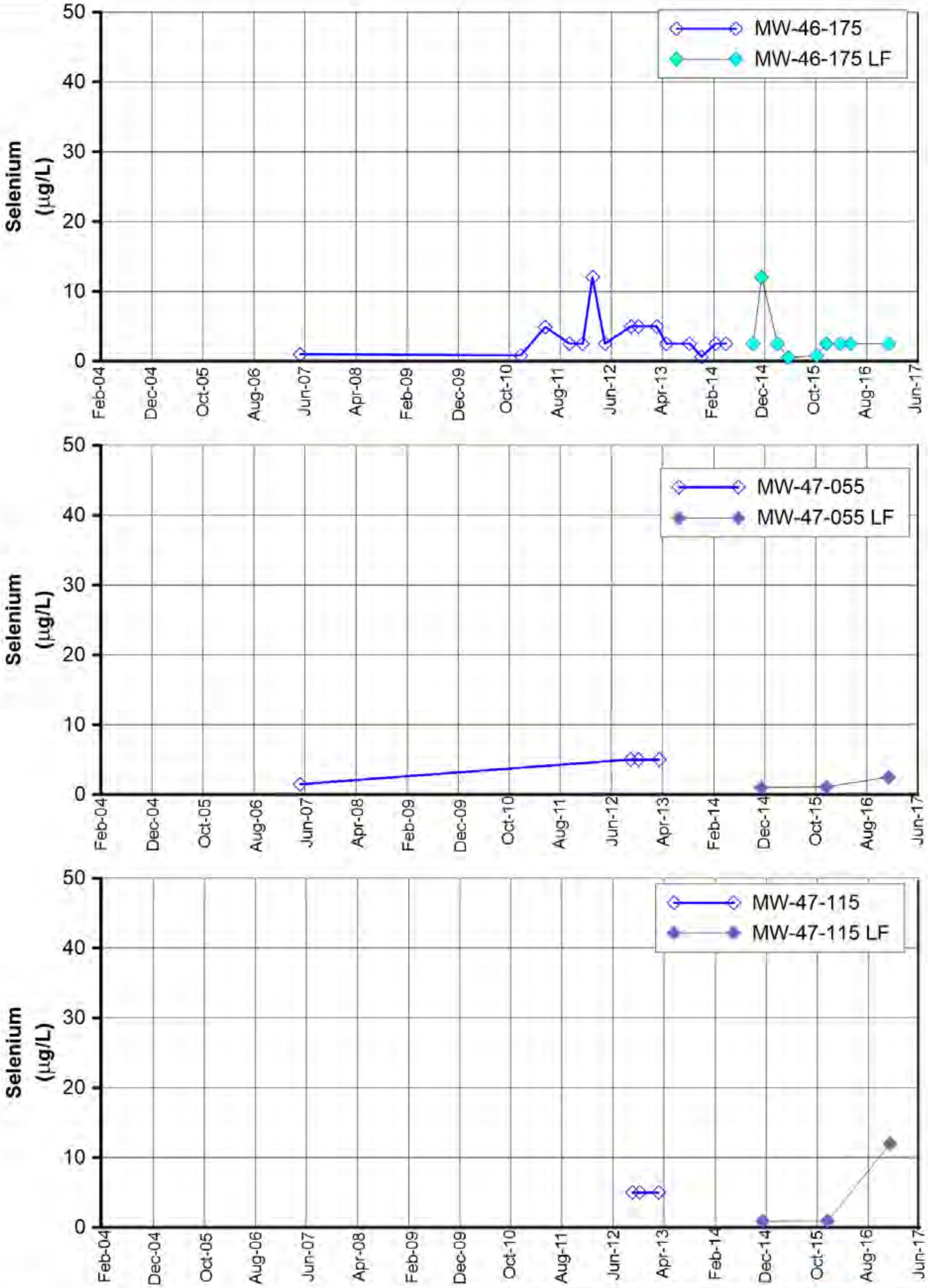
Notes:

LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

FIGURE C-66
SELENIUM
IN MW-44 CLUSTER

ARCADIS

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

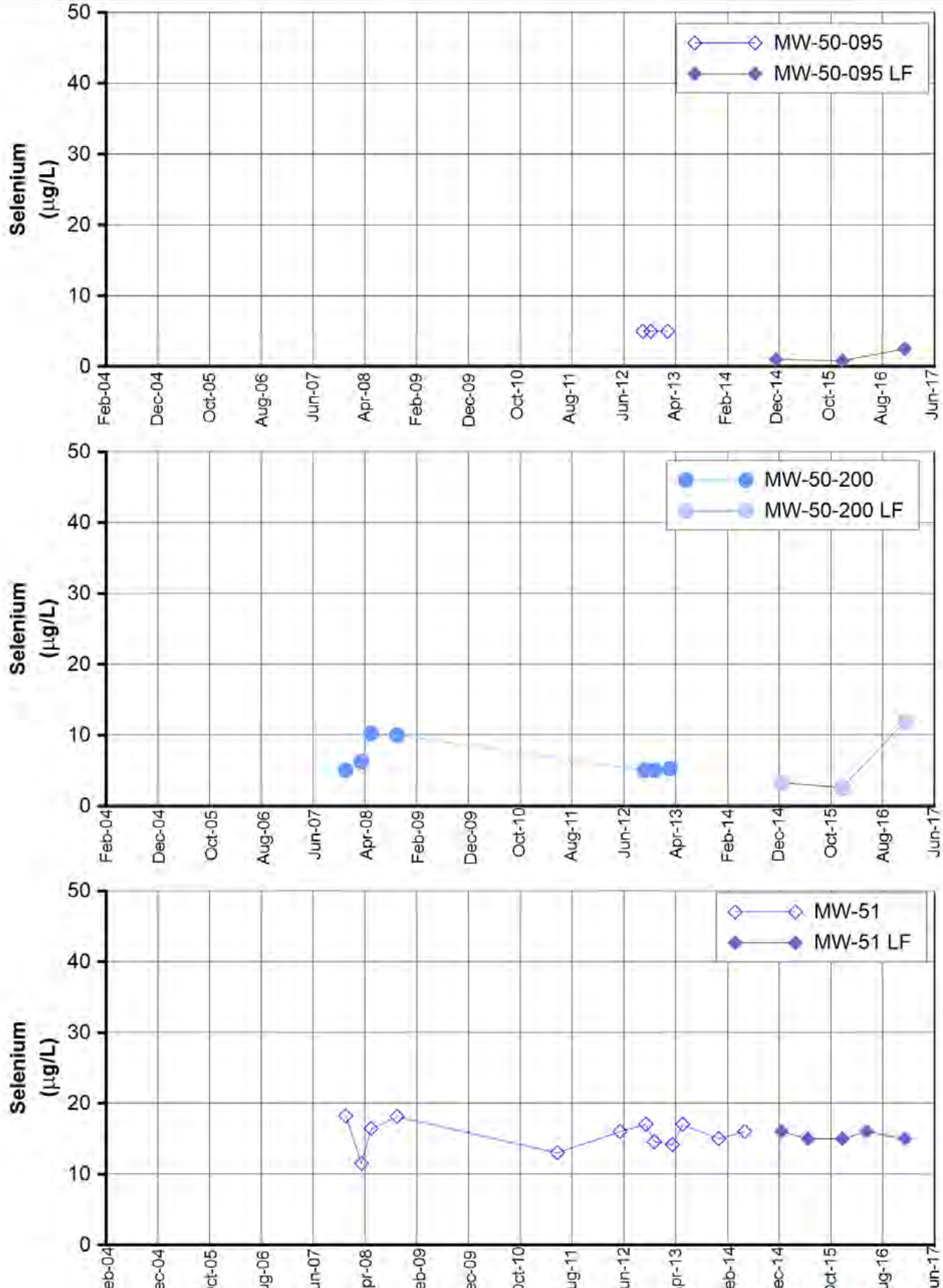


Notes:

LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

FIGURE C-67
SELENIUM
IN MW-46 AND MW-47 CLUSTERS
FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS



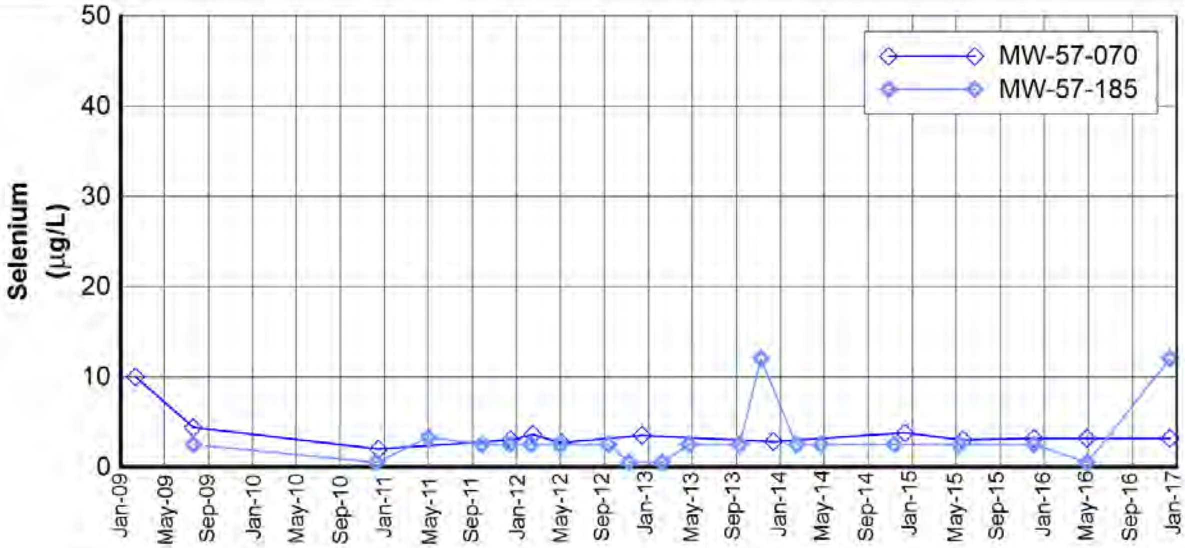
Notes:

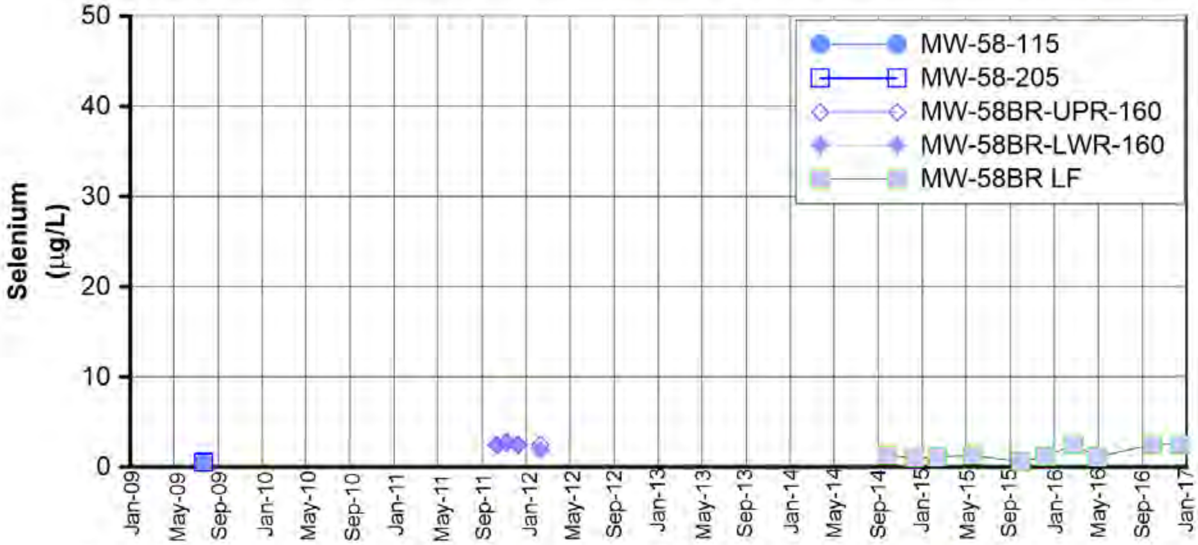
LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

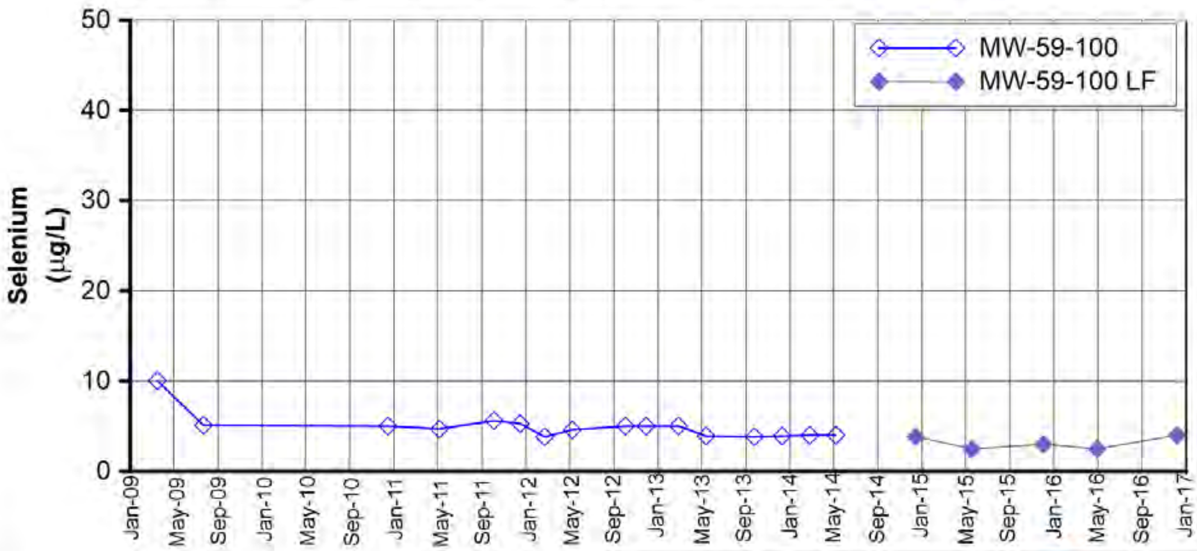
FIGURE C-68
SELENIUM
IN MW-50 AND MW-51 CLUSTERS

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS





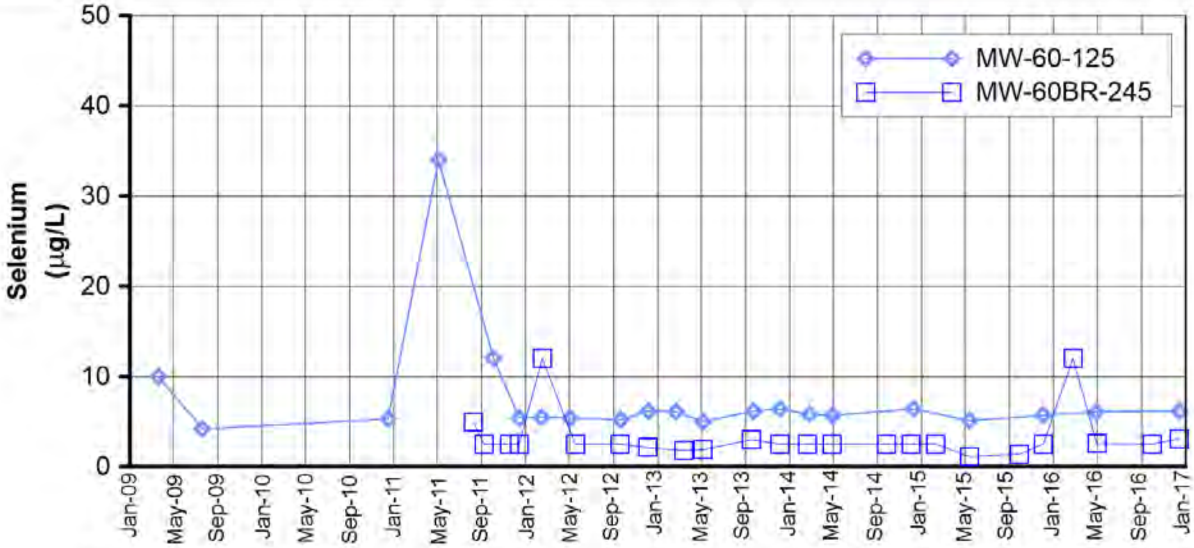


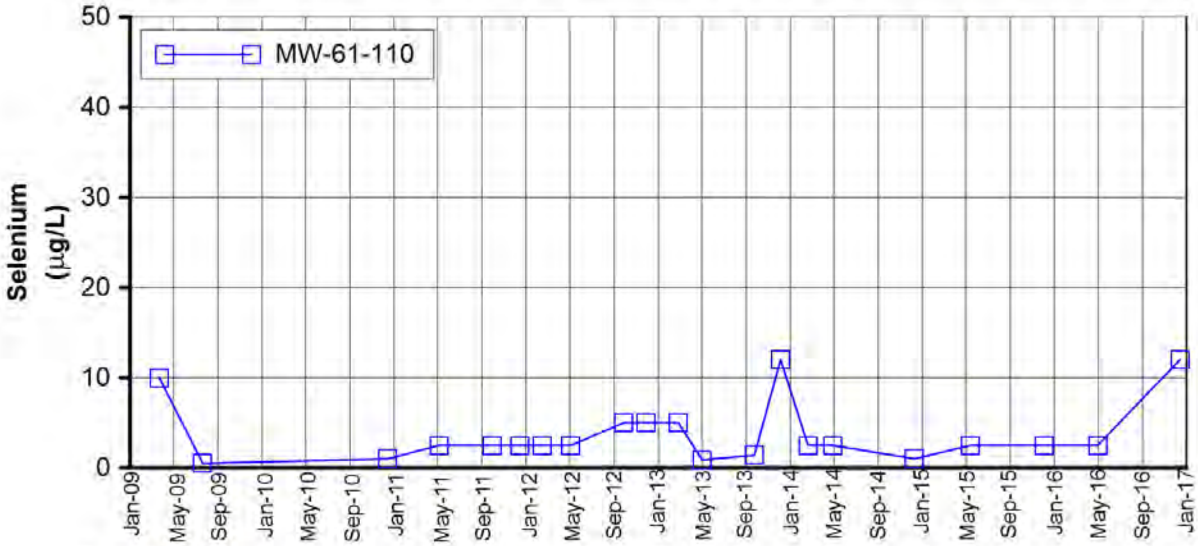
Note:

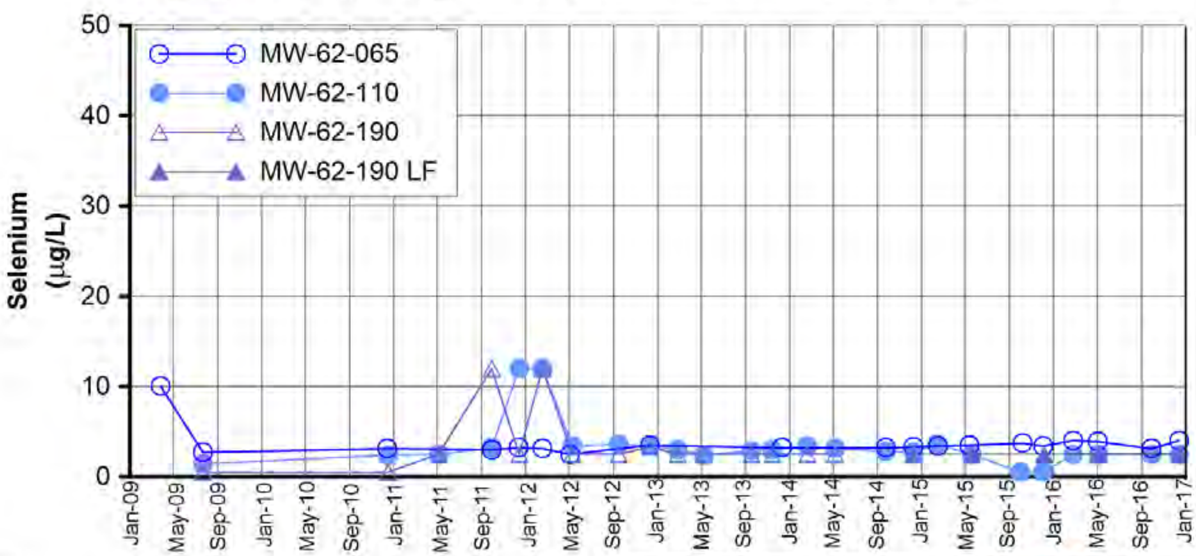
LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

FIGURE C-69
SELENIUM
IN MW-57 CLUSTER, MW-58 CLUSTER AND MW-59-100

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA







Notes:

LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

1. MW-60-125 sampled using LF method on 12/14/2016.
2. MW-62-065 sampled using LF method on 9/28/2016 & 12/13/2016.

FIGURE C-70
SELENIUM
IN MW-60 CLUSTER, MW-61-110, AND MW-62 CLUSTER

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS

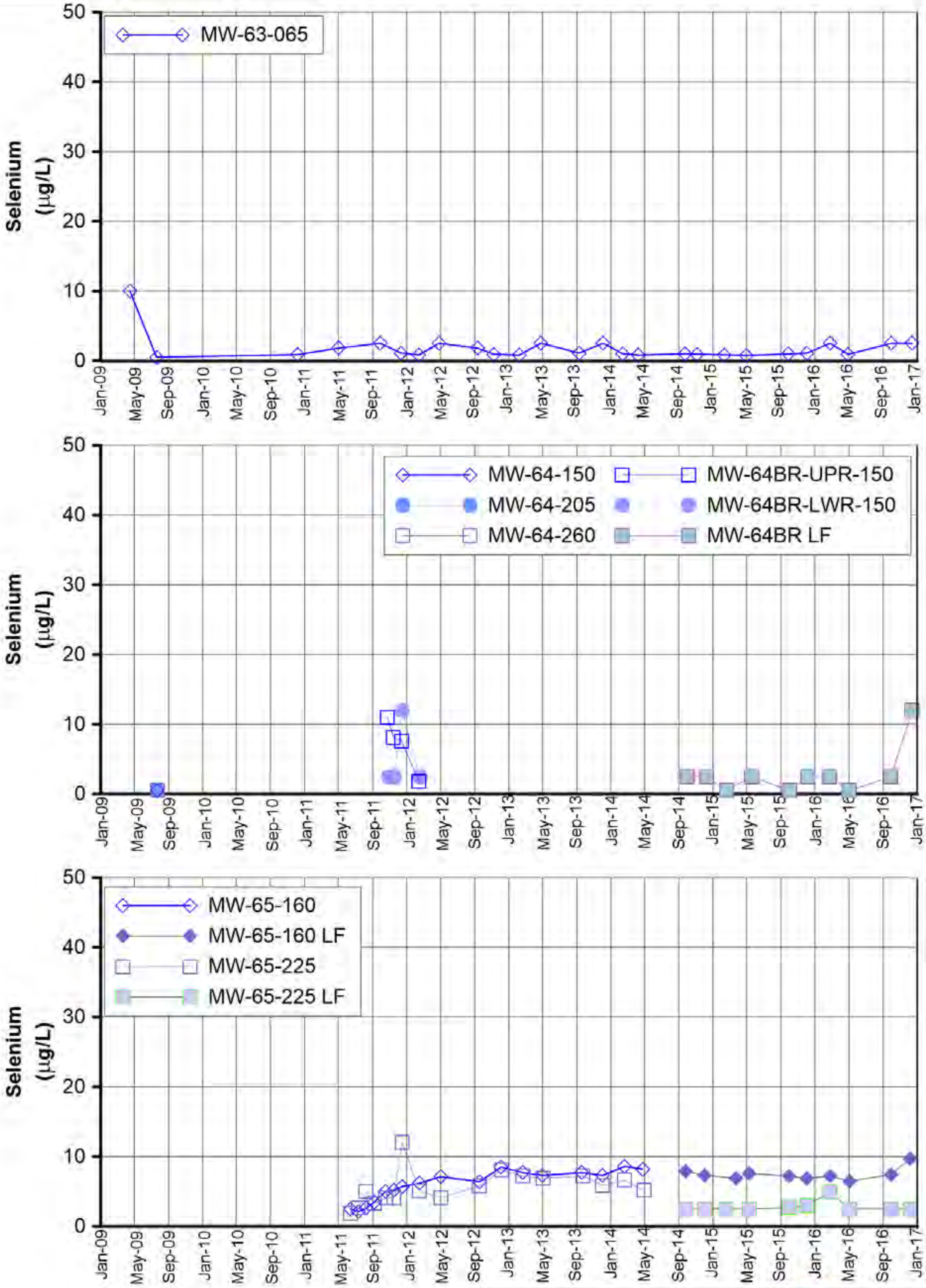
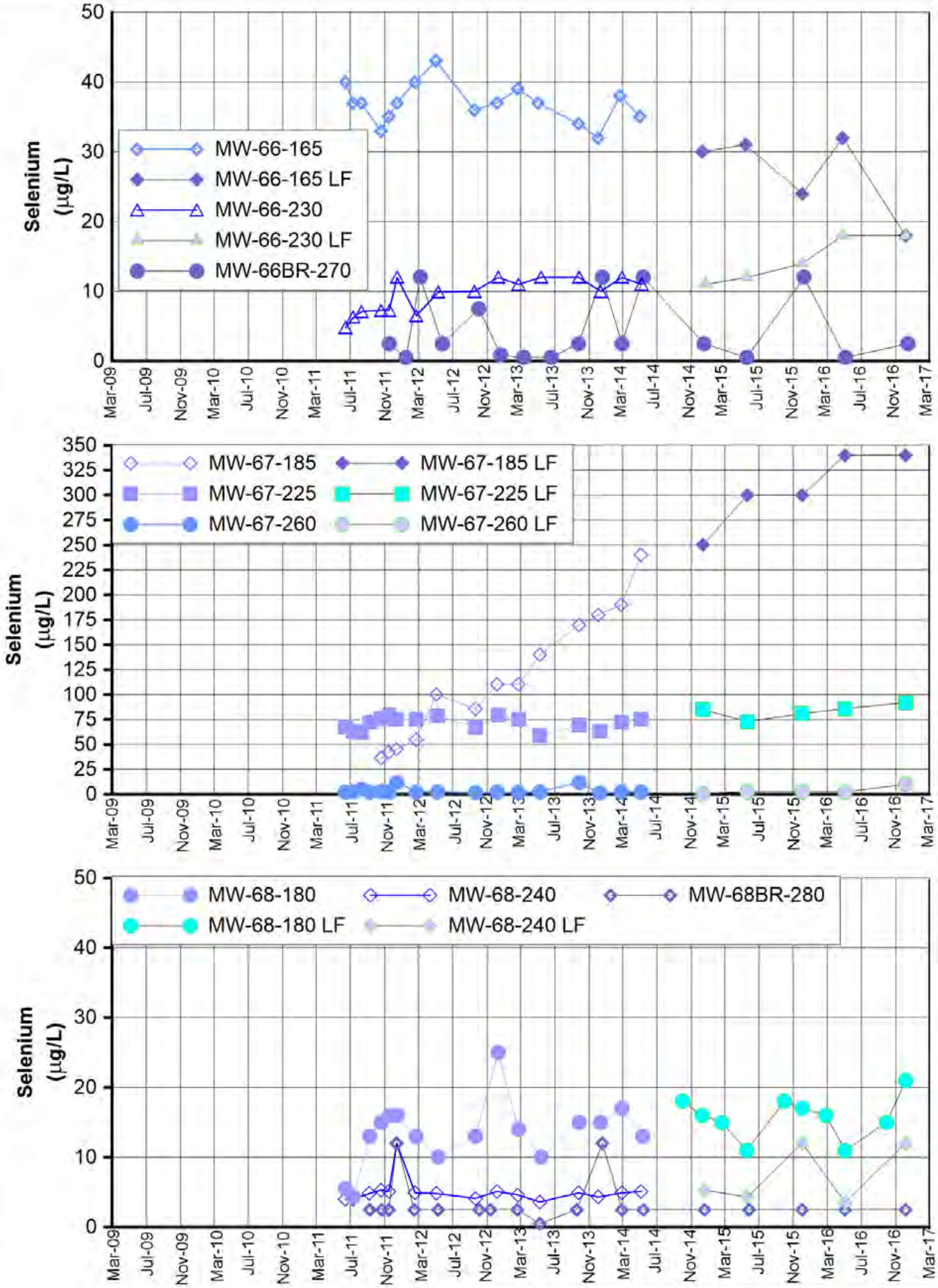


FIGURE C-71
SELENIUM
IN MW-63-065, MW-64 CLUSTER AND MW-65 CLUSTER
FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS

Notes:

LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.
1. MW-63-065 sampled using LF method on 4/28/2016 & 9/30/2016.



Notes:

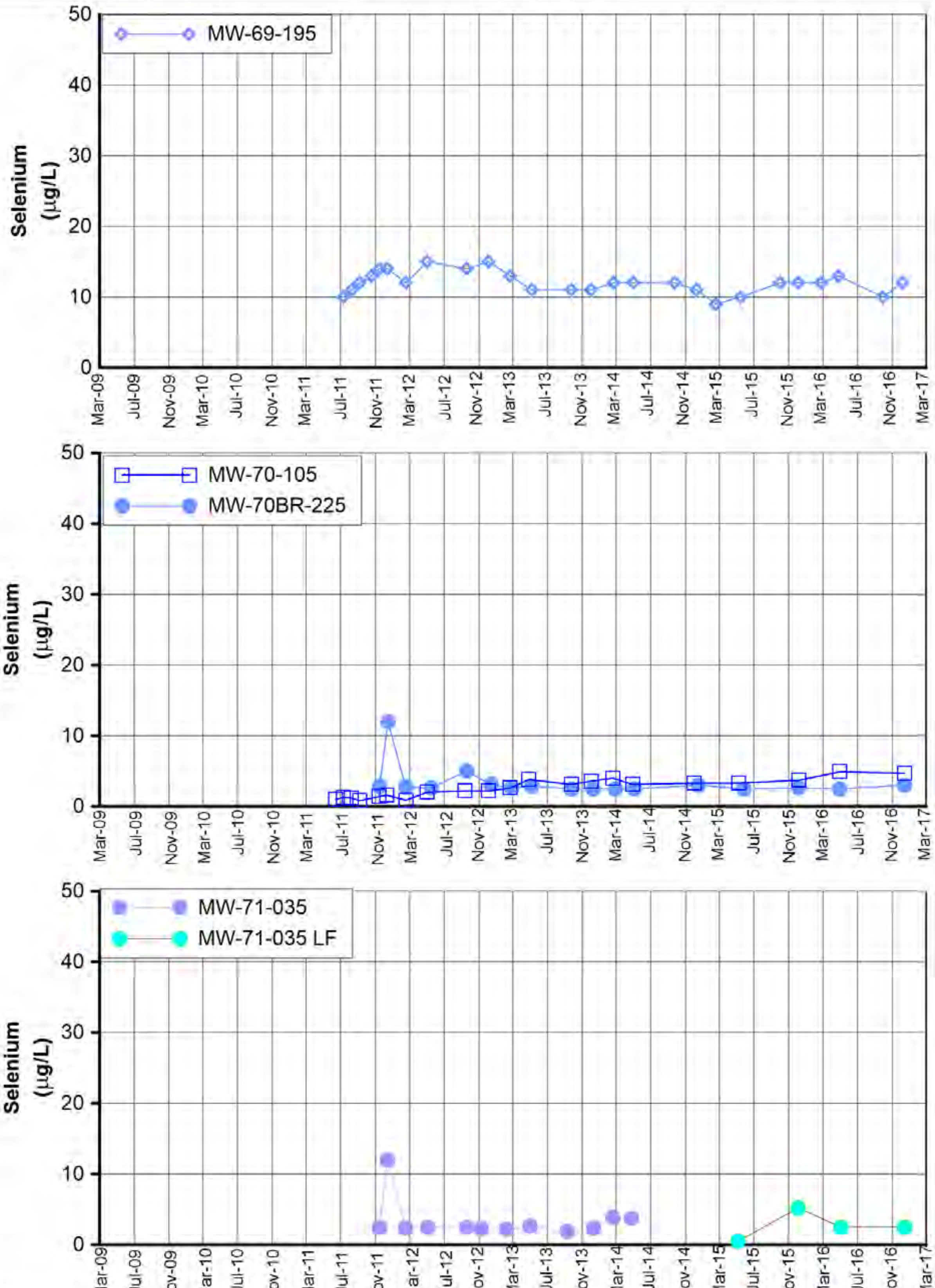
LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

1. MW-68BR-280 sampled using LF method on 5/4/2016.

FIGURE C-72
SELENIUM
IN MW-66, MW-67, AND MW-68 CLUSTERS

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS



Notes:

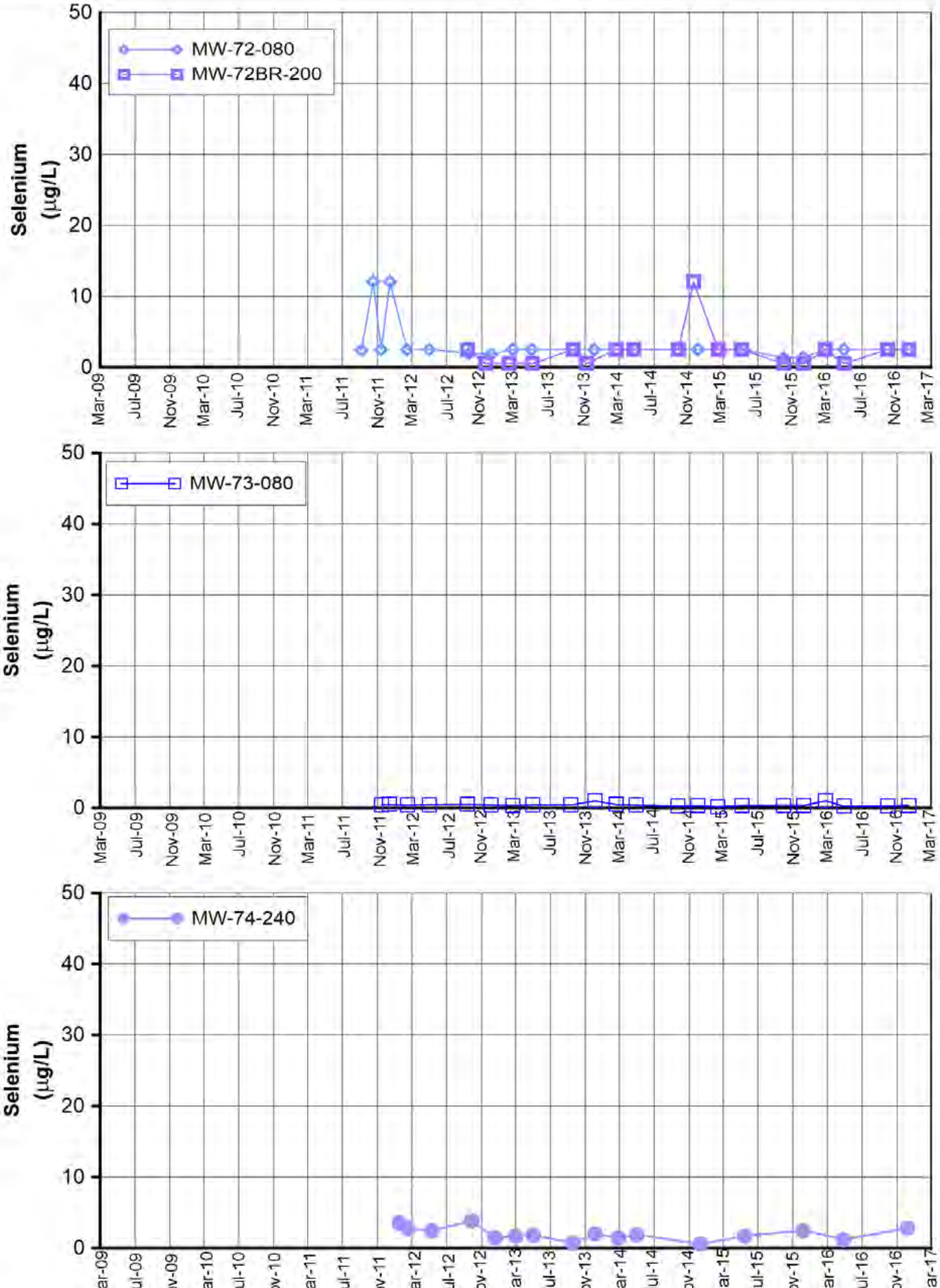
LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

1. MW-69-195 sampled using LF method on 9/29/2016 & 12/6/2016.
2. MW-70-105 sampled using LF method on 4/28/2016 & 12/14/2016.
3. MW-71-035 sampled using grab method on 12/14/2016.

FIGURE C-73
SELENIUM
IN MW-69-195, THE MW-70 CLUSTER, AND MW-71-035

ARCADIS

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA



Notes:

1. MW-72-080 sampled using low flow sampling method on 9/28/2016 and 12/12/2016.
2. MW-73-080 sampled using low flow sampling method on 12/12/2016.
3. MW-74-240 sampled using low flow sampling method on 4/27/2016 and 12/8/2016.

FIGURE C-74
SELENIUM
IN MW-72 CLUSTER, MW-73-080, AND MW-74-240
FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS

\\arcadis-us.com\officedata\Denver-CO-Technical\Aproject\PG&E - Groundwater Monitoring\Reporting\00_Arcadis_rpts\02_GMP_rpts\05_Q416

APPENDIX D

Other Groundwater Monitoring Results

Table D-1

In Situ Byproducts and Geochemical Indicator Parameter Analytical Results, Fourth Quarter 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

Location ID	Sample Date		Arsenic, Dissolved (µg/L)	Manganese, Dissolved (µg/L)	Iron, Dissolved (µg/L)	Ammonia (mg/L)	Nitrate/Nitrite as N (mg/L)	Sulfate (mg/L)	Fluoride (mg/L)	Field ORP (mV)
MW-09	12/7/2016		1.8	ND (0.5)	21	--	12	240	--	20
MW-10	12/7/2016		3	3.4	64	--	12	250	--	18
MW-11	12/7/2016	FD	1.4	ND (0.5)	59	--	5.6	190	--	--
MW-11	12/7/2016		1.5	ND (0.5)	43	--	5.6	190	--	1.9
MW-12	12/7/2016		41	1.4	ND (20)	--	16	480	--	-100
MW-13	12/8/2016		1.4	ND (0.5)	31	--	--	150	--	-89
MW-14	12/8/2016		0.91	ND (0.5)	ND (20)	--	3.3	120	--	23
MW-15	12/12/2016		--	ND (0.5)	ND (20)	--	--	130	--	100
MW-18	12/8/2016		--	ND (0.5)	ND (20)	--	--	99	--	26
MW-19	12/8/2016		0.96	ND (0.5)	ND (20)	--	--	160	--	47
MW-20-070	12/9/2016		--	ND (0.5)	ND (20)	--	8	240	--	41
MW-20-100	12/9/2016		--	ND (0.5)	ND (20)	--	8.1	250	--	60
MW-20-130	12/9/2016	FD	5.3	2.2	ND (20)	--	11	1,100	--	--
MW-20-130	12/9/2016		5.2	ND (2.5)	ND (20)	--	12	1,100	--	60
MW-21	12/14/2016		--	33	57	--	0.31	2,600	--	25
MW-22	12/6/2016		16	4,500	8,400	--	--	1,900	--	-96
MW-23-060	12/14/2016		5.7	3.7	ND (20)	--	--	670	--	76
MW-23-080	12/14/2016	FD	4.9	4.2	ND (20)	--	--	970	--	--
MW-23-080	12/14/2016		5.1	4.4	49	--	--	970	--	24
MW-24A	12/6/2016		0.13	22	--	--	ND (0.05)	--	--	-180
MW-24B	12/6/2016		1.4	85	--	--	1.1	--	--	-190
MW-24BR	12/7/2016		ND (0.5)	130	250	--	ND (0.05)	460	--	-220
MW-25	12/8/2016		1.4	ND (0.5)	ND (20)	--	9.3	180	--	47
MW-26	12/8/2016	FD	1.8	ND (0.5)	48	--	21	520	--	--
MW-26	12/8/2016		1.9	ND (0.5)	89	--	22	520	--	56
MW-27-020	12/6/2016		1.3	63	38 U	--	ND (0.05)	250	--	40
MW-27-060	12/6/2016	FD	8	210	310	--	ND (0.05)	150	--	--
MW-27-060	12/6/2016		8.3	220	290	--	ND (0.05)	150	--	-63
MW-27-085	12/6/2016		1.5	69	120	--	ND (0.05)	900	--	32
MW-28-025	12/8/2016		0.84	ND (0.5)	ND (20)	--	ND (0.05)	280	--	51
MW-28-090	12/8/2016		2.5	290	780	--	ND (0.05)	340	1.6	-46
MW-29	12/8/2016		12	390	1,900	--	ND (0.05)	470	--	-37
MW-30-030	12/6/2016		2.7	230	1,100	--	ND (0.1)	3,700	--	-140
MW-30-050	12/6/2016		2.9	200	54	--	ND (0.05)	210	--	49
MW-31-060	12/9/2016	FD	1.2	ND (0.5)	ND (20)	--	4.1	220	--	--
MW-31-060	12/9/2016		1.2	ND (0.5)	29	--	4.1	210	--	-72
MW-31-135	12/9/2016		3.9	1.8	ND (20)	--	--	490	--	-91
MW-32-020	12/6/2016		4.9	280	7,300	--	--	8,200	--	-93
MW-32-035	12/6/2016		13	840	5,200	--	ND (0.05)	1,100	--	-82
MW-33-040	12/8/2016		11	ND (0.5)	ND (20)	--	0.47	1,700	12	32
MW-33-090	12/8/2016		1.2	3.3	290	--	1.1	720	0.32	22
MW-33-150	12/8/2016		1.8	ND (2.5)	ND (20)	--	1.4	770	2.2	57
MW-33-210	12/8/2016		1.2	5.6	32	--	1.8	1,100	1.6	55
MW-34-055	12/6/2016		2.4	86	43	--	ND (0.05)	230	--	21
MW-34-080	12/6/2016	FD	1.3	33	97	--	--	620	--	--
MW-34-080	12/6/2016		1.3	33	100	--	--	630	--	-4.4
MW-34-100	12/6/2016		1.2	36	44	--	0.078	1,200	--	-53
MW-35-060	12/9/2016		1.1	ND (0.5)	ND (20)	--	2	350	--	46
MW-35-135	12/9/2016	FD	0.91	0.6	ND (20)	--	2.6	750	--	--
MW-35-135	12/9/2016		0.95	0.62	ND (20)	--	2.5	750	--	48
MW-36-020	12/7/2016		1.9	390	2,000	--	--	2,300	--	-99
MW-36-040	12/7/2016		5.6	110	400	--	ND (0.05)	180	--	-150
MW-36-050	12/7/2016		4.4	250	130	--	--	190	--	-52
MW-36-070	12/7/2016		3.2	240	ND (20)	--	--	200	--	66
MW-36-090	12/7/2016		18	25	ND (20)	--	--	210	--	-4.1
MW-36-100	12/7/2016		6.6	110	67	--	0.06	590	--	-40
MW-37D	12/8/2016		4.4	4.8	ND (20)	--	0.16	660	--	-71
MW-37S	12/8/2016		1.9	2.1	66	--	--	310	--	-98
MW-38D	12/7/2016		8.2	48	59 J	--	0.09	740	--	-71
MW-38S	12/7/2016	FD	9.9	140	23	--	1.4	160	--	--
MW-38S	12/7/2016		9.9	130	55	--	1.4	160	--	-87
MW-39-040	12/7/2016		19	150	--	--	--	--	--	-150

Table D-1

In Situ Byproducts and Geochemical Indicator Parameter Analytical Results, Fourth Quarter 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

Location ID	Sample Date		Arsenic, Dissolved (µg/L)	Manganese, Dissolved (µg/L)	Iron, Dissolved (µg/L)	Ammonia (mg/L)	Nitrate/Nitrite as N (mg/L)	Sulfate (mg/L)	Fluoride (mg/L)	Field ORP (mV)
MW-39-050	12/7/2016		2.3	140	35	--	--	210	--	12
MW-39-060	12/7/2016		4.7	58	40	--	ND (0.05)	210	--	23
MW-39-070	12/7/2016		--	1.1	51	--	--	250	--	77
MW-39-080	12/7/2016		--	2.9	22	--	--	270	--	33
MW-39-100	12/7/2016		2.3	9.1	ND (20)	--	ND (0.05)	1,300	--	87
MW-41D	12/8/2016		2.9	65	37	--	0.46	780	--	-130
MW-41M	12/8/2016		2.2	1.6	ND (20)	--	0.67	560	--	-120
MW-41S	12/8/2016		1.7	0.57	ND (20)	--	1.5	310	--	-120
MW-42-030	12/6/2016		--	36	--	--	ND (0.05)	--	--	-110
MW-42-055	12/6/2016		29	22	76	--	--	190	--	26
MW-42-065	12/6/2016	FD	5.5	590	41	--	--	380	--	--
MW-42-065	12/6/2016		5.4	580	39	--	--	380	--	52
MW-43-025	12/7/2016		25	290	3,200	--	--	290	--	-71
MW-43-075	12/9/2016		13	930	4,600	--	--	950	--	-110
MW-43-090	12/9/2016		2.2	430	920	--	--	1,000	--	22
MW-44-070	12/7/2016		5.3	94	63 U	--	--	230	--	-39
MW-44-115	12/7/2016		6.6	4.3	ND (20)	--	0.15	850	--	25
MW-44-125	12/7/2016	FD	5	320	78 U	--	0.095	580	--	--
MW-44-125	12/7/2016		5.1	310	69 U	--	0.066	580	--	-45
MW-46-175	12/8/2016		--	19	ND (20)	--	1.1	860	--	-11
MW-46-205	12/8/2016		--	42	ND (20)	--	--	880	--	31
MW-47-055	12/8/2016		1.3	ND (0.5)	21	--	--	280	--	25
MW-47-115	12/8/2016		--	ND (2.5)	48	--	--	780	--	52
MW-48	12/14/2016		--	14	ND (20)	--	--	580	--	48
MW-49-135	12/8/2016	FD	2	270	ND (20)	--	--	790	--	--
MW-49-135	12/8/2016		2.2	270	ND (20)	--	--	820	--	-54
MW-49-275	12/8/2016		2.8	380	27	--	--	1,400	--	2.0
MW-49-365	12/8/2016		3.6	280	310	--	--	1,200	--	-100
MW-50-095	12/9/2016		--	3.1	ND (20)	--	--	290	--	-98
MW-50-200	12/9/2016		--	2.8	ND (20)	--	--	970	--	-93
MW-51	12/9/2016		4	1.7	ND (20)	--	9.5	350	--	62
MW-52D	12/5/2016		2.5	310	5,400	--	--	940	--	-90
MW-52M	12/5/2016		0.74	220	720	--	--	660	--	-120
MW-52S	12/5/2016	FD	0.23	1,400	11,000 J	--	--	1,000	--	--
MW-52S	12/5/2016		0.34	1,300	1,700 J	--	--	1,100	--	-87
MW-53D	12/5/2016		0.68	320	270	--	--	1,200	--	-82
MW-53M	12/5/2016		0.47	260	390	--	--	380	--	-150
MW-54-085	12/15/2016		3.16	731	ND (10)	--	--	570	--	-110
MW-54-140	12/15/2016		2.98	84.7	ND (10)	--	--	492	--	-120
MW-54-195	12/15/2016	FD	1.35	310	114	--	--	927 U	--	--
MW-54-195	12/15/2016		1.17	316	114	--	--	933	--	-97
MW-55-045	12/15/2016		--	831	49.1	--	--	97.4 U	--	-14
MW-55-120	12/15/2016		--	ND (0.2)	ND (10)	--	--	263	--	-110
MW-56D	12/14/2016		--	748	821	--	--	1,340	--	-34
MW-56M	12/14/2016		--	717	2,890	--	--	889	--	-110
MW-56S	12/14/2016		--	1,030	9,010	--	--	1,240	--	-110
MW-57-070	12/13/2016		1.5	ND (0.5)	ND (20)	--	7.7	88	--	85
MW-57-185	12/13/2016		17	290	ND (20)	--	ND (0.05)	750	--	32
MW-58BR	12/13/2016		1.6	390	ND (20)	--	0.34	520	--	66
MW-59-100	12/7/2016	FD	2.2	8.4	100	--	3.5	610	--	--
MW-59-100	12/7/2016		2.3	10	210	--	3.4	610	--	77
MW-60-125	12/14/2016		1.5	4.9	34	--	4.1	470	--	84
MW-60BR-245	12/14/2016		7.1	15	83	--	0.15	800	--	-65
MW-61-110	12/13/2016		3.4	150	23	--	0.9	730	--	-67
MW-62-065	12/13/2016		1.4	1.1	ND (20)	--	4.6	430	--	-70
MW-62-110	12/14/2016		13	120	27	--	0.092	550	--	20
MW-62-190	12/14/2016		3.8	1,200	51	--	ND (0.05)	730	--	-210
MW-63-065	12/13/2016		1.6	5.2	ND (20)	--	0.98	590	--	-65
MW-64BR	12/13/2016	FD	4.7	1,000	260	--	ND (0.05)	600	--	--
MW-64BR	12/13/2016		4.2	1,000	260	--	ND (0.05)	610	--	-84
MW-65-160	12/6/2016		0.8	15	130 J	--	12	420	--	41
MW-65-225	12/6/2016		3	43	44	--	2.1	890	--	-37

Table D-1

In Situ Byproducts and Geochemical Indicator Parameter Analytical Results, Fourth Quarter 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

Location ID	Sample Date		Arsenic, Dissolved (µg/L)	Manganese, Dissolved (µg/L)	Iron, Dissolved (µg/L)	Ammonia (mg/L)	Nitrate/Nitrite as N (mg/L)	Sulfate (mg/L)	Fluoride (mg/L)	Field ORP (mV)
MW-66-165	12/5/2016		0.96	ND (0.5)	ND (20)	--	23	450	--	61
MW-66-230	12/5/2016		4.7	5.4	ND (20)	--	25	1,200	--	51
MW-66BR-270	12/15/2016		0.15	93	20	--	0.1	68	--	--
MW-67-185	12/5/2016		0.96	ND (0.5)	ND (20)	--	77	510	--	-26
MW-67-225	12/5/2016		3.6	8.3	ND (20)	--	24	1,100	--	-86
MW-67-260	12/5/2016	FD	20 J	230 J	ND (20)	--	0.69	800	--	--
MW-67-260	12/5/2016		9 J	140 J	ND (20)	--	0.74	800	--	-180
MW-68-180	12/6/2016		3	ND (0.5)	ND (20)	--	32	1,200	--	-55
MW-68-240	12/6/2016		1.8	35	33	--	4.7	920	--	-99
MW-68BR-280	12/6/2016		1.2	130	44	--	ND (0.05)	710	--	-210
MW-69-195	12/6/2016		2.7	1.1	ND (20)	--	16	630	--	2.2
MW-70-105	12/14/2016		4.1	13	53	--	4.5	260	--	-85
MW-70BR-225	12/14/2016	FD	2.1	2.3	27	--	3.8	810	--	--
MW-70BR-225	12/14/2016		2	4	93	--	3.8	800	--	-57
MW-71-035	12/14/2016		4.2	3,100	680	--	ND (0.05)	1,000	--	50
MW-72-080	12/12/2016		12	72	ND (20)	--	0.86	740	--	-94
MW-72BR-200	12/12/2016		17	26	ND (20)	--	0.1	640	--	-120
MW-73-080	12/12/2016	FD	1.7	89 J	49	--	2.7	420	--	--
MW-73-080	12/12/2016		1.6	48 J	35	--	2.8	420	--	-80
MW-74-240	12/8/2016		9.6	3.9	58	--	2.6	75	--	150
OW-03D	12/8/2016		--	1.7	ND (20)	--	--	440	--	28
OW-03M	12/8/2016		--	1.5	ND (20)	--	--	330	--	22
OW-03S	12/8/2016		--	ND (0.5)	ND (20)	--	--	79	--	28
PE-01	11/2/2016		--	97	ND (20)	--	ND (0.05)	380	--	--
PE-01	12/6/2016		--	100	ND (100)	--	0.061	380	--	7.3
PGE-07BR	12/7/2016		--	5,600	64,000	--	--	460	--	-280
PGE-08	12/7/2016		--	580	180	--	ND (0.05)	1,900	--	-190
PM-03	12/9/2016		--	ND (0.5)	ND (20)	--	--	67	--	46
PM-04	12/9/2016	FD	--	9.2	210	--	--	88	--	--
PM-04	12/9/2016		--	8.8	210	--	--	88	--	42
TW-02D	12/13/2016		--	130	53	--	--	440	--	120
TW-02S	12/13/2016		--	36	ND (20)	--	1.3	330	--	130
TW-03D	11/2/2016	FD	--	10	ND (20)	--	2.9	520	--	--
TW-03D	11/2/2016		--	10	ND (20)	--	3.2	510	--	--
TW-03D	12/6/2016		--	10	ND (20)	--	3.3	520	--	16

Notes:
--- = data were not collected, was not available, were rejected or there was a field instrument malfunction.
FD = field duplicate sample.
J = concentration or RL estimated by laboratory or data validation.
mg/L = milligrams per liter.
mV = millivolts.
ND = not detected at listed reporting limit (RL).
ORP = oxidation-reduction potential.
µg/L = micrograms per liter.

ORP is reported to two significant figures.

Starting in Fourth Quarter 2012, nitrate samples were analyzed using USEPA Method 353.2, except for TW-3D and PE-1, which were still analyzed using USEPA Method 300.0. USEPA Method 353.2 reports a combination of nitrate and nitrite as nitrogen. The contribution of nitrite to the reported result of nitrate plus nitrite as nitrogen is expected to be negligible; therefore, sample results for USEPA Method 353.2 are expected to be essentially the same as previous samples analyzed using USEPA Method 300.0 and reported as nitrate as nitrogen.

Fourth Quarter 2014 data was collected January 2015 due to field logistical issues.

Table D-2

Manual Water Level Measurements, January 2016 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California

Location ID	Well Depth (feet BMP)	Measuring Point Elevation (feet amsl)	Monitoring Date	Water Level Measurement (feet BMP)	Salinity (percent)	Groundwater Elevation Adjusted for Salinity (feet amsl)
I-3	--	460.30	1/6/2016	6.08	--	454.00
I-3	--	460.30	2/2/2016	5.45	--	454.00
MW-10	97	530.65	2/4/2016	75.68	0.20	454.00
MW-11	86	522.61	2/4/2016	67.48	0.16	455.00
MW-12	50	484.01	1/6/2016	29.35	0.45	454.00
MW-12	50	484.01	2/4/2016	29.52	0.45	454.00
MW-20-070	70	500.15	1/4/2016	47.36	0.14	452.00
MW-20-070	70	500.15	2/1/2016	47.12	0.14	452.00
MW-20-100	101	500.58	1/4/2016	48.23	0.19	452.00
MW-20-100	101	500.58	2/1/2016	48.87	0.19	451.00
MW-20-130	132	500.66	1/4/2016	49.07	0.76	451.00
MW-20-130	132	500.66	2/1/2016	48.11	0.76	452.00
MW-21	58	505.55	1/6/2016	51.01	0.69	454.00
MW-21	58	505.55	2/2/2016	51.13	0.69	454.00
MW-22	12	460.72	1/6/2016	6.82	1.81	453.00
MW-22	12	460.72	2/3/2016	6.71	1.81	454.00
MW-23-060	60	504.08	1/5/2016	49.68	1.09	454.00
MW-23-060	60	504.08	2/2/2016	49.87	1.09	454.00
MW-23-080	81	504.13	1/5/2016	49.82	1.11	454.00
MW-23-080	81	504.13	2/2/2016	49.92	1.11	454.00
MW-25	107	542.90	2/1/2016	88.39	0.11	454.00
MW-26	70	502.22	1/6/2016	47.94	0.27	454.00
MW-26	70	502.22	2/2/2016	48.06	0.27	454.00
MW-27-020	14	460.56	1/5/2016	6.70	0.07	453.00
MW-27-020	14	460.56	2/2/2016	6.09	0.07	454.00
MW-27-060	59	461.38	1/5/2016	7.60	0.07	453.00
MW-27-060	59	461.38	2/2/2016	7.05	0.07	454.00
MW-27-085	80	460.99	1/5/2016	7.48	0.62	453.00
MW-27-085	80	460.99	2/2/2016	6.98	0.62	454.00
MW-27-085	80	460.99	2/2/2016	6.95	0.62	454.00
MW-27-085	80	460.99	3/2/2016	5.93	0.62	455.00
MW-27-085	80	460.99	4/4/2016	4.88	0.62	456.00
MW-27-085	80	460.99	5/3/2016	4.66	0.62	456.00
MW-27-085	80	460.99	6/6/2016	5.83	0.62	455.00
MW-27-085	80	460.99	7/5/2016	5.32	0.62	455.00
MW-27-085	80	460.99	8/1/2016	6.52	0.62	454.00
MW-27-085	80	460.99	9/8/2016	6.02	0.62	455.00
MW-27-085	80	460.99	10/3/2016	5.97	0.62	455.00
MW-27-085	80	460.99	10/31/2016	8.07	0.62	453.00
MW-27-085	80	460.99	12/5/2016	7.76	0.62	453.00
MW-27-085B	80	460.99	1/5/2016	7.48	0.62	453.00
MW-27-085B	80	460.99	2/2/2016	6.95	0.62	454.00
MW-27-085B	80	460.99	2/2/2016	6.98	0.62	454.00
MW-27-085B	80	460.99	3/2/2016	5.93	0.62	455.00
MW-27-085B	80	460.99	4/4/2016	4.88	0.62	456.00
MW-27-085b	80	460.99	5/3/2016	4.66	0.62	456.00
MW-27-085b	80	460.99	6/6/2016	5.83	0.62	--
MW-27-085B	80	460.99	7/5/2016	5.32	0.62	--
MW-27-085B	80	460.99	8/1/2016	6.52	0.62	--
MW-28-025	21	466.77	1/6/2016	12.89	0.06	453.00
MW-28-025	21	466.77	2/3/2016	12.82	0.06	453.00
MW-28-090	98	467.53	1/6/2016	13.47	0.46	454.00
MW-28-090	98	467.53	2/3/2016	13.94	0.46	453.00
MW-30-050	53	468.81	1/5/2016	15.50	0.07	453.00
MW-30-050	53	468.81	2/2/2016	14.55	0.07	454.00
MW-31-060	64	496.81	1/6/2016	42.94	0.22	453.00
MW-31-060	64	496.81	2/1/2016	42.91	0.22	453.00

Table D-2
Manual Water Level Measurements, January 2016 through December 2016
Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

Location ID	Well Depth (feet BMP)	Measuring Point Elevation (feet amsl)	Monitoring Date	Water Level Measurement (feet BMP)	Salinity (percent)	Groundwater Elevation Adjusted for Salinity (feet amsl)
MW-31-135	135	498.11	1/5/2016	45.31	0.69	452.00
MW-31-135	135	498.11	2/1/2016	44.98	0.69	453.00
MW-31-135	135	498.11	2/29/2016	44.82	0.69	453.00
MW-31-135	135	498.11	4/4/2016	42.33	0.69	455.00
MW-31-135	135	498.11	5/2/2016	43.64	0.69	454.00
MW-31-135	135	498.11	6/8/2016	42.48	0.69	455.00
MW-31-135	135	498.11	7/5/2016	43.65	0.69	454.00
MW-31-135	135	498.11	8/2/2016	42.93	0.69	455.00
MW-31-135	135	498.11	9/8/2016	44.22	0.69	453.00
MW-31-135	135	498.11	10/3/2016	44.29	0.69	453.00
MW-31-135	135	498.11	10/31/2016	45.16	0.69	453.00
MW-31-135	135	498.11	12/5/2016	45.65	0.69	452.00
MW-31-135B	135	498.11	1/5/2016	45.31	0.69	452.00
MW-31-135B	135	498.11	2/1/2016	44.98	0.69	453.00
MW-31-135B	135	498.11	2/29/2016	44.82	0.69	--
MW-31-135B	135	498.11	4/4/2016	42.33	0.69	--
MW-31-135b	135	498.11	5/2/2016	43.64	0.69	--
MW-31-135b	135	498.11	6/8/2016	42.48	0.69	--
MW-31-135B	135	498.11	7/5/2016	43.65	0.69	--
MW-31-135B	135	498.11	8/2/2016	42.93	0.69	--
MW-32-035	37	461.63	1/5/2016	8.05	0.82	453.00
MW-32-035	37	461.63	2/2/2016	7.58	0.82	454.00
MW-33-040	42	487.38	1/6/2016	33.32	0.57	454.00
MW-33-040	42	487.38	2/3/2016	33.38	0.57	454.00
MW-33-090	88	487.55	1/6/2016	33.44	0.66	454.00
MW-33-090	88	487.55	2/3/2016	33.64	0.66	453.00
MW-33-150	155	487.77	1/6/2016	33.84	1.02	454.00
MW-33-150	155	487.77	2/3/2016	34.17	1.02	454.00
MW-33-150	155	487.77	3/3/2016	33.28	1.02	455.00
MW-33-150	155	487.77	4/4/2016	31.96	1.02	456.00
MW-33-150	155	487.77	5/4/2016	31.98	1.02	456.00
MW-33-150	155	487.77	6/9/2016	31.97	1.02	456.00
MW-33-150	155	487.77	7/7/2016	32.12	1.02	456.00
MW-33-150	155	487.77	8/3/2016	32.58	1.02	455.00
MW-33-150	155	487.77	9/8/2016	33.00	1.02	455.00
MW-33-150	155	487.77	10/3/2016	33.07	1.02	455.00
MW-33-150	155	487.77	10/31/2016	34.37	1.02	453.00
MW-33-150	155	487.77	12/5/2016	34.45	1.02	453.00
MW-33-150B	155	487.77	1/6/2016	33.84	1.02	454.00
MW-33-150B	155	487.77	2/3/2016	34.17	1.02	454.00
MW-33-150B	155	487.77	3/3/2016	33.28	1.02	455.00
MW-33-150B	155	487.77	4/4/2016	31.96	1.02	456.00
MW-33-150b	155	487.77	5/4/2016	31.98	1.02	456.00
MW-33-150b	155	487.77	6/9/2016	31.97	1.02	456.00
MW-33-150B	155	487.77	7/7/2016	32.12	1.02	--
MW-33-150B	155	487.77	8/3/2016	32.58	1.02	--
MW-34-055	57	460.95	1/5/2016	7.22	0.06	453.00
MW-34-055	57	460.95	2/2/2016	6.56	0.06	454.00
MW-34-080	84	461.20	1/5/2016	7.55	0.45	453.00
MW-34-080	84	461.20	2/2/2016	6.75	0.45	454.00
MW-34-100	117	460.97	1/5/2016	8.02	1.02	453.00
MW-34-100	117	460.97	2/2/2016	7.14	1.02	454.00
MW-34-100	117	460.97	3/2/2016	6.18	1.02	455.00
MW-34-100	117	460.97	4/4/2016	4.96	1.02	456.00
MW-34-100	117	460.97	5/3/2016	5.11	1.02	456.00
MW-34-100	117	460.97	6/6/2016	5.82	1.02	455.00
MW-34-100	117	460.97	7/5/2016	5.62	1.02	455.00

Table D-2
Manual Water Level Measurements, January 2016 through December 2016
Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

Location ID	Well Depth (feet BMP)	Measuring Point Elevation (feet amsl)	Monitoring Date	Water Level Measurement (feet BMP)	Salinity (percent)	Groundwater Elevation Adjusted for Salinity (feet amsl)
MW-34-100	117	460.97	8/1/2016	6.21	1.02	455.00
MW-34-100	117	460.97	9/8/2016	6.41	1.02	455.00
MW-34-100	117	460.97	10/3/2016	6.18	1.02	455.00
MW-34-100	117	460.97	10/31/2016	8.49	1.02	453.00
MW-34-100	117	460.97	12/6/2016	7.28	1.02	454.00
MW-34-100B	117	460.97	1/5/2016	8.02	1.02	453.00
MW-34-100B	117	460.97	2/2/2016	7.14	1.02	454.00
MW-34-100B	117	460.97	3/2/2016	6.18	1.02	--
MW-34-100B	117	460.97	4/4/2016	4.96	1.02	--
MW-34-100b	117	460.97	5/3/2016	5.11	1.02	--
MW-34-100b	117	460.97	6/6/2016	5.82	1.02	--
MW-34-100B	117	460.97	7/5/2016	5.62	1.02	--
MW-34-100B	117	460.97	8/1/2016	6.21	1.02	--
MW-35-060	57	484.33	1/4/2016	30.27	0.44	454.00
MW-35-060	57	484.33	2/1/2016	29.62	0.44	454.00
MW-35-135	159	484.24	1/4/2016	29.84	0.68	454.00
MW-35-135	159	484.24	2/1/2016	29.44	0.68	454.00
MW-36-020	20	469.33	1/5/2016	15.79	0.45	453.00
MW-36-020	20	469.33	2/2/2016	15.22	0.45	454.00
MW-36-040	40	469.59	1/5/2016	16.17	0.08	453.00
MW-36-040	40	469.59	2/2/2016	15.44	0.08	454.00
MW-36-050	108	469.62	1/5/2016	16.15	0.08	453.00
MW-36-050	108	469.62	2/2/2016	15.46	0.08	453.00
MW-36-070	70	469.27	1/5/2016	15.84	0.07	453.00
MW-36-070	70	469.27	2/2/2016	15.13	0.07	454.00
MW-36-090	90	469.64	1/5/2016	16.98	0.07	452.00
MW-36-090	90	469.64	2/2/2016	15.92	0.07	453.00
MW-36-100	108	469.65	1/5/2016	17.03	0.48	452.00
MW-36-100	108	469.65	2/2/2016	15.99	0.48	453.00
MW-37S	85	485.97	2/4/2016	31.74	0.34	454.00
MW-38S	98	525.51	2/4/2016	71.38	0.16	454.00
MW-39-040	42	468.02	1/5/2016	14.79	0.10	453.00
MW-39-040	42	468.02	2/3/2016	14.35	0.10	453.00
MW-39-050	55	467.93	1/5/2016	14.76	0.09	453.00
MW-39-050	55	467.93	2/3/2016	14.38	0.09	453.00
MW-39-060	66	468.00	1/5/2016	14.96	0.10	452.00
MW-39-060	66	468.00	2/2/2016	13.79	0.10	454.00
MW-39-070	72	468.02	1/5/2016	15.43	0.17	452.00
MW-39-070	72	468.02	2/3/2016	15.19	0.17	452.00
MW-39-080	83	467.92	1/5/2016	15.33	0.41	452.00
MW-39-080	83	467.92	2/3/2016	15.11	0.41	452.00
MW-39-100	118	468.12	1/5/2016	15.53	1.05	453.00
MW-39-100	118	468.12	2/2/2016	14.98	1.05	453.00
MW-41S	60	480.07	2/4/2016	25.08	0.32	454.00
MW-42-030	30	463.74	1/5/2016	10.32	0.26	453.00
MW-42-030	30	463.74	2/2/2016	9.73	0.26	453.00
MW-42-065	80	463.37	1/5/2016	9.92	0.45	453.00
MW-42-065	80	463.37	2/2/2016	9.31	0.45	454.00
MW-43-025	25	462.54	1/5/2016	8.66	0.09	453.00
MW-43-025	25	462.54	2/2/2016	8.14	0.09	454.00
MW-43-090	97	462.76	1/5/2016	9.18	1.15	454.00
MW-43-090	97	462.76	2/2/2016	8.67	1.15	454.00
MW-44-070	70	471.90	1/5/2016	18.40	0.14	453.00
MW-44-070	70	471.90	2/2/2016	17.57	0.14	454.00
MW-44-115	114	472.01	1/5/2016	19.18	0.72	453.00
MW-44-115	114	472.01	2/2/2016	18.04	0.72	454.00
MW-44-125	129	472.04	1/5/2016	18.71	0.64	453.00

Table D-2
Manual Water Level Measurements, January 2016 through December 2016
Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

Location ID	Well Depth (feet BMP)	Measuring Point Elevation (feet amsl)	Monitoring Date	Water Level Measurement (feet BMP)	Salinity (percent)	Groundwater Elevation Adjusted for Salinity (feet amsl)
MW-44-125	129	472.04	2/2/2016	17.75	0.64	454.00
MW-45-095a	97	470.03	1/5/2016	17.88	0.28	452.00
MW-45-095a	97	470.03	2/2/2016	14.73	0.28	455.00
MW-45-095a	97	468.27	3/1/2016	13.46	0.28	454.00
MW-45-095a	97	468.27	4/4/2016	12.23	0.28	456.00
MW-45-095a	97	468.27	5/3/2016	12.76	0.28	455.00
MW-45-095a	97	468.27	6/6/2016	13.34	0.28	454.00
MW-45-095a	97	468.27	7/5/2016	13.05	0.28	455.00
MW-45-095a	97	468.27	8/1/2016	13.68	0.28	454.00
MW-45-095a	97	468.27	9/8/2016	16.61	0.28	451.00
MW-45-095a	97	468.27	10/3/2016	13.59	0.28	454.00
MW-45-095a	97	468.27	10/31/2016	18.03	0.28	450.00
MW-45-095a	97	468.27	12/5/2016	15.18	0.28	453.00
MW-45-095aB	97	470.03	1/5/2016	17.88	0.28	452.00
MW-45-095aB	97	470.03	2/2/2016	14.73	0.28	455.00
MW-45-095aB	97	468.27	3/1/2016	13.46	0.28	454.00
MW-45-095aB	97	468.27	4/4/2016	12.23	0.28	456.00
MW-45-095ab	97	468.27	5/3/2016	12.76	0.28	455.00
MW-45-095ab	97	468.27	6/6/2016	13.34	0.28	454.00
MW-45-095aB	97	468.27	7/5/2016	13.05	0.28	--
MW-45-095aB	97	468.27	8/1/2016	13.68	0.28	--
MW-46-175	176	482.16	1/6/2016	28.69	1.17	454.00
MW-46-175	176	482.16	2/3/2016	29.16	1.17	453.00
MW-47-055	55	484.04	1/6/2016	29.66	0.29	454.00
MW-47-055	55	484.04	2/3/2016	29.62	0.29	454.00
MW-47-115	115	484.17	1/6/2016	29.94	0.90	454.00
MW-47-115	115	484.17	2/3/2016	30.07	0.90	454.00
MW-49-135	135	484.02	1/6/2016	29.91	0.89	454.00
MW-49-135	135	484.02	2/3/2016	30.06	0.89	454.00
MW-50-095	95	496.49	1/6/2016	42.36	0.35	454.00
MW-50-095	95	496.49	2/1/2016	41.38	0.35	455.00
MW-51	113	501.56	1/5/2016	47.52	0.72	454.00
MW-51	113	501.56	2/2/2016	47.51	0.72	454.00
MW-54-085	93	466.10	1/4/2016	12.32	0.67	453.00
MW-54-085	93	466.10	2/3/2016	11.36	0.67	454.00
MW-54-140	138	465.98	1/4/2016	11.97	0.84	454.00
MW-54-140	138	465.98	2/3/2016	11.22	0.84	455.00
MW-54-195	195	466.32	1/4/2016	12.56	1.27	454.00
MW-55-045	54	465.66	2/3/2016	10.10	0.10	455.00
MW-55-120	120	465.46	1/5/2016	10.22	0.57	455.00
MW-55-120	120	465.46	2/3/2016	10.08	0.57	455.00
OW-01S	114	550.21	1/4/2016	94.43	0.42	455.00
OW-01S	114	550.21	2/1/2016	94.58	0.42	455.00
OW-02S	104	548.88	1/4/2016	93.25	0.16	455.00
OW-02S	104	548.88	2/1/2016	93.24	0.16	455.00
OW-05D	350	552.41	1/4/2016	95.91	0.49	456.00
OW-05D	350	552.41	2/1/2016	95.94	0.49	456.00
OW-05M	250	551.81	1/4/2016	95.24	0.49	456.00
OW-05M	250	551.81	2/1/2016	95.38	0.49	456.00
OW-05S	110	551.83	1/4/2016	96.03	0.37	455.00
PT2D	105	473.48	1/6/2016	19.93	0.80	--
PT2D	105	473.48	2/3/2016	21.67	0.80	--
PT5D	105	473.65	1/6/2016	20.86	1.02	--
PT5D	105	473.65	2/3/2016	20.78	1.02	--
PT6D	105	476.08	1/6/2016	22.38	0.71	--
PT6D	105	476.08	2/3/2016	23.29	0.71	--
RRB	--	458.73	1/6/2016	4.76	--	453.00

Table D-2

Manual Water Level Measurements, January 2016 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

Location ID	Well Depth (feet BMP)	Measuring Point Elevation (feet amsl)	Monitoring Date	Water Level Measurement (feet BMP)	Salinity (percent)	Groundwater Elevation Adjusted for Salinity (feet amsl)
RRB	--	458.73	2/3/2016	5.28	--	453.00

Notes:
--- = data were not collected, were not available, were rejected or there was a field instrument malfunction.
amsl = above mean sea level
BMP = below well measuring point.

Well depths rounded off to whole foot.
Salinity used to adjust water level to freshwater equivalent. Salinity values have been averaged in accordance with the Performance Monitoring Program

Table D-3

Field Water Quality Measurements, January 2016 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

Location ID	Sample Date	Specific Conductance (µS/cm)	Temperature (deg C)	pH	ORP (mV)	Dissolved Oxygen (mg/L)
C-BNS-D	1/26/2016	1,010	11.2	8.3	130	10.09
C-BNS-D	2/23/2016	1,080	13.9	8.1	97	7.95
C-BNS-D	4/27/2016	993	15.9	8.1	150	8.62
C-BNS-D	7/6/2016	836	21.4	8.0	-100	8.06
C-BNS-D	11/29/2016	1,010	15.8	8.3	170	--
C-CON-D	1/27/2016	1,000	10.8	8.3	120	10.65
C-CON-D	2/24/2016	1,090	12.6	8.1	140	7.69
C-CON-D	4/28/2016	1,090	14.9	8.1	78	8.77
C-CON-D	11/30/2016	1,020	16.9	8.3	180	8.05
C-CON-S	1/27/2016	1,000	10.8	8.3	120	10.55
C-CON-S	2/24/2016	1,090	12.7	8.1	130	7.47
C-CON-S	4/28/2016	1,090	15.0	8.1	20	8.27
C-CON-S	11/30/2016	1,020	16.9	8.3	180	8.07
C-I-3-D	1/26/2016	1,010	10.7	8.3	140	--
C-I-3-D	2/23/2016	1,070	13.3	8.1	110	8.25
C-I-3-D	4/27/2016	988	15.6	8.2	220	8.77
C-I-3-D	7/6/2016	833	20.2	8.0	-77	8.13
C-I-3-D	11/29/2016	1,010	15.2	8.3	170	8.45
C-I-3-S	1/26/2016	1,010	10.8	8.3	140	10.6
C-I-3-S	2/23/2016	1,080	13.7	8.1	110	7.61
C-I-3-S	4/27/2016	988	15.4	8.1	180	8.69
C-I-3-S	7/6/2016	833	20.2	8.0	-76	7.86
C-I-3-S	11/29/2016	1,020	15.9	8.3	170	7.82
C-MAR-D	1/27/2016	1,020	9.30	8.1	150	10.63
C-MAR-D	2/23/2016	1,200	14.3	7.8	100	6.54
C-MAR-D	4/27/2016	1,070	17.5	7.7	52	6.93
C-MAR-D	7/6/2016	903	24.4	7.7	-96	5.76
C-MAR-D	11/30/2016	1,160	12.3	8.0	190	8.82
C-MAR-S	1/27/2016	1,020	9.30	8.2	140	10.12
C-MAR-S	2/23/2016	1,220	15.0	7.7	100	6.09
C-MAR-S	4/27/2016	1,070	17.6	7.5	48	6.27
C-MAR-S	7/6/2016	912	24.8	7.6	-94	5.95
C-MAR-S	11/30/2016	1,170	12.3	8.8	190	8.78
C-NR1-D	1/27/2016	1,000	10.9	8.3	120	10.7
C-NR1-D	2/24/2016	1,090	13.4	8.1	130	8.15
C-NR1-D	4/28/2016	1,090	15.0	8.1	19	8.67
C-NR1-D	11/30/2016	1,010	16.4	8.3	180	8.47
C-NR1-S	1/27/2016	1,010	11.2	8.3	130	10.25
C-NR1-S	2/24/2016	1,100	15.0	8.1	120	7.92
C-NR1-S	4/28/2016	1,090	15.1	8.1	3.9	8.59
C-NR1-S	11/30/2016	1,010	16.8	8.3	180	7.39
C-NR3-D	1/27/2016	1,000	11.0	8.3	140	10.54
C-NR3-D	2/24/2016	1,100	15.7	8.1	110	7.97
C-NR3-D	4/28/2016	1,090	15.2	8.1	16	8.77
C-NR3-D	11/30/2016	1,010	16.8	8.3	180	8.94
C-NR3-S	1/27/2016	1,000	11.1	8.3	120	10.26
C-NR3-S	2/24/2016	1,100	16.4	8.1	95	8.11
C-NR3-S	4/28/2016	1,090	15.3	8.1	26	8.51
C-NR3-S	11/30/2016	1,010	16.9	8.3	170	8.53

Table D-3

Field Water Quality Measurements, January 2016 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

Location ID	Sample Date	Specific Conductance (µS/cm)	Temperature (deg C)	pH	ORP (mV)	Dissolved Oxygen (mg/L)
C-NR4-D	1/27/2016	1,000	11.0	8.3	120	10.75
C-NR4-D	2/24/2016	1,100	16.0	8.1	100	7.57
C-NR4-D	4/28/2016	1,090	15.3	8.1	16	8.48
C-NR4-D	11/30/2016	1,010	16.6	8.3	170	7.6
C-NR4-S	1/27/2016	1,000	11.2	8.3	120	10.42
C-NR4-S	2/24/2016	1,100	15.6	8.1	97	7.26
C-NR4-S	4/28/2016	1,090	15.1	8.1	19	--
C-NR4-S	11/30/2016	1,010	16.3	8.3	180	8.54
C-R22A-D	1/26/2016	1,010	11.0	8.3	130	10.33
C-R22A-D	2/23/2016	1,080	13.3	8.2	100	7.76
C-R22A-D	4/27/2016	990	16.1	8.2	160	8.75
C-R22A-D	7/6/2016	835	20.9	8.1	-93	8.36
C-R22A-D	11/29/2016	1,020	16.2	8.3	170	8.12
C-R22A-S	1/26/2016	1,020	11.0	8.3	130	10.43
C-R22A-S	2/23/2016	1,080	13.4	8.2	110	8.01
C-R22A-S	4/27/2016	993	16.0	8.2	100	8.5
C-R22A-S	7/6/2016	835	20.8	8.1	-91	8.3
C-R22A-S	11/29/2016	1,020	16.2	8.4	170	7.17
C-R27-D	1/26/2016	1,010	11.2	8.3	130	10.62
C-R27-D	2/23/2016	1,090	14.5	8.1	90	7.65
C-R27-D	4/28/2016	1,110	14.9	7.9	150	8.59
C-R27-D	7/6/2016	838	20.9	8.0	-93	8.17
C-R27-D	11/29/2016	1,010	15.8	8.3	180	8.41
C-R27-S	1/26/2016	1,010	11.2	8.3	130	10.16
C-R27-S	2/23/2016	1,080	13.9	8.1	93	8.29
C-R27-S	4/28/2016	1,090	14.9	8.0	150	8.63
C-R27-S	7/6/2016	838	21.3	8.0	-100	7.84
C-R27-S	11/29/2016	1,010	15.9	8.3	190	8.67
C-TAZ-D	2/5/2016	1,050	10.9	8.2	160	10.29
C-TAZ-D	2/23/2016	1,080	13.4	8.0	140	7.86
C-TAZ-D	4/27/2016	984	15.6	8.2	180	8.65
C-TAZ-D	7/6/2016	857	20.7	7.8	-25	8.06
C-TAZ-D	11/29/2016	1,350	15.3	8.2	170	7.66
C-TAZ-S	1/26/2016	1,010	10.9	8.3	150	10.24
C-TAZ-S	2/23/2016	1,080	13.3	8.1	130	7.95
C-TAZ-S	4/27/2016	984	15.5	8.1	180	8.9
C-TAZ-S	7/6/2016	832	20.5	8.0	-56	8.23
C-TAZ-S	11/29/2016	1,020	15.8	8.3	180	7.71
MW-09	5/3/2016	3,330	32.2	7.6	64	3.6
MW-09	12/7/2016	3,080	31.1	7.5	20	5.12
MW-10	5/3/2016	3,170	31.2	7.3	42	4.14
MW-10	12/7/2016	2,470	30.6	7.5	18	5.96
MW-11	5/3/2016	2,450	31.5	7.5	90	5.53
MW-11	12/7/2016	2,410	31.3	7.6	1.9	7.81
MW-12	5/2/2016	7,490	28.7	7.9	-11	3.52
MW-12	12/7/2016	7,000	27.8	8.2	-100	2.97
MW-13	12/8/2016	2,420	27.9	7.6	-89	3.56
MW-14	4/27/2016	2,400	31.8	7.6	63	4.72
MW-14	12/8/2016	2,430	30.8	7.6	23	7.07

Table D-3

Field Water Quality Measurements, January 2016 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

Location ID	Sample Date	Specific Conductance (µS/cm)	Temperature (deg C)	pH	ORP (mV)	Dissolved Oxygen (mg/L)
MW-15	12/12/2016	1,920	32.0	7.7	100	7.69
MW-18	12/8/2016	1,530	30.4	7.7	26	6.91
MW-19	4/27/2016	2,790	29.9	7.3	83	6.41
MW-19	12/8/2016	2,220	28.3	7.5	47	5.89
MW-20-070	4/27/2016	2,020	29.2	7.8	100	6.3
MW-20-070	12/9/2016	1,920	29.8	7.8	41	8.25
MW-20-100	4/27/2016	2,590	29.5	7.4	110	3.99
MW-20-100	12/9/2016	2,350	28.7	7.4	60	6.94
MW-20-130	4/27/2016	14,200	29.3	7.7	69	1.43
MW-20-130	12/9/2016	13,200	28.9	7.7	60	1.06
MW-21	5/3/2016	11,700	28.0	6.6	-4.1	3.19
MW-21	12/14/2016	15,700	28.3	7.2	25	1.58
MW-22	4/25/2016	12,500	24.1	6.7	-95	0.17
MW-22	12/6/2016	19,000	25.4	6.7	-96	0.32
MW-23-060	5/2/2016	18,200	32.0	9.8	-57	3.15
MW-23-060	12/14/2016	19,000	29.8	9.7	76	3.86
MW-23-080	5/2/2016	18,500	31.8	10	-160	0.22
MW-23-080	12/14/2016	19,200	29.9	10	24	0.32
MW-24A	5/3/2016	1,860	32.4	8.3	-200	0.1
MW-24A	12/6/2016	1,670	32.5	8.4	-180	0.13
MW-24B	5/3/2016	20,200	30.9	7.7	-100	0.13
MW-24B	12/6/2016	17,300	30.2	7.8	-190	0.13
MW-24BR	12/7/2016	14,400	31.4	8.2	-220	0.13
MW-25	4/27/2016	2,250	31.3	7.0	87	7.27
MW-25	12/8/2016	1,890	30.9	7.3	47	6.84
MW-26	4/28/2016	4,450	28.7	7.5	96	5.34
MW-26	12/8/2016	4,130	29.6	7.4	56	5.89
MW-27-020	12/6/2016	1,140	20.7	7.6	40	0.11
MW-27-060	12/6/2016	973	18.3	7.6	-63	0.09
MW-27-085	4/25/2016	11,700	20.6	7.2	-0.50	0.16
MW-27-085	12/6/2016	10,800	19.1	7.3	32	0.15
MW-28-025	4/26/2016	1,230	21.4	7.2	-15	0.51
MW-28-025	12/8/2016	1,330	22.9	7.3	51	0.24
MW-28-090	4/26/2016	5,080	20.8	7.2	-75	0.11
MW-28-090	12/8/2016	4,350	20.3	7.2	-46	0.1
MW-29	4/26/2016	2,800	24.5	7.2	-140	0.06
MW-29	12/8/2016	2,500	24.0	7.3	-37	0.72
MW-30-030	12/6/2016	16,800	22.7	7.6	-140	1.01
MW-30-050	12/6/2016	1,120	20.7	7.6	49	0.08
MW-31-060	4/27/2016	3,180	28.9	7.6	110	4.6
MW-31-060	12/9/2016	2,960	27.1	7.6	-72	3.39
MW-31-135	12/9/2016	11,400	25.4	7.7	-91	0.62
MW-32-020	12/6/2016	40,900	26.5	7.0	-93	0.58
MW-32-035	4/25/2016	12,700	25.1	6.9	-150	0.17
MW-32-035	12/6/2016	10,400	24.1	7.0	-82	0.06
MW-33-040	4/26/2016	7,580	27.5	8.0	78	0.14
MW-33-040	12/8/2016	16,500	26.4	7.7	32	1.15
MW-33-090	4/26/2016	11,000	27.0	7.0	-17	0.21
MW-33-090	12/8/2016	9,430	26.2	7.2	22	0.46

Table D-3

Field Water Quality Measurements, January 2016 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California

Location ID	Sample Date	Specific Conductance (µS/cm)	Temperature (deg C)	pH	ORP (mV)	Dissolved Oxygen (mg/L)
MW-33-150	4/26/2016	16,900	26.6	7.2	11	0.53
MW-33-150	12/8/2016	16,500	26.2	7.4	57	0.61
MW-33-210	4/26/2016	20,500	27.6	7.4	52	0.19
MW-33-210	12/8/2016	21,600	25.6	7.4	55	0.15
MW-34-055	12/6/2016	1,130	19.6	7.7	21	0.15
MW-34-080	4/26/2016	9,120	17.4	7.2	-190	0.11
MW-34-080	12/6/2016	6,900	19.9	7.2	-4.4	0.09
MW-34-100	2/25/2016	14,100	18.4	7.7	-36	0.31
MW-34-100	4/26/2016	15,500	19.6	7.4	-29	0.22
MW-34-100	12/6/2016	14,900	19.7	7.6	-53	0.3
MW-35-060	4/27/2016	6,830	27.9	7.2	60	1.46
MW-35-060	12/9/2016	8,130	26.3	7.3	46	0.71
MW-35-135	4/27/2016	12,700	27.4	7.4	22	0.26
MW-35-135	12/9/2016	11,800	26.3	7.7	48	0.38
MW-36-020	12/7/2016	9,070	22.3	7.3	-99	0.07
MW-36-040	12/7/2016	1,110	21.4	7.8	-150	0.05
MW-36-050	12/7/2016	971	21.0	7.6	-52	0.05
MW-36-070	12/7/2016	1,090	20.8	7.9	66	0.86
MW-36-090	4/26/2016	4,050	18.9	7.7	-170	0.16
MW-36-090	12/7/2016	1,150	20.2	8.2	-4.1	0.14
MW-36-100	4/26/2016	8,130	21.6	7.2	-81	0.29
MW-36-100	12/7/2016	8,210	20.7	7.4	-40	0.1
MW-37D	4/27/2016	17,200	30.0	7.5	-4.6	0.16
MW-37D	12/8/2016	14,900	26.8	7.7	-71	0.42
MW-37S	12/8/2016	6,420	26.9	7.6	-98	0.82
MW-38D	5/3/2016	24,000	31.7	7.8	-120	0.05
MW-38D	9/29/2016	1,700	33.3	7.8	-62	0.28
MW-38D	12/7/2016	22,600	31.7	8.0	-71	0.12
MW-38S	2/24/2016	1,670	30.2	7.8	-210	0.14
MW-38S	5/3/2016	1,810	30.4	7.6	-180	0.07
MW-38S	9/29/2016	1,650	31.1	7.8	-80	0.18
MW-38S	12/7/2016	1,460	30.3	8.0	-87	0.09
MW-39-040	12/7/2016	1,120	21.1	8.0	-150	0.09
MW-39-050	12/7/2016	1,010	21.2	7.6	12	0.07
MW-39-060	12/7/2016	1,070	21.2	7.7	23	0.06
MW-39-070	12/7/2016	1,580	20.8	7.7	77	0.7
MW-39-080	12/7/2016	2,260	20.9	7.9	33	0.17
MW-39-100	4/26/2016	19,500	20.9	6.7	-120	0.3
MW-39-100	12/7/2016	16,200	21.4	6.8	87	0.11
MW-40D	5/4/2016	16,800	31.6	7.3	25	0.4
MW-41D	4/27/2016	21,200	29.7	7.6	23	0.2
MW-41D	12/8/2016	21,400	28.0	7.7	-130	0.13
MW-41M	12/8/2016	15,000	27.8	7.6	-120	0.31
MW-41S	12/8/2016	6,050	28.1	7.8	-120	1
MW-42-030	12/6/2016	2,610	23.2	7.9	-110	0.82
MW-42-055	4/26/2016	1,230	21.9	8.3	-110	0.15
MW-42-055	12/6/2016	1,210	21.3	8.5	26	0.07
MW-42-065	4/26/2016	4,620	19.8	7.5	-120	0.12
MW-42-065	12/6/2016	4,830	21.5	7.5	52	0.11

Table D-3

Field Water Quality Measurements, January 2016 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

Location ID	Sample Date	Specific Conductance (µS/cm)	Temperature (deg C)	pH	ORP (mV)	Dissolved Oxygen (mg/L)
MW-43-025	12/7/2016	1,430	21.2	7.4	-71	0.06
MW-43-075	12/9/2016	9,700	20.7	7.2	-110	0.16
MW-43-090	12/9/2016	14,100	20.1	7.3	22	0.49
MW-44-070	4/26/2016	2,630	17.8	18	-160	0.09
MW-44-070	12/7/2016	1,810	19.6	7.7	-39	0.18
MW-44-115	2/25/2016	12,300	19.9	7.9	-110	0.2
MW-44-115	4/26/2016	11,900	20.9	7.8	14	0.17
MW-44-115	12/7/2016	11,500	20.6	7.9	25	0.3
MW-44-125	4/26/2016	10,500	18.8	7.4	-37	0.18
MW-44-125	12/7/2016	9,120	20.5	7.7	-45	0.25
MW-46-175	2/25/2016	20,100	20.3	8.2	77	0.17
MW-46-175	4/26/2016	19,400	22.5	8.3	-40	0.12
MW-46-175	12/8/2016	19,100	21.5	8.3	-11	0.27
MW-46-205	4/26/2016	23,400	22.4	8.1	-91	0.2
MW-46-205	12/8/2016	24,600	20.6	8.3	31	0.21
MW-47-055	4/26/2016	5,260	27.9	7.1	120	2.17
MW-47-055	12/8/2016	5,070	26.3	7.5	25	1.66
MW-47-115	4/26/2016	13,800	27.7	7.6	150	0.37
MW-47-115	12/8/2016	15,600	25.8	7.5	52	0.2
MW-48	5/4/2016	19,200	29.1	7.6	6.9	2.42
MW-48	12/14/2016	20,200	27.7	8.1	48	2.22
MW-49-135	12/8/2016	15,100	24.2	7.8	-54	0.08
MW-49-275	12/8/2016	24,200	23.7	8.0	2.0	0.37
MW-49-365	12/8/2016	34,600	23.0	7.8	-100	0.41
MW-50-095	4/27/2016	6,030	29.4	7.6	45	1.58
MW-50-095	12/9/2016	5,530	27.9	7.8	-98	1.05
MW-50-200	4/27/2016	25,000	29.9	7.5	81	2.01
MW-50-200	12/9/2016	21,400	29.3	7.5	-93	1.62
MW-51	4/27/2016	12,200	30.7	7.5	100	3.78
MW-51	12/9/2016	13,200	29.9	7.4	62	1.65
MW-52D	4/25/2016	23,000	20.6	7.6	-150	0.07
MW-52D	12/5/2016	23,600	19.2	7.0	-90	0.24
MW-52M	4/25/2016	17,900	21.8	7.2	-180	0.07
MW-52M	12/5/2016	17,700	19.9	7.0	-120	0.25
MW-52S	4/25/2016	10,400	20.4	6.9	-120	0.09
MW-52S	12/5/2016	13,200	19.8	7.1	-87	0.73
MW-53D	4/27/2016	27,300	19.3	8.0	-140	0.19
MW-53D	12/5/2016	29,000	19.9	6.9	-82	0.61
MW-53M	4/27/2016	19,700	18.8	7.4	-120	0.14
MW-53M	12/5/2016	4,690	20.3	8.0	-150	0.15
MW-54-085	4/29/2016	10,200	24.9	7.4	-12	0.11
MW-54-085	12/15/2016	10,000	27.2	7.4	-110	0.15
MW-54-140	4/29/2016	13,500	26.7	7.5	-59	0.13
MW-54-140	12/15/2016	12,200	26.4	7.7	-120	0.11
MW-54-195	4/29/2016	20,500	26.3	7.8	-210	0.13
MW-54-195	12/15/2016	20,900	25.8	8.2	-97	0.12
MW-55-045	5/5/2016	1,510	27.6	7.6	-190	0.14
MW-55-045	12/15/2016	1,520	28.1	7.8	-14	0.06
MW-55-120	2/24/2016	9,290	28.2	8.0	-87	0.97

Table D-3

Field Water Quality Measurements, January 2016 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,

PG&E Topock Compressor Station, Needles, California

Location ID	Sample Date	Specific Conductance (µS/cm)	Temperature (deg C)	pH	ORP (mV)	Dissolved Oxygen (mg/L)
MW-55-120	5/5/2016	8,630	28.5	7.9	-20	1.18
MW-55-120	9/30/2016	8,990	28.4	8.0	140	0.85
MW-55-120	12/15/2016	7,620	28.9	7.9	-110	1.18
MW-56D	5/5/2016	22,500	22.9	7.5	-140	0.73
MW-56D	12/14/2016	24,100	22.8	7.6	-34	0.55
MW-56M	5/5/2016	15,600	22.7	7.1	-140	0.68
MW-56M	12/14/2016	14,100	22.8	7.2	-110	0.52
MW-56S	5/5/2016	6,740	22.0	6.9	-130	0.33
MW-56S	12/14/2016	6,640	22.6	6.9	-110	0.38
MW-57-070	4/28/2016	2,370	31.7	7.2	87	3.49
MW-57-070	12/13/2016	2,670	31.0	7.2	85	3.82
MW-57-185	4/28/2016	19,800	29.4	9.8	-36	0.29
MW-57-185	12/13/2016	20,800	29.6	8.9	32	0.14
MW-58BR	2/24/2016	9,140	27.1	7.4	40	0.19
MW-58BR	4/28/2016	8,900	25.9	7.6	-7.4	0.21
MW-58BR	9/27/2016	8,600	27.8	7.2	-170	0.33
MW-58BR	12/13/2016	9,600	27.7	7.6	66	0.15
MW-59-100	4/29/2016	12,300	30.9	7.0	100	4.64
MW-59-100	12/7/2016	9,870	30.8	7.0	77	6.44
MW-60-125	4/28/2016	10,800	31.1	7.2	64	3.74
MW-60-125	12/14/2016	10,400	30.9	7.4	84	2.48
MW-60BR-245	2/23/2016	18,900	26.9	8.1	-81	1.7
MW-60BR-245	4/29/2016	18,900	29.2	8.0	-150	0.15
MW-60BR-245	9/29/2016	17,400	29.2	8.0	-150	0.23
MW-60BR-245	12/14/2016	19,800	29.6	8.2	-65	0.36
MW-61-110	4/29/2016	17,600	30.5	7.5	-55	0.19
MW-61-110	12/13/2016	17,000	30.2	7.4	-67	0.26
MW-62-065	2/23/2016	6,700	28.9	7.4	-34	2.91
MW-62-065	5/2/2016	7,090	31.7	7.4	-47	2.24
MW-62-065	9/28/2016	6,550	32.5	7.4	-46	0.79
MW-62-065	12/13/2016	6,360	28.8	7.4	-70	3.04
MW-62-110	2/24/2016	13,700	27.2	7.6	-99	2.69
MW-62-110	5/3/2016	14,800	29.1	7.6	-150	1.63
MW-62-110	9/28/2016	12,200	27.9	8.0	-130	0.28
MW-62-110	12/14/2016	9,330	27.3	7.3	20	1.48
MW-62-190	5/3/2016	20,300	29.3	7.9	-130	1.55
MW-62-190	12/14/2016	18,100	26.8	7.4	-210	0.3
MW-63-065	2/23/2016	7,550	26.3	7.1	-41	1.01
MW-63-065	4/28/2016	8,230	27.4	6.9	76	2.26
MW-63-065	9/30/2016	7,190	26.2	7.1	150	1.56
MW-63-065	12/13/2016	7,010	27.1	7.1	-65	1.71
MW-64BR	2/22/2016	14,600	26.3	7.3	-74	0.35
MW-64BR	5/2/2016	14,900	27.5	7.3	-120	0.2
MW-64BR	9/28/2016	13,600	30.8	7.3	-65	0.77
MW-64BR	12/13/2016	13,900	26.7	7.4	-84	0.5
MW-65-160	2/24/2016	4,040	26.9	7.2	-25	1.18
MW-65-160	5/3/2016	4,060	29.5	7.2	45	1.09
MW-65-160	9/29/2016	6,840	29.8	7.1	10	1.52
MW-65-160	12/6/2016	3,860	28.0	7.2	41	1.37

Table D-3

Field Water Quality Measurements, January 2016 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

Location ID	Sample Date	Specific Conductance (µS/cm)	Temperature (deg C)	pH	ORP (mV)	Dissolved Oxygen (mg/L)
MW-65-225	2/24/2016	12,900	28.8	7.3	-71	0.42
MW-65-225	5/3/2016	17,600	31.9	7.5	4.9	0.15
MW-65-225	9/29/2016	16,500	31.6	7.5	-45	0.3
MW-65-225	12/6/2016	16,300	29.4	7.6	-37	0.26
MW-66-165	4/25/2016	5,300	30.6	7.2	110	3.8
MW-66-165	12/5/2016	3,540	31.3	7.3	61	4.41
MW-66-230	4/25/2016	21,700	29.7	7.8	63	0.7
MW-66-230	12/5/2016	17,900	31.5	7.9	51	0.97
MW-66BR-270	5/4/2016	18,800	30.9	8.1	-350	0.28
MW-67-185	5/3/2016	7,940	34.7	7.2	120	3.95
MW-67-185	12/5/2016	7,600	34.3	7.2	-26	3.54
MW-67-225	5/3/2016	7,830	33.4	7.6	89	1.93
MW-67-225	12/5/2016	6,930	32.2	7.8	-86	2.62
MW-67-260	5/3/2016	19,400	31.8	8.4	12	0.2
MW-67-260	12/5/2016	17,900	31.4	9.7	-180	0.28
MW-68-180	2/24/2016	4,980	28.0	7.4	2.7	5
MW-68-180	5/4/2016	3,840	30.2	7.3	64	6.51
MW-68-180	9/29/2016	4,090	30.2	7.5	77	4.48
MW-68-180	12/6/2016	4,850	28.2	7.5	-55	4.49
MW-68-240	5/4/2016	18,000	33.9	7.2	26	0.18
MW-68-240	12/6/2016	16,900	29.8	7.5	-99	0.4
MW-68BR-280	5/4/2016	23,000	31.9	8.6	-160	0.88
MW-68BR-280	12/6/2016	21,500	28.0	9.1	-210	0.61
MW-69-195	2/24/2016	3,920	31.8	7.3	26	3.39
MW-69-195	4/25/2016	4,540	30.0	7.2	130	3.32
MW-69-195	9/29/2016	3,550	33.3	7.3	81	3.56
MW-69-195	12/6/2016	3,600	31.9	7.4	2.2	4.08
MW-70-105	4/28/2016	3,820	31.5	7.9	11	0.76
MW-70-105	12/14/2016	3,340	32.1	7.7	-85	1.05
MW-70BR-225	4/28/2016	14,700	30.0	7.4	79	0.06
MW-70BR-225	12/14/2016	13,300	30.0	7.3	-57	0.1
MW-71-035	5/3/2016	17,400	29.2	6.6	-49	1.46
MW-71-035	12/14/2016	17,800	28.5	6.7	50	1.06
MW-72-080	2/23/2016	17,300	27.7	7.7	-86	0.65
MW-72-080	4/29/2016	17,600	28.5	7.5	-12	0.46
MW-72-080	9/28/2016	13,100	30.4	7.8	-120	0.61
MW-72-080	12/12/2016	17,000	28.2	7.7	-94	0.69
MW-72BR-200	2/23/2016	17,100	27.3	8.3	-300	0.17
MW-72BR-200	4/28/2016	18,400	27.5	8.0	-150	0.07
MW-72BR-200	9/28/2016	15,800	27.7	8.2	-170	0.15
MW-72BR-200	12/12/2016	16,300	27.3	8.2	-120	0.12
MW-73-080	2/23/2016	11,800	21.7	7.4	-29	3.57
MW-73-080	4/29/2016	6,550	21.6	7.7	100	4.99
MW-73-080	9/28/2016	9,980	26.5	7.3	-100	1.67
MW-73-080	12/12/2016	9,450	27.9	7.4	-80	3.1
MW-74-240	4/27/2016	983	28.1	8.6	-74	0.92
MW-74-240	12/8/2016	1,070	22.3	8.4	150	2.58
OW-03D	12/8/2016	10,100	30.1	8.9	28	0.56
OW-03M	12/8/2016	6,380	29.2	7.9	22	0.97

Table D-3

Field Water Quality Measurements, January 2016 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

Location ID	Sample Date	Specific Conductance (µS/cm)	Temperature (deg C)	pH	ORP (mV)	Dissolved Oxygen (mg/L)
OW-03S	12/8/2016	1,520	29.9	7.8	28	7.02
PE-01	2/3/2016	4,080	16.2	7.3	220	3.41
PE-01	3/2/2016	4,620	20.0	7.1	200	3.89
PE-01	4/27/2016	3,650	19.5	7.5	35	0.18
PE-01	5/10/2016	3,580	25.8	7.3	25	0.68
PE-01	9/8/2016	5,000	23.6	7.3	-5.3	2.04
PE-01	12/6/2016	5,010	24.8	7.6	7.3	3.59
PGE-07BR	12/7/2016	21,200	30.7	7.3	-280	0.07
PGE-08	12/7/2016	20,300	30.6	8.3	-190	0.36
PM-03	12/9/2016	1,340	24.1	7.5	46	8.63
PM-04	12/9/2016	2,210	21.6	8.0	42	0.3
R-19	1/26/2016	1,010	11.1	8.3	120	10.48
R-19	2/24/2016	1,090	12.9	8.1	180	7.96
R-19	4/27/2016	1,010	15.8	7.2	170	8.59
R-19	11/30/2016	1,020	15.7	8.3	180	8.83
R-28	1/26/2016	1,020	11.2	8.3	120	10.4
R-28	2/24/2016	1,090	12.2	8.0	150	8.25
R-28	4/27/2016	994	15.8	8.1	180	8.68
R-28	11/29/2016	1,020	15.4	8.3	170	8.18
R63	1/26/2016	1,010	11.0	8.3	130	10.22
R63	2/23/2016	1,080	13.6	8.1	100	7.67
R63	4/27/2016	996	16.4	8.0	160	7.96
R63	7/6/2016	836	21.1	8.1	-100	8.09
R63	11/29/2016	1,020	16.4	8.3	170	8.21
RRB	2/24/2016	1,090	13.0	8.1	150	7.96
RRB	4/28/2016	1,090	15.6	8.1	72	8.1
RRB	11/30/2016	1,020	15.4	8.4	170	8.59
SW1	1/27/2016	1,160	11.5	7.7	230	7.5
SW1	2/23/2016	1,180	15.7	7.6	94	5.86
SW1	4/28/2016	1,140	18.5	7.6	-10	5.83
SW1	11/30/2016	1,050	11.5	8.3	180	11.56
SW2	1/27/2016	1,050	12.0	7.9	200	8.8
SW2	4/28/2016	1,140	17.7	7.4	-6.6	4.83
SW2	11/30/2016	1,050	11.5	8.3	180	11.89
TW-01	5/3/2016	8,620	31.4	7.0	31	0.56
TW-02D	5/10/2016	7,810	25.8	7.1	87	1.17
TW-02D	12/13/2016	7,340	18.2	7.2	120	2.39
TW-02S	12/13/2016	4,180	17.2	7.7	130	2.41
TW-03D	2/2/2016	7,740	23.1	7.3	200	1.81
TW-03D	3/2/2016	8,660	26.8	7.2	190	2.31
TW-03D	4/27/2016	9,080	26.5	7.2	30	1.14
TW-03D	5/10/2016	7,930	28.2	7.1	4.0	1.24
TW-03D	9/8/2016	7,800	28.2	6.9	12	2.57
TW-03D	12/6/2016	8,280	25.8	7.4	16	3.75

Notes:

--- = data were either not collected, not available or were rejected

°C = degree Celsius.

ORP = oxidation reduction potential, results rounded off to whole point.

Table D-3

Field Water Quality Measurements, January 2016 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California

Location ID	Sample Date	Specific Conductance (µS/cm)	Temperature (deg C)	pH	ORP (mV)	Dissolved Oxygen (mg/L)

mV = millivolts.
mg/L = milligrams per liter.
ORP = oxidation reduction potential, results rounded off to whole point.
µS/cm = microSiemens per centimeter.

All field measurements were collected during groundwater and surface water sampling using a YSI multi-parameter water quality meter, or an in situ multi-parameter water quality meter.

Table D-4

Additional Water Quality Characterization, December 2015 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

Location ID	Sample Date		Oxygen-18 (00/00)	Deuterium (00/00)	Chloride (mg/L)	Bromide (mg/L)	Sulfate (mg/L)	Alkalinity (total) (mg/L)	Total Dissolved Solids (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Boron (mg/L)
MW-09	12/1/2015		--	--	640	ND (1)	220	130	1,700	120	28	--	400	0.59
MW-09	5/3/2016		--	--	720	ND (1)	250	130	1,800	110	27	--	480 J	0.82
MW-09	12/7/2016		--	--	730	ND (1)	240	130	1,700	130	32	--	460	0.73
MW-10	12/1/2015		--	--	510	ND (1)	260	110	1,400	71	11	5.4	430	0.35
MW-10	5/3/2016		--	--	640	ND (1)	270	120	1,700	100	16	--	470	1.1
MW-10	12/7/2016		--	--	510	ND (1)	250	120	1,400	130	18	--	390	0.74
MW-11	12/2/2015	FD	--	--	520	ND (1)	180	86	1,300	100	18	--	310	0.35
MW-11	12/2/2015		--	--	530	ND (1)	190	87	1,400	110	18	--	310	0.35
MW-11	5/3/2016	FD	--	--	530	ND (1)	190	91	1,400	120	19	--	330	0.51
MW-11	5/3/2016		--	--	520	ND (1)	190	91	1,400	120	18	--	310	0.51
MW-11	12/7/2016	FD	--	--	550	ND (1)	190	89	1,300	120	21	--	310 J	0.45
MW-11	12/7/2016		--	--	560	ND (1)	190	91	1,300	130	21	--	410 J	0.49
MW-12	12/2/2015		--	--	1,700	ND (2.5)	450	110	3,900	42	7.4	6	1,500	1
MW-12	12/7/2016		--	--	1,900	1.1	480	120	4,100	40	7.5	--	1,500	1.3
MW-13	12/7/2015		--	--	490	ND (0.5)	140	75	1,200	97	12	--	310	0.39
MW-13	12/8/2016		--	--	600	ND (0.5)	150	71	1,400	110 J	17	--	470	0.41 U
MW-14	12/7/2015		--	--	480	ND (0.5)	100	74	1,100	100	13	--	290	0.38
MW-14	12/8/2016		--	--	610	ND (1)	120	67	1,400	120 J	17	--	310	0.37 U
MW-15	12/9/2015		--	--	420	ND (0.5)	130	76	1,000	97	24	--	240	0.3
MW-15	12/12/2016		--	--	420	ND (0.5)	130	83	1,100	95 J	23	--	190	0.29
MW-16	12/8/2015		--	--	170	ND (0.5 J)	130	98	640	25	4.4	--	190	0.32
MW-17	12/9/2015		--	--	140	ND (0.5)	360	59	860	61	8.2	--	190	0.26
MW-18	12/7/2015		--	--	290	ND (0.5)	91	82	810	82	12	--	180	0.23
MW-18	12/8/2016		--	--	350	ND (0.5)	99	88	880	79 J	13	--	200	0.25 U
MW-19	12/7/2015		--	--	500	ND (0.5)	170	96	1,300	100	15	--	340	0.42
MW-19	12/8/2016		--	--	510	ND (2.5)	160	100	1,200	100 J	16	--	290	0.37 U
MW-20-070	12/8/2015		-7.97973	-61.7815	320	ND (1)	220	100	1,000	54	13	4.8	300	0.52
MW-20-070	12/9/2016		-7.85368	-61.8873	360	ND (0.5)	240	100	1,100	52 J	14 J	5.3	340	0.41
MW-20-100	12/8/2015		-7.60373	-60.1171	510	ND (1)	240	110	1,300	120	20	7	340	0.92
MW-20-100	12/9/2016		-7.9278	-61.9035	500	0.62	250	130	1,300	110 J	19 J	7.2	330	0.83
MW-20-130	12/8/2015	FD	-6.62848	-58.2233	3,100	ND (2.5)	1,100	80	6,600	320	19	25	2,400	2.6
MW-20-130	12/8/2015		-6.41678	-58.0354	3,300	ND (2.5)	1,000	76	7,100	320	19	25	2,400	2.5
MW-20-130	12/9/2016	FD	-6.81648	-60.3119	3,400	ND (2.5)	1,100	79	7,100	250 J	14 J	31	2,700	2.4
MW-20-130	12/9/2016		-6.88176	-60.0955	3,400	ND (2.5)	1,100	77	7,000	260 J	16 J	30	2,600	2.3
MW-21	12/9/2015		--	--	2,300	ND (2.5)	1,900	940	7,500	210	55	--	2,700	4.2
MW-21	12/14/2016		--	--	3,100	3.4	2,600	1,000	8,800	210 J	76	--	4,200	6.5
MW-22	12/3/2015		-10.76	-85.84	7,400	ND (5)	2,100	800	15,000	850	260	29	3,600	4
MW-22	12/6/2016		--	--	6,700	ND (5)	1,900	820	14,000	680	220	--	4,300	2.4
MW-23-060	12/3/2015		--	--	5,800	ND (5)	650	53	10,000	1,000	4.6	--	3,100	0.96
MW-23-060	12/14/2016		--	--	5,800	ND (5)	670	19	9,700	920 J	2.4	--	3,100	0.72
MW-23-080	12/3/2015		--	--	5,600	ND (5)	910	39	11,000	930	0.94	--	3,400	0.97
MW-23-080	12/14/2016	FD	--	--	5,800	ND (5)	970	45	9,600	790 J	0.55	--	3,300	0.83
MW-23-080	12/14/2016		--	--	5,700	ND (5)	970	48	9,600	850 J	0.7	--	3,200	0.82
MW-24A	12/6/2016		--	--	--	--	--	300	1,000	--	--	--	--	--
MW-24B	12/6/2016		--	--	--	--	--	51	11,000	--	--	--	--	--
MW-24BR	12/2/2015		--	--	4,700	ND (2.5)	470	24	8,300	150	4.2	--	3,100	2.6

Table D-4

Additional Water Quality Characterization, December 2015 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

Location ID	Sample Date		Oxygen-18 (00/00)	Deuterium (00/00)	Chloride (mg/L)	Bromide (mg/L)	Sulfate (mg/L)	Alkalinity (total) (mg/L)	Total Dissolved Solids (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Boron (mg/L)
MW-24BR	12/7/2016		--	--	4,800	ND (0.5)	460	46	7,900	120	3.3	--	3,200	2.5
MW-25	12/7/2015		-8.99177	-67.0607	340	ND (0.5)	150	140	1,000	110	21	7.9	230	0.42
MW-25	12/8/2016		-8.78942	-65.8821	380	ND (0.5)	180	130	1,100	110 J	22	8.4	220	0.41 U
MW-26	12/8/2015	FD	-7.93156	-65.0305	870	ND (1)	520	110	2,500	140	30	14	640	0.81
MW-26	12/8/2015		-8.19913	-65.4939	890	ND (1)	500	110	2,400	140	32	13	640	0.86
MW-26	12/8/2016	FD	-7.98162	-65.5157	880	ND (2.5)	520	120	2,500	160 J	42	13	680	1.1
MW-26	12/8/2016		-7.9186	-65.4433	890	ND (2.5)	520	120	2,400	160 J	41	13	650	1.1
MW-27-020	12/3/2015		--	--	92	ND (0.5)	250	150	680	74	22	--	100	0.13
MW-27-020	12/6/2016		--	--	96	ND (0.5)	250	140	680	78	27	--	100	0.1
MW-27-060	12/3/2015	FD	--	--	75	ND (0.5)	150	250	600	88	21	--	92	0.17
MW-27-060	12/3/2015		--	--	74	ND (0.5)	150	250	600	86	21	--	92	0.17
MW-27-060	12/6/2016	FD	--	--	79	ND (0.5)	150	240	630	76 J	15	--	96	0.21
MW-27-060	12/6/2016		--	--	80	ND (0.5)	150	250	620	72 J	14	--	95	0.23
MW-27-085	12/3/2015		--	--	2,700	ND (2.5)	910	270	6,300	320	56	--	2,000	1.3
MW-27-085	12/6/2016		--	--	2,700	ND (2.5)	900	260	5,400	210 J	37	--	1,900	1.2
MW-28-025	12/2/2015		--	--	96	ND (0.5)	260	190	750	92	26	--	110	0.13
MW-28-025	12/8/2016		--	--	110	ND (0.5)	280	210	780	98 J	30	--	120	0.23 U
MW-28-090	12/2/2015		--	--	1,700	ND (2.5 J)	520	270	4,100	200	33	--	1,100	0.67
MW-28-090	12/8/2016		--	--	1,100	ND (2.5)	340	410	2,700	150 J	31	--	840	0.72
MW-29	12/1/2015		--	--	300	ND (0.5)	210	520	1,400	90	44	--	460	0.69
MW-29	12/8/2016		--	--	270	ND (2.5)	470	440	1,600	160 J	63	--	320	0.44
MW-30-030	12/3/2015		--	--	2,700	ND (2.5)	2,600	1,600	9,300	220	160	--	3,300	3.3
MW-30-030	12/6/2016		--	--	3,000	ND (1)	3,700	2,000	12,000	120 J	110	--	5,000	3
MW-30-050	12/3/2015	FD	-12.79	-102.79	94	ND (0.5)	190	190	660	77	18	--	120	0.19
MW-30-050	12/3/2015		-13.31	-103.4	95	ND (0.5)	190	180	660	77	18	--	170	0.19
MW-30-050	12/6/2016		-12.8028	-101.679	90	ND (0.5)	210	190	670	82 J	19	--	100	0.16 U
MW-31-060	12/7/2015		-8.2946	-64.5767	620	ND (0.5)	200	92	1,600	100	17	5.4	470	0.5
MW-31-060	12/9/2016	FD	-8.65932	-66.0943	760	ND (1)	220	93	1,700	120 J	22 J	6.6	470	0.42
MW-31-060	12/9/2016		-8.48888	-66.636	750	ND (0.5)	210	91	1,700	120 J	20 J	6.2	470	0.42
MW-31-135	12/7/2015		-9.87022	-75.9091	3,500	ND (2.5)	450	35	6,900	370	21	--	2,500	1.5
MW-31-135	12/9/2016		-9.57103	-75.9886	3,400	ND (2.5)	490	38	6,700	340 J	23 J	--	2,400	1.3
MW-32-020	12/3/2015	FD	--	--	10,000	ND (10)	6,700	2,300	27,000	560	390	--	8,700	7.1
MW-32-020	12/3/2015		--	--	10,000	ND (10)	6,500	2,300	26,000	620	430	--	8,100	6.8
MW-32-020	12/6/2016		--	--	9,800	3.2	8,200	2,800	27,000	350	330	--	10,000	5.9
MW-32-035	12/3/2015		-11.18	-87.49	2,800	ND (2.5)	1,200	610	7,400	450	220	18	1,900	1.2
MW-32-035	12/6/2016		-10.7781	-87.0352	2,800	ND (2.5)	1,100	630	6,700	370	210	20	1,800	0.99
MW-33-040	12/1/2015		--	--	4,200	ND (2.5)	1,600	460	10,000	90	120	--	4,000	3
MW-33-040	12/8/2016		-8.92289	-70.7913	4,600	1.5	1,700	470	10,000	67 J	100	--	3,700	3
MW-33-090	12/1/2015		-10.18	-76.1	2,700	ND (2.5 J)	690	110	5,800	330	25	--	2,000	1.1
MW-33-090	12/8/2016		-9.3506	-75.3833	2,800	ND (0.5)	720	110	5,500	280 J	26	--	1,900	1.3
MW-33-150	12/1/2015		-10.79	-77.95	4,500	ND (2.5 J)	740	55	8,100	430	48	--	3,200	1.2
MW-33-150	12/8/2016		-9.95151	-77.3639	5,100	ND (2.5)	770	58	8,600	370 J	41	--	3,000	1.3
MW-33-210	12/1/2015		-11.66	-83.37	6,400	ND (2.5)	1,100	55	11,000	650	69	--	4,100	1.6
MW-33-210	12/8/2016		-10.4696	-82.8148	6,600	ND (2.5)	1,100	58	11,000	590 J	56	--	4,000	1.6
MW-34-055	12/3/2015		-13.02	-102.02	83	ND (0.5)	230	150	630	80	25	4.7	86	0.19
MW-34-055	12/6/2016		-12.4446	-101.069	89	ND (0.5)	230	150	680	77 J	26	5.6	100	0.11 U

Table D-4

Additional Water Quality Characterization, December 2015 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

Location ID	Sample Date		Oxygen-18 (00/00)	Deuterium (00/00)	Chloride (mg/L)	Bromide (mg/L)	Sulfate (mg/L)	Alkalinity (total) (mg/L)	Total Dissolved Solids (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Boron (mg/L)
MW-34-080	12/3/2015		-11.53	-92.07	1,500	ND (2.5)	510	300	3,600	220	48	--	1,000	0.83
MW-34-080	12/6/2016	FD	-10.9343	-88.0238	1,900	ND (2.5)	620	290	4,200	230 J	47	16	1,300	0.98
MW-34-080	12/6/2016		-11.3322	-88.5807	2,000	ND (2.5)	630	270	4,300	220 J	47	15	1,300	0.98
MW-34-100	12/3/2015	FD	-10.16	-78.93	5,200	ND (5)	1,000	94	9,600	160	7.1	31	3,800	2.8
MW-34-100	12/3/2015		-10.1	-79.04	5,100	ND (5)	980	100	9,900	150	6.7	30	3,700	2.7
MW-34-100	12/6/2016		-10.6026	-81.5735	4,700	0.59	1,200	130	8,900	140 J	7.6	33	3,600	2.3
MW-34-100	12/6/2016	*	-11.2176	-86.8470	--	--	--	--	--	--	--	--	--	--
MW-35-060	12/7/2015		-9.41288	-71.6525	2,000	ND (2.5)	320	72	4,200	280	29	--	1,300	0.84
MW-35-060	12/9/2016		-9.21068	-72.4801	2,100	ND (0.5)	350	80	4,400	270 J	33 J	--	1,300	0.76
MW-35-135	12/7/2015		-10.3075	-80.0206	3,100	ND (2.5)	700	48	6,700	300	29	--	2,200	0.84
MW-35-135	12/9/2016	FD	-10.1602	-79.937	3,100	ND (2.5)	750	50	6,400	260 J	30 J	--	2,000	0.74
MW-35-135	12/9/2016		-10.2048	-80.139	3,200	ND (2.5)	750	48	6,000	260 J	31 J	--	2,100	0.77
MW-36-020	12/8/2015		--	--	1,600	ND (2.5)	2,500	1,500	7,800	210	210	--	2,500	2.3
MW-36-020	12/7/2016		--	--	1,400	ND (1)	2,300	1,300	6,700	160	190	--	1,900	1.9
MW-36-040	12/8/2015		--	--	99	ND (0.5)	140	300	710	51	11	--	180	0.41
MW-36-040	12/7/2016		--	--	120	ND (0.5)	180	260	750	50	12	--	190	0.32
MW-36-050	12/8/2015		--	--	99	ND (0.5)	190	190	680	90	19	--	98	0.32
MW-36-050	12/7/2016		--	--	94	ND (0.5)	190	220	670	88	20	--	93	0.18
MW-36-070	12/8/2015		--	--	80	ND (0.5)	190	170	600	58	12	--	130	0.26
MW-36-070	12/7/2016		--	--	83	ND (0.5)	200	180	630	53	11	--	130	0.19
MW-36-090	12/8/2015		-12.7494	-102.546	79	ND (0.5)	180	190	650	5.7	0.67	--	230	0.31
MW-36-090	12/7/2016		-12.8825	-102.093	97	ND (0.5)	210	180	680	10	1.6	--	240	0.21
MW-36-100	12/8/2015		-11.8973	-93.4661	1,900	ND (2.5)	620	260	4,600	170	25	--	1,600	1.2
MW-36-100	12/7/2016		-11.8676	-94.8022	2,100	0.68	590	230	4,300	140	20	--	1,400	0.97
MW-37D	12/7/2015		--	--	4,700	ND (5)	640	31	8,400	440	20	--	3,300	1.9
MW-37D	12/8/2016		--	--	4,900	ND (2.5)	660	30	8,900	380 J	19	--	3,300	1.8
MW-37S	12/8/2015		--	--	1,700	ND (2.5)	290	50	3,500	210	24	--	1,200	0.92
MW-37S	12/8/2016		-9.45	-72.7	1,900	ND (2.5)	310	51	3,800	190 J	24	--	1,400	0.84
MW-38D	12/1/2015		--	--	7,200	ND (5)	700	29	13,000	440	8.2	--	5,100	2.7
MW-38D	12/7/2016		--	--	7,800	ND (2.5)	740	29	14,000	390	6.2	--	4,900	2.7 J
MW-38S	12/1/2015		--	--	260	ND (0.5)	160	180	880	27	5.3	--	330	0.99
MW-38S	12/7/2016	FD	--	--	240	0.6	160	190	840	21	4.1	--	310	0.89
MW-38S	12/7/2016		--	--	250	0.64	160	190	890	22	4.1	--	300	0.86
MW-39-050	12/4/2015		--	--	120	ND (0.5)	200	190	710	58	18	--	170	0.2
MW-39-050	12/7/2016		--	--	93	ND (0.5)	210	180	640	55	16	--	150	0.19
MW-39-060	12/4/2015	FD	--	--	160	ND (0.5)	200	200	780	36	10	--	260	0.32
MW-39-060	12/4/2015		--	--	160	ND (0.5)	210	200	780	36	10	--	260	0.34
MW-39-060	12/7/2016		--	--	110	ND (0.5)	210	200	680	35	11	--	220 J	0.23
MW-39-070	12/4/2015		-12.45	-99.49	290	ND (0.5)	250	240	1,200	32	6.7	--	390	0.34
MW-39-070	12/7/2016		-12.8252	-101.647	270	ND (0.5)	250	240	1,100	38	8.7	--	370	0.33
MW-39-080	12/4/2015		-12.96	-98.42	690	ND (1)	340	270	1,900	43	8.7	--	550	0.47
MW-39-080	12/7/2016		-12.7539	-100.168	380	ND (0.5)	270	260	1,300	42	9	--	530	0.44
MW-39-100	12/4/2015		-12.96	-99.67	4,600	ND (2.5)	1,300	270	9,300	330	51	--	2,100	1.5
MW-39-100	12/7/2016		-10.8632	-84.1248	4,800	ND (2.5)	1,300	250	8,800	430	52	--	3,200	2.2
MW-40D	12/7/2015	FD	--	--	4,800	ND (5)	640	56	8,900	450	39	--	3,300	2.1
MW-40D	12/7/2015		--	--	5,000	ND (5)	670	61	9,000	420	40	--	3,300	2.1

Table D-4

Additional Water Quality Characterization, December 2015 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

Location ID	Sample Date		Oxygen-18 (00/00)	Deuterium (00/00)	Chloride (mg/L)	Bromide (mg/L)	Sulfate (mg/L)	Alkalinity (total) (mg/L)	Total Dissolved Solids (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Boron (mg/L)
MW-41D	12/7/2015		--	--	6,900	ND (5)	730	45	13,000	490	34	--	4,400	1.9
MW-41D	12/8/2016		--	--	7,300	ND (2.5)	780	41	12,000 J	410 J	27	--	4,800	2
MW-41M	12/7/2015	FD	--	--	4,800	ND (5)	540	37	8,800	430	31	--	3,000	1.6
MW-41M	12/7/2015		--	--	4,700	ND (5)	530	35	9,400	470	32	--	3,200	1.6
MW-41M	12/8/2016		--	--	5,100	ND (2.5)	560	39	8,800	410 J	31	--	3,000	1.5
MW-41S	12/7/2015		--	--	1,600	ND (2.5)	280	56	3,300	140	16	--	1,200	0.89
MW-41S	12/8/2016		--	--	1,700	ND (1)	310	57	3,300	140 J	19	--	1,100	0.94
MW-42-030	12/3/2015		-12.37	-95.76	--	--	--	--	--	--	--	--	--	--
MW-42-030	12/6/2016		-12.0212	-96.8008	--	--	--	--	--	--	--	--	--	--
MW-42-055	12/3/2015		-12.39	-100.03	95	ND (0.5)	190	240	720	7.3	1.8	--	290	0.27
MW-42-055	12/6/2016		-12.6162	-102.947	81	ND (0.5)	190	220	680	6.2 J	1.8	--	260	0.2
MW-42-065	12/3/2015		-12.55	-98.17	1,400	ND (2.5)	490	400	3,600	140	31	--	1,200	0.93
MW-42-065	12/6/2016	FD	-12.6097	-98.5784	1,000	ND (0.5)	380	390	2,600	71 J	16	--	1,000	0.64
MW-42-065	12/6/2016		-12.3166	-98.3368	1,100	ND (0.5)	380	390	2,700	72 J	15	--	1,100	0.69
MW-43-025	12/8/2015		--	--	110	ND (0.5)	290	260	880	100	43	--	120	0.2
MW-43-025	12/7/2016		--	--	110	ND (0.5)	290	260	870	100	43	--	98	0.17 U
MW-43-075	12/2/2015		--	--	2,600	ND (2.5)	1,200	550	6,700	420	140	--	2,000	0.85
MW-43-075	12/9/2016		--	--	3,100	ND (2.5)	950	500	6,300	320 J	150 J	--	2,000	0.95
MW-43-090	12/2/2015		--	--	4,800	ND (2.5)	920	180	8,800	360	74	--	3,300	2.1
MW-43-090	12/9/2016		--	--	5,700	ND (2.5)	1,000	200	10,000	390 J	80 J	--	3,400	1.9
MW-44-070	12/4/2015		-13.34	-104.01	120	ND (0.5)	200	180	710	24	4	--	240	0.28
MW-44-070	12/7/2016		-12.0253	-100.557	250	ND (0.5)	230	220	970	43	7.6	--	300	0.3
MW-44-115	12/4/2015		-11.1	-82.46	3,300	ND (2.5)	810	75	6,700	120	6	19	2,700	1.9
MW-44-115	12/7/2016		-10.1688	-81.7723	3,400	1.1	850	81	6,300	89	4.4	--	2,300	1.8
MW-44-125	12/4/2015	FD	-11.36	-91.78	2,000	ND (2.5)	410	150	4,000	74	6	--	1,700	1.2
MW-44-125	12/4/2015		-11.9	-88.3	2,700	ND (2.5)	520	130	5,300	59	5.4	--	1,200	0.89
MW-44-125	12/7/2016	FD	-10.2988	-84.9745	3,300	0.76	580	120	5,500	79	5	--	2,300	1.7
MW-44-125	12/7/2016		-10.4135	-85.2032	3,300	0.77	580	110	5,800	77	5	--	2,100	1.6
MW-46-175	12/2/2015		-10.5	-78.89	5,700	ND (5)	800	44	11,000	140	3.1	--	4,300	2.5
MW-46-175	12/8/2016		-10.3138	-79.1672	6,400	ND (2.5)	860	45	10,000	100 J	2.7	--	4,200	2.2
MW-46-205	12/2/2015		--	--	7,400	ND (5)	830	45	13,000 J	140	3	--	4,800	3.7
MW-46-205	12/8/2016		--	--	7,700	ND (2.5)	880	47	13,000	120 J	2.8	--	5,200	3.6
MW-47-055	12/2/2015		-9.06	-69.56	1,200	ND (1)	220	68	2,600	170	23 J	--	700	0.49
MW-47-055	12/8/2016		-8.98778	-70.7655	1,500	ND (2.5)	280	63	3,200	200 J	31	--	840	0.77
MW-47-115	12/2/2015		-10.22	-78.66	4,300	ND (2.5)	730	53	8,200	230	19	--	1,800	0.66
MW-47-115	12/8/2016		-9.96314	-79.1768	4,800	ND (2.5)	780	56	8,500	380 J	35	--	2,900	1.4
MW-48	12/4/2015		--	--	6,100	ND (5)	560	26	10,000	450	38	--	3,500	1.3
MW-48	12/14/2016		--	--	6,200	ND (2.5)	580	32	11,000 J	330 J	29	--	4,700	1.1
MW-49-135	12/1/2015		-11	-80.29	4,000	ND (2.5)	750	58	7,700	370	36	--	2,800	0.9
MW-49-135	12/8/2016	FD	-9.9675	-79.8806	4,300	ND (2.5)	790	62	8,100	330 J	31	--	2,800	0.99
MW-49-135	12/8/2016		-9.84245	-78.6502	4,400	ND (2.5)	820	61	8,200	330 J	31	--	2,800	0.99
MW-49-275	12/1/2015		-10.97	-80.93	8,100	ND (5)	1,300	35	15,000	260	6.6	--	5,900	2.6
MW-49-275	12/8/2016		-13.0496	-103.81	9,000	ND (2.5)	1,400	38	15,000	240 J	5.2	--	6,000	2.7
MW-49-365	12/1/2015	FD	-11.37	-81.1	13,000	ND (10)	1,100	33	22,000	440	10	--	9,300	4.4
MW-49-365	12/1/2015		-11	-81.14	13,000	ND (10)	1,100	33	22,000	26	5.2	--	9,300	0.93
MW-49-365	12/8/2016		-10.0002	-79.9299	15,000	ND (2.5)	1,200	39	23,000	350 J	11	--	8,600	5.5

Table D-4

Additional Water Quality Characterization, December 2015 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California

Location ID	Sample Date		Oxygen-18 (00/00)	Deuterium (00/00)	Chloride (mg/L)	Bromide (mg/L)	Sulfate (mg/L)	Alkalinity (total) (mg/L)	Total Dissolved Solids (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Boron (mg/L)
MW-50-095	12/8/2015		--	--	1,400	ND (1)	270	56	3,000	120	12	--	1,000	0.93
MW-50-095	12/9/2016		--	--	1,600	ND (0.5)	290	59	3,200	120 J	13 J	--	1,100	0.79
MW-50-200	12/7/2015		--	--	6,400	ND (5)	850	37	13,000	580	29	39	4,600	2.1
MW-50-200	12/9/2016		--	--	7,800	ND (2.5)	970	37	13,000 J	570 J	30 J	--	4,700	1.9
MW-51	12/8/2015		--	--	3,400	ND (2.5)	660	92	6,500	280	16	27	2,400	1.7
MW-51	12/9/2016		--	--	4,100	ND (2.5)	350	84	6,900	300 J	20 J	--	2,600	1.6
MW-52D	12/2/2015		--	--	7,100	ND (5)	900	56	11,000	350	20	--	4,800	2.8
MW-52D	12/5/2016		--	--	7,500	ND (5)	940	66	12,000	320	78	--	3,300	1.4
MW-52M	12/2/2015		--	--	5,000	ND (2.5)	630	85	9,800	430	39	--	3,200	2.1
MW-52M	12/5/2016		--	--	5,500	ND (2.5)	660	100	8,900	270	15	--	3,200	2.2
MW-52S	12/2/2015		--	--	2,300	ND (2.5)	940	810	5,900	360	4.2	--	1,600	3.1
MW-52S	12/5/2016	FD	--	--	2,600	ND (2.5)	1,000	920	6,200	370	160 J	--	1,700	0.6 J
MW-52S	12/5/2016		--	--	2,500	ND (2.5)	1,100	930	6,500	340	27 J	--	1,700	1.6 J
MW-53D	12/2/2015		--	--	8,600	ND (5)	1,200	37	16,000	370	17	--	5,700	3.4
MW-53D	12/5/2016		--	--	9,600	ND (5)	1,200	35	14,000 J	280	12	--	6,100	3.3
MW-53M	12/2/2015		--	--	6,200	ND (5)	760	49	12,000	440	32	--	4,100	2.1
MW-53M	12/5/2016		--	--	1,500	ND (5)	380	230	3,300	230	27	--	2,400	1.1
MW-54-085	12/9/2015	FD	--	--	3,100	ND (2.5)	540	150	6,000	170	77	--	2,000	1.1
MW-54-085	12/9/2015		--	--	3,270 J	ND (5 J)	598 J	160	6,280 J	180	94.6	--	2,100	1.26
MW-54-085	12/15/2016		--	--	3,380	--	570	140	6,240	177	100	--	2,060	1.2
MW-54-140	12/9/2015		--	--	4,000	ND (5 J)	586 J	96	7,590 J	140	14.6	--	2,800	1.82
MW-54-140	12/15/2016		--	--	4,350	--	492	93.9	7,520	144	14.7	--	2,730	1.67
MW-54-195	12/9/2015		--	--	6,300	ND (10 J)	947 J	55	11,600 J	134	4.25	--	4,550	2.85
MW-54-195	12/15/2016	FD	--	--	5,820	--	927 U	56.8	10,900	126	5.38	--	4,470	2.57
MW-54-195	12/15/2016		--	--	6,450	--	933	56.2	11,400	127	5.49	--	4,480	2.63
MW-55-045	12/7/2015		--	--	289 J	ND (0.5 J)	76.9 J	160	800	39	8.86	--	260	0.6
MW-55-045	12/15/2016		--	--	326	--	97.4 U	149	775	35.8	9.81	--	243	0.512
MW-55-120	12/7/2015		--	--	2,420 J	ND (5 J)	289 J	71.4 J	4,690 J	87	1.5	--	1,800	1.7
MW-55-120	12/15/2016		--	--	2,720	--	263	60.7	4,150	76.3	1.77	--	1,720	1.49
MW-56D	12/9/2015		--	--	7,300 J	ND (10 J)	1,320 J	120	15,000 J	446	84.1	--	5,000	2.8
MW-56D	12/14/2016		--	--	7,440	--	1,340	119	13,800	411	81.4	--	4,710	2.8
MW-56M	12/9/2015		--	--	4,600	ND (5 J)	954 J	460	9,660 J	453	125	--	3,370	1.95
MW-56M	12/14/2016		--	--	4,420	--	889	437	9,240	379	110	--	2,960	1.86
MW-56S	12/9/2015		--	--	1,210 J	ND (2.5 J)	1,000	720 J	4,100	265	87.6	--	1,340	2.6
MW-56S	12/14/2016		--	--	1,250	--	1,240	803	4,510	283	103	--	1,250	2.3
MW-57-070	12/4/2015		--	--	450	ND (1)	91	100	1,200	260	17	--	84	0.25
MW-57-070	12/13/2016		--	--	620	ND (2.5)	88	88	1,600	300 J	22	--	97	0.16
MW-57-185	12/4/2015		--	--	6,500	ND (5)	720	19	11,000	390	3	--	4,100	2.8
MW-57-185	12/13/2016		--	--	6,100	ND (2.5)	750	24	11,000	300 J	3	--	3,900	2.6
MW-58BR	12/7/2015		--	--	2,600	ND (2.5)	490	43	5,200	540	26	--	1,500	1.1
MW-58BR	12/13/2016		--	--	2,700	ND (2.5)	520	45	5,100	440 J	26	--	1,300	1
MW-59-100	12/3/2015	FD	--	--	3,400	ND (5)	650	100	6,900	920	21	--	1,800	1.3
MW-59-100	12/3/2015		--	--	3,500	ND (5)	640	100	6,900	900	20	--	1,700	1.3
MW-59-100	12/7/2016	FD	--	--	3,000	ND (5)	610	120	6,100	660	20	--	1,400	1.5
MW-59-100	12/7/2016		--	--	2,900	ND (5)	610	120	6,200	620	19	--	1,300	1.4
MW-60-125	12/4/2015		--	--	2,700	ND (2.5)	460	53	5,600	570	27	26	1,400	1

Table D-4

Additional Water Quality Characterization, December 2015 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

Location ID	Sample Date		Oxygen-18 (00/00)	Deuterium (00/00)	Chloride (mg/L)	Bromide (mg/L)	Sulfate (mg/L)	Alkalinity (total) (mg/L)	Total Dissolved Solids (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Boron (mg/L)
MW-60-125	12/14/2016		--	--	2,800	ND (5)	470	57	5,400	590 J	26	--	1,400	0.86
MW-60BR-245	12/4/2015		--	--	5,900	ND (5)	780	22	11,000	470	6.3	--	3,900	2.5
MW-60BR-245	12/14/2016		--	--	6,000	ND (2.5)	800	24	11,000	370 J	5.6	--	3,900	2.5
MW-61-110	12/4/2015		--	--	5,700	ND (5)	690	41	11,000	760	20	--	3,300	2.1
MW-61-110	12/13/2016		--	--	5,600	ND (5)	730	42	9,600	750 J	18	--	3,100	1.8
MW-62-065	12/3/2015		--	--	1,800	ND (2.5)	410	110	3,500	230	21	--	1,100	0.66
MW-62-065	12/13/2016		--	--	1,700	ND (2.5)	430	110	3,800	190 J	26	--	1,100	0.72
MW-62-110	12/4/2015		--	--	2,600	ND (2.5)	480	96	5,100	160	5.8	--	2,000	1.5
MW-62-110	12/14/2016		--	--	2,700	ND (1)	550	90	5,200	150 J	6.3	--	1,900	1.4
MW-62-190	12/4/2015		--	--	6,200	ND (5)	740	50	10,000	410	13	--	4,400	2.5
MW-62-190	12/14/2016		--	--	6,300	ND (2.5)	730	70	11,000	320 J	12	--	4,700	2.4
MW-63-065	12/4/2015		--	--	2,400	ND (2.5)	600	190	4,300	240	23	--	1,500	0.92
MW-63-065	12/13/2016		--	--	1,800	ND (2.5)	590	220	4,100	170 J	21	--	1,200	0.78
MW-64BR	12/7/2015		--	--	4,300	ND (2.5)	580	57	9,100	440	17	--	3,000	2
MW-64BR	12/13/2016	FD	--	--	4,500	ND (2.5)	600	67	7,600	350 J	19	--	2,700	1.8
MW-64BR	12/13/2016		--	--	4,400	ND (2.5)	610	67	7,800	340 J	18	--	2,700	1.7
MW-65-160	12/2/2015		--	--	840	ND (1)	380	130	2,200	220	26	--	520	0.86
MW-65-160	12/6/2016		--	--	950	ND (2.5)	420	120	2,400	220 J	28	--	540	0.98
MW-65-225	12/2/2015		--	--	4,600	ND (2.5)	820	61	9,100	520	22	--	3,000	2.9
MW-65-225	12/6/2016		--	--	5,400	ND (2.5)	890	52	9,800	440	19	--	3,700	2.6
MW-66-165	12/2/2015		--	--	960	ND (2.5)	450	88	2,600	310	51	--	550	0.61
MW-66-165	12/5/2016		--	--	1,000	ND (2.5)	450	87	2,400	260	47	--	450 J	0.6
MW-66-230	12/3/2015		--	--	6,000	ND (5)	1,100	33	11,000	480	7.1	--	3,900	2.4
MW-66-230	12/5/2016		--	--	5,800	ND (5)	1,200	33	10,000	410 J	5.3 J	--	4,100	2.2
MW-66BR-270	12/9/2015		--	--	5,200	ND (5)	220	ND (5)	8,000	300	18	--	3,900	1.6
MW-66BR-270	12/15/2016		--	--	1,600	ND (0.5)	68	29	2,800	74 J	2.3	--	770	1.1
MW-67-185	12/2/2015		--	--	1,800	4.5	490	93	4,700	470	77	--	990	0.77
MW-67-185	12/5/2016		--	--	2,100	7	510	85	4,500	470	81	--	960	0.75
MW-67-225	12/2/2015		--	--	1,500	ND (2.5)	1,100	140	4,600	95	4.5	--	1,800	0.73
MW-67-225	12/5/2016		--	--	1,600	ND (2.5)	1,100	140	4,500	130	6.3	--	1,500	1.3
MW-67-260	12/2/2015		--	--	5,600	ND (5)	760	29	10,000	360	4.6	--	4,000	3.1
MW-67-260	12/5/2016	FD	--	--	6,200	ND (5)	800	33	10,000	290	3	--	3,900	2.6
MW-67-260	12/5/2016		--	--	6,200	ND (5)	800	35	10,000	290	2.7	--	3,900	2.5
MW-68-180	12/2/2015		--	--	790	ND (2.5)	1,100	83	3,300	430	43	--	570	0.45
MW-68-180	12/6/2016		--	--	900	ND (2.5)	1,200	86	3,500	440 J	51	--	590	0.51
MW-68-240	12/2/2015		--	--	5,100	ND (5)	850	58	9,900	650	23	--	3,300	2.5
MW-68-240	12/6/2016		--	--	5,600	ND (2.5)	920	60	11,000	250 J	11	--	3,600	0.93
MW-68BR-280	12/3/2015		--	--	7,400	ND (5)	700	16	13,000	480	5.3	--	4,600	2.7
MW-68BR-280	12/6/2016		--	--	7,400	ND (2.5)	710	19	13,000	360	4	--	4,900	2.2
MW-69-195	12/4/2015		--	--	630	ND (1)	590	220	2,200	130	11	--	650	1.7
MW-69-195	12/6/2016		--	--	560	0.73	630	230	2,200	94	8.2	--	810	1.6
MW-70-105	12/7/2015		--	--	950	ND (1)	260	87	2,100	110	10	--	690	0.71
MW-70-105	12/14/2016		--	--	910	0.51	260	93	1,900	96 J	9.4	--	630	0.69
MW-70BR-225	12/7/2015		--	--	4,300	ND (2.5)	760	41	8,400	750	29	--	2,600	1.7
MW-70BR-225	12/14/2016	FD	--	--	4,400	ND (5)	810	44	7,400	680 J	29	--	2,400	1.6
MW-70BR-225	12/14/2016		--	--	4,400	ND (5)	800	45	8,400	720 J	31	--	2,400	1.7

Table D-4

Additional Water Quality Characterization, December 2015 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California

Location ID	Sample Date	Oxygen-18 (00/00)	Deuterium (00/00)	Chloride (mg/L)	Bromide (mg/L)	Sulfate (mg/L)	Alkalinity (total) (mg/L)	Total Dissolved Solids (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Boron (mg/L)
MW-71-035	12/4/2015	--	--	5,500	ND (5)	1,200	300	11,000	1,100	110	--	3,100	3.1
MW-71-035	12/14/2016	--	--	4,700	ND (5)	1,000	220	8,400	730 J	57	--	2,600	2.2
MW-72-080	12/7/2015	--	--	5,200	ND (5)	690	38	10,000 J	430	8.4	--	3,500	2.4
MW-72-080	12/12/2016	--	--	5,700	ND (2.5)	740	41	10,000	340 J	7.9 J	--	3,200	2.1
MW-72BR-200	12/8/2015	--	--	5,200	ND (5)	660	22	9,000	300	2.3	--	3,300	2
MW-72BR-200	12/12/2016	--	--	5,000	ND (2.5)	640	26	8,400	240 J	2.5	--	3,100	2.1
MW-73-080	12/8/2015	--	--	3,500	ND (2.5)	440	90	6,500	540	31	--	2,100	1.1
MW-73-080	12/12/2016 FD	--	--	3,400	ND (2.5)	420	85	5,900	430 J	32	--	1,900	1.2
MW-73-080	12/12/2016	--	--	3,400	ND (2.5)	420	80	6,000	410 J	32	--	1,700	1.1
MW-74-240	12/7/2015	--	--	120	ND (0.5)	71	170	550	5.3	1	--	75	0.15
MW-74-240	12/8/2016	--	--	120	ND (0.5)	75	170	500	18 J	2.3	--	180	0.29
OW-03D	12/7/2015	--	--	2,900	ND (2.5)	420	33	5,600	220	15	--	2,000	1.4
OW-03D	12/8/2016	--	--	3,100	ND (1)	440	34	5,300	200 J	17	--	1,900	1.5
OW-03M	12/7/2015	--	--	1,600	ND (2.5)	310	51	3,500	120	9.6	--	1,300	1.2
OW-03M	12/8/2016	--	--	1,700	ND (0.5)	330	54	3,500	100 J	9	--	1,200	1.1
OW-03S	12/7/2015 FD	--	--	330	ND (0.5)	74	72	830	69	10	--	190	0.21
OW-03S	12/7/2015	--	--	320	ND (0.5)	77	74	790	71	11	--	190	0.22
OW-03S	12/8/2016	--	--	360	ND (0.5)	79	75	840	69 J	12	--	210	0.21 U
PE-01	12/1/2015	--	--	970	--	350	210	2,400	120 J	23 J	--	830	--
PE-01	12/7/2015	--	--	990	ND (1)	360	--	2,500	--	--	--	--	--
PE-01	1/6/2016	--	--	1,000	--	370	210	2,400	84	13	--	810	--
PE-01	2/2/2016	--	--	980	--	350	200	2,600	100	23	--	670 J	--
PE-01	3/2/2016	--	--	1,000	--	370	200	2,500	120	26	--	820 J	--
PE-01	4/27/2016	--	--	830	--	340	210	2,100	120	24	--	670	--
PE-01	5/10/2016	--	--	790	--	340	210	2,000	93	22	--	260	--
PE-01	6/7/2016	--	--	910	--	340	230	2,200	120 J	26	--	680	--
PE-01	7/6/2016	--	--	990	--	360	220	2,400	180	39	--	690	--
PE-01	8/3/2016	--	--	1,000	--	350	230	2,400	140	32	--	720	--
PE-01	9/8/2016	--	--	1,100	--	380	230	2,600	120 J	28	--	750	--
PE-01	10/6/2016 FD	--	--	1,200	--	400	240	2,700	--	--	--	--	--
PE-01	10/6/2016	--	--	1,200	--	400	240	2,700	--	--	--	--	--
PE-01	11/2/2016	--	--	1,200	--	380	230	2,700	120	28	--	830	--
PE-01	12/6/2016	--	--	1,100	--	380	220	2,400	120 J	28	--	800 J	--
PGE-07BR	12/2/2015	--	--	7,600	ND (25)	420	ND (5)	12,000	660	16	--	4,300	2.3
PGE-07BR	12/7/2016	--	--	7,900	ND (5)	460	ND (5)	12,000 J	580	12	--	4,500	2.1
PGE-08	12/10/2015	--	--	6,700	ND (5)	1,800	44	13,000 J	780	13	--	4,600	2.7
PGE-08	12/7/2016	--	--	6,500	ND (5)	1,900	44	13,000	870	21	--	4,200	3.9
PM-03	12/8/2015	--	--	360	ND (0.5)	64	82	870	84	15	--	150	0.21
PM-03	4/5/2016	--	--	360	ND (0.5)	65	85	910	95	20	--	170	0.33
PM-03	12/9/2016	--	--	370	ND (0.5)	67	84	960	88 J	17 J	--	170	0.17
PM-04	12/8/2015	--	--	570	ND (1)	130	60	1,300	97	18	--	260	0.24
PM-04	4/5/2016	--	--	500	ND (1)	87	54	1,100	97	16	--	260	0.42
PM-04	12/9/2016 FD	--	--	520	ND (0.5)	88	54	1,100	86 J	13 J	--	290	0.19
PM-04	12/9/2016	--	--	540	ND (0.5)	88	54	1,100	89 J	14 J	--	290	0.2
TW-01	12/1/2015	--	--	1,900	ND (2.5)	700	110	4,600	310	20	--	1,400	1.4
TW-02D	12/9/2015 FD	--	--	2,300	ND (2.5)	490	150	4,800	240	31	--	1,700	0.97

Table D-4

Additional Water Quality Characterization, December 2015 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,

PG&E Topock Compressor Station, Needles, California

Location ID	Sample Date		Oxygen-18 (00/00)	Deuterium (00/00)	Chloride (mg/L)	Bromide (mg/L)	Sulfate (mg/L)	Alkalinity (total) (mg/L)	Total Dissolved Solids (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Boron (mg/L)
TW-02D	12/9/2015		--	--	2,400	ND (2.5)	490	150	4,800	220	29	--	1,500	0.93
TW-02D	5/10/2016		--	--	2,100	--	470	170	4,500	220	31	--	1,500	--
TW-02D	7/6/2016		--	--	1,700	--	380	160	3,400	180	31	--	1,300	--
TW-02D	12/13/2016		--	--	1,800	ND (2.5)	440	190	4,000	160 J	34	--	1,100	0.85
TW-02S	12/9/2015		--	--	560	ND (0.5)	160	85	1,300	84	18	--	340	0.4
TW-02S	12/13/2016		--	--	880	ND (0.5)	330	200	2,300	96 J	24	--	530	0.5
TW-03D	12/1/2015		--	--	2,100	--	490	130	4,500	250 J	29	--	1,600	--
TW-03D	12/7/2015		--	--	2,200 J	ND (2.5 J)	490 J	--	4,800 J	--	--	--	--	--
TW-03D	1/6/2016		--	--	2,300	--	500	140	4,600	180	27	--	1,500 J	--
TW-03D	2/2/2016		--	--	2,200	--	500	130	4,700	220	30	--	1,300	--
TW-03D	3/2/2016		--	--	2,300	--	520	130	4,700	240	32	--	1,600	--
TW-03D	4/27/2016		--	--	2,300	--	500	150	4,700	240	30	--	1,500	--
TW-03D	5/10/2016		--	--	2,100	--	480	150	4,400	210	27	--	1,400	--
TW-03D	6/7/2016		--	--	2,100	--	490	160	4,400	200	25	--	1,400	--
TW-03D	7/6/2016		--	--	2,100	--	480	130	4,500	230	27	--	1,500	--
TW-03D	8/3/2016		--	--	2,000	--	470	140	4,500	200	25	--	1,500	--
TW-03D	9/8/2016		--	--	2,100	--	500	140	4,500	180 J	25	--	1,400	--
TW-03D	10/6/2016		--	--	2,300	--	510	150	4,400	--	--	--	--	--
TW-03D	11/2/2016	FD	--	--	2,200	--	520	150	4,600	210	31	--	1,500	--
TW-03D	11/2/2016		--	--	2,200	--	510	150	4,500	210	30	--	1,400	--
TW-03D	12/6/2016		--	--	2,300	--	520	140	4,600	210 J	31	--	1,500	--
TW-04	12/8/2015		--	--	7,500	ND (5)	1,000	51	12,000	--	--	--	--	--
TW-05	12/8/2015		--	--	5,000	ND (5)	590	35	8,600	420	21	--	3,000	1.3

Notes:

--- = data were not collected, were not available, were rejected or there was a field instrument malfunction.

* = Result of second analytical run from primary sample

0/00 = differences from global standards in parts per thousand.

FD = field duplicate sample.

J = concentration or reporting limit estimated by laboratory or data validation.

mg/L = milligrams per liter

ND = not detected at the listed reporting limit.

Alkalinity (total) reported as calcium carbonate.

Table D-5

Additional Results from Trial Wells for June 2014 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

			General Chemistry							Dissolved Metals (µg/L)							Dissolved Metals (mg/L)			
Location ID	**Sample Date**	**Sample Method**	**Total Dissolved Solids**	**Specific Conductance**	**Chloride**	**Sulfate**	**Nitrate/Nitrite as Nitrogen**	**Bromide**	**Alkalinity (total)**	**Hexavalent Chromium**	**Chromium, Total**	**Arsenic**	**Iron**	**Manganese**	**Molybdenum**	**Selenium**	**Boron**	**Calcium**	**Magnesium**	**Sodium**
MW-38D	11/5/2014	3V	12,000	20,000	7,600	690	0.068	ND (2.5)	30	17	15	7.4	22	88	86	ND (12)	2.2	400	6.8	2,400
MW-38D	11/5/2014	LF	13,000	20,000	7,700	690	ND (0.05)	ND (2.5)	31	18	17	7	ND (20)	73	90	ND (2.5)	2.3	440	5.9	2,300
MW-38D	4/30/2015	3V	--	--	--	--	ND (0.066)	--	--	16	14	6.3	--	ND (0.5 J)	90	ND (2.5)	--	--	--	--
MW-38D	4/30/2015	LF	--	--	--	--	ND (0.05)	--	--	20	20	6.8	--	ND (0.5)	90	ND (1)	--	--	--	--
MW-38D	12/1/2015	3V	13,000	22,000	7,200	700	0.054	ND (5)	29	20	23	7.7	ND (100)	59	95	ND (2.5)	2.7	440	8.2	5,100
MW-38D	12/1/2015	LF	12,000	22,000	7,200	690	0.05	ND (5)	29	19	19	7.3	ND (100)	43	92	ND (2.5)	2.7	440	8.1	5,100
MW-38D	5/3/2016	3V	--	--	--	--	ND (0.05)	--	--	18	17	7.6	--	56	86	ND (2.5)	--	--	--	--
MW-38D	5/3/2016	LF	--	--	--	--	ND (0.05)	--	--	19	18	7.9	--	74	84	ND (2.5)	--	--	--	--
MW-38D	9/29/2016	LF	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-38D	12/7/2016	3V	13,000	22,000	7,800	740	0.09	ND (2.5)	29	21	21	8.2	33	48	84	ND (2.5)	2.6	380	6.2	4,800
MW-38D	12/7/2016	LF	14,000	23,000	7,800	740	ND (0.05)	ND (2.5)	29	20	21	8.1	59 J	40	87	ND (2.5)	2.7 J	390	6 J	4,900
MW-38S	9/22/2014	3V	--	--	--	--	ND (0.05)	--	--	ND (0.2)	ND (1)	14	--	220	47	ND (0.5)	--	--	--	--
MW-38S	11/5/2014	3V	950	1,500	280	160	ND (0.05)	0.58	180	ND (0.2)	ND (1)	13	84	210	46	ND (0.5)	0.92	26	4.3	300
MW-38S	11/5/2014	LF	940	1,600	270	170	ND (0.05)	0.58	180	ND (0.2)	ND (1)	16	82	220	49	ND (0.5)	0.99	28	4.6	300
MW-38S	2/9/2015	3V	--	--	--	--	ND (0.05)	--	--	ND (0.2)	ND (1)	14	--	230	43	ND (0.5)	--	--	--	--
MW-38S	2/9/2015	LF	--	--	--	--	ND (0.05)	--	--	0.22	ND (1)	15	--	220	44	ND (0.5)	--	--	--	--
MW-38S	4/30/2015	3V	--	--	--	--	ND (0.05)	--	--	ND (0.2)	ND (1)	13	--	240	38	ND (0.5)	--	--	--	--
MW-38S	4/30/2015	LF	--	--	--	--	ND (0.071)	--	--	ND (0.2)	ND (1)	13	--	240	37	ND (0.5)	--	--	--	--
MW-38S	9/28/2015	3V	--	--	--	--	ND (0.05)	--	--	ND (0.2)	ND (1)	14	--	250	37	ND (0.5)	--	--	--	--
MW-38S	9/28/2015	LF	--	--	--	--	ND (0.05)	--	--	ND (0.2)	ND (1)	14	--	240	37	ND (0.5)	--	--	--	--
MW-38S	12/1/2015	3V	880	1,500	250	160	ND (0.05)	ND (0.5)	170	ND (0.2)	ND (1)	13	91	230	41	ND (0.5)	0.99	27	5.3	300
MW-38S	12/1/2015	LF	880	1,500	260	160	ND (0.05)	ND (0.5)	180	ND (0.2)	ND (1)	14	76	230	40	ND (0.5)	0.97	27	5.3	330
MW-38S	2/24/2016	3V	--	--	--	--	ND (0.05)	--	--	ND (0.2)	ND (1)	14	--	230	43	ND (0.5)	--	--	--	--
MW-38S	2/24/2016	LF	--	--	--	--	ND (0.05)	--	--	ND (0.2)	ND (1)	14	--	220	44	ND (0.5)	--	--	--	--
MW-38S	5/3/2016	3V	--	--	--	--	0.17	--	--	ND (0.2)	ND (1)	11	--	210	41	ND (0.5)	--	--	--	--
MW-38S	5/3/2016	LF	--	--	--	--	0.24	--	--	ND (0.2)	ND (1)	13	--	220	39	ND (0.5)	--	--	--	--
MW-38S	9/29/2016	3V	--	--	--	--	0.78	--	--	0.99	2.3	9.8	--	170	44	ND (0.5)	--	--	--	--
MW-38S	9/29/2016	LF	--	--	--	--	1	--	--	ND (0.2)	1.4	11	--	190	44	ND (0.5)	--	--	--	--
MW-38S	12/7/2016	3V	880	1,500	240	160	1.4	0.6	190	2.7	2.3	9.6	55	130	47	ND (0.5)	0.86	21	4	300
MW-38S	12/7/2016	LF	890	1,600	250	160	1.3	0.64	180	2.2	2.1	9.9	23	130	48	ND (0.5)	0.86	22	4.1	300
MW-38S	12/7/2016 FD	3V	840	1,600	240	160	1.4	0.6	190	2.5	2.5	9.9	23	140	50	ND (0.5)	0.89	21	4.1	310
MW-40D	12/4/2014	H	10,000	13,000	5,500	640	3.1	ND (2.5)	53	73	67	6	ND (20)	7.4	66	ND (2.5)	1.8	410	23	3,300
MW-40D	12/4/2014	LF	10,000	13,000	5,200	690	3.3	ND (2.5)	47	160	140	4.5	ND (20)	ND (0.5)	59	1.7	1.6	400	32	3,100
MW-40D	5/12/2015	H	--	--	--	--	0.88	--	--	ND (1)	ND (1)	17	--	1,500	64	ND (2.5)	--	--	--	--
MW-40D	5/12/2015	LF	--	--	--	--	2.9	--	--	120	110	4.3	--	ND (0.5 J)	53	ND (2.5)	--	--	--	--
MW-40D	12/7/2015	H	8,700	16,000	5,000	670	0.067	ND (5)	61	82	78	4.2	23	54	48	ND (2.5)	2.1	420	40	3,200
MW-40D	12/7/2015	LF	9,000	16,000	4,900	670	0.26	ND (5)	55	98	87	3.9	46	47	49	ND (2.5)	2	420	40	3,300
MW-40D	12/7/2015 FD	H	8,900	16,000	4,800	640	0.23	ND (5)	56	97	88	3.9	ND (20)	47	48	ND (2.5)	2.1	450	39	3,300
MW-40D	5/4/2016	H	--	--	--	--	1.1	--	--	120	110	4.4	--	12	49	1.5	--	--	--	--
MW-40D	5/4/2016	LF	--	--	--	--	2.7	--	--	130	110	4.1	--	1.3	49	ND (2.5)	--	--	--	--
MW-40S	12/4/2014	H	--	2,100	--	--	3.8	--	--	7	6.7	1.2	--	ND (0.5)	7.6	1.7	--	--	--	--
MW-40S	12/4/2014	LF	--	2,100	--	--	3.8	--	--	7.6	7.1	1.2	--	ND (0.5)	8.5	2	--	--	--	--
MW-40S	12/7/2015	H	--	2,500	--	--	4.3	--	--	10	9.1	1.7	--	ND (0.5)	12	2.8	--	--	--	--
MW-40S	12/7/2015	LF	--	2,500	--	--	3.7	--	--	8.1	11	1.3	--	ND (0.5)	9.2	2	--	--	--	--

Notes:

ND =parameter not detected at the listed reporting limit.
--- = data were either not collected, not available or were rejected
3V = three volume.
H = HYDRASleeve™
LF = Low Flow (minimal drawdown)
µg/L = micrograms per liter.
mg/L = miligrams per liter.

General chemistry results in milligrams per liter (mg/L), except Specific conductance which is in µS/cm.

Nitrate and Nitrate/Nitrite reported as Nitrogen.

Alkalinity bicarbonate result equals Alkalinity (total) result. Alkalinity (total) shown on table. Alkanlity carbonate result and hydroxide result are ND at 5 mg/L.

APPENDIX E

Hydraulic Data for Interim Measures Reporting Period

Table E-1

Average Monthly and Quarterly Groundwater Elevations, Fourth Quarter 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

Well ID	Aquifer Zone	November 2016	December 2016	Quarter Average	Days in Quarter Average
I-3	River Station	454.40	453.55	453.97	61
MW-20-070	Shallow Zone	452.91	452.22	452.56	61
MW-20-100	Middle Zone	452.44	451.70	452.06	61
MW-20-130	Deep Zone	451.90	451.13	451.51	61
MW-22	Shallow Zone	454.06	453.61	453.83	61
MW-25	Shallow Zone	454.86	454.36	454.61	61
MW-26	Shallow Zone	INC	INC	INC	INC
MW-27-020	Shallow Zone	453.96	453.16	453.56	61
MW-27-060	Middle Zone	INC	INC	INC	INC
MW-27-085	Deep Zone	453.85	453.12	453.48	61
MW-28-025	Shallow Zone	453.81	453.13	453.46	61
MW-28-090	Deep Zone	453.86	453.10	453.47	61
MW-30-050	Middle Zone	453.44	452.78	453.10	61
MW-31-060	Shallow Zone	INC	INC	INC	INC
MW-31-135	Deep Zone	453.17	452.46	452.81	61
MW-32-035	Shallow Zone	453.73	453.07	453.39	61
MW-33-040	Shallow Zone	454.03	453.35	453.68	61
MW-33-090	Middle Zone	454.22	453.51	453.86	61
MW-33-150	Deep Zone	454.22	453.52	453.86	61
MW-34-055	Middle Zone	453.97	454.01	453.99	61
MW-34-080	Deep Zone	453.94	453.23	453.58	61
MW-34-100	Deep Zone	453.79	453.09	453.43	61
MW-35-060	Shallow Zone	454.38	453.72	454.04	61
MW-35-135	Deep Zone	454.97	454.35	454.65	61
MW-36-020	Shallow Zone	INC	INC	INC	INC
MW-36-040	Shallow Zone	INC	INC	INC	INC
MW-36-050	Middle Zone	453.68	452.94	453.31	61
MW-36-070	Middle Zone	453.63	452.97	453.30	61
MW-36-090	Deep Zone	453.05	452.42	452.73	61
MW-36-100	Deep Zone	453.22	452.61	452.91	61
MW-39-040	Shallow Zone	453.49	452.79	453.14	61
MW-39-050	Middle Zone	453.48	452.75	453.11	61
MW-39-060	Middle Zone	453.30	452.61	452.95	61
MW-39-070	Middle Zone	452.79	452.07	452.42	61
MW-39-080	Deep Zone	INC	INC	INC	INC

Table E-1

Average Monthly and Quarterly Groundwater Elevations, Fourth Quarter 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

Well ID	Aquifer Zone	November 2016	December 2016	Quarter Average	Days in Quarter Average
MW-39-100	Deep Zone	452.85	452.70	452.77	61
MW-42-030	Shallow Zone	INC	INC	INC	INC
MW-42-065	Middle Zone	INC	INC	INC	INC
MW-43-025	Shallow Zone	453.71	452.98	453.34	61
MW-43-090	Deep Zone	453.96	453.19	453.56	61
MW-44-070	Middle Zone	INC	INC	INC	INC
MW-44-115	Deep Zone	453.35	452.66	453.00	61
MW-44-125	Deep Zone	453.92	453.16	453.53	61
MW-45-095a	Deep Zone	452.09	451.93	452.01	61
MW-46-175	Deep Zone	454.02	453.34	453.67	61
MW-47-055	Shallow Zone	454.36	453.72	454.04	61
MW-47-115	Deep Zone	INC	INC	INC	INC
MW-49-135	Deep Zone	454.60	453.78	454.18	61
MW-50-095	Middle Zone	INC	INC	INC	INC
MW-51	Middle Zone	454.34	453.78	454.05	61
MW-54-085	Deep Zone	454.23	453.74	454.03	51
MW-54-140	Deep Zone	INC	INC	INC	INC
MW-54-195	Deep Zone	INC	INC	INC	INC
MW-55-045	Middle Zone	455.60	455.33	455.47	61
MW-55-120	Deep Zone	455.71	455.45	455.58	61
PT2D	Deep Zone	452.57	451.85	452.20	61
PT5D	Deep Zone	453.07	452.43	452.74	61
PT6D	Deep Zone	453.05	452.37	452.71	61
RRB	River Station	INC	INC	INC	INC

Notes:

Average reported in ft amsl (feet above mean sea level).
Quarter Average = average of daily averages over reporting period.
INC = Data incomplete, less than 75% of data available over reporting period due to rejection or field equipment malfunction.

Table E-2

Average, Minimum and Maximum Groundwater Elevations, January 2016 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

Well ID	Aquifer Zone	Minimumm (ft amsl)	Maximum (ft amsl)	Average (ft amsl)	Number of Days Reporting Data
I-3	River Station	453.55	457.17	455.19	366
MW-20-070	Shallow Zone	452.22	454.95	454.04	366
MW-20-100	Middle Zone	451.70	454.58	453.44	366
MW-20-130	Deep Zone	451.13	454.28	453.18	366
MW-22	Shallow Zone	453.61	455.68	454.97	366
MW-25	Shallow Zone	454.36	456.07	455.41	339
MW-26	Shallow Zone	454.07	455.79	455.17	195
MW-27-020	Shallow Zone	453.16	456.70	455.16	366
MW-27-060	Middle Zone	453.75	456.72	455.15	305
MW-27-085	Deep Zone	453.12	456.59	455.12	366
MW-28-025	Shallow Zone	453.13	456.60	455.10	366
MW-28-090	Deep Zone	453.10	456.55	455.20	366
MW-30-050	Middle Zone	452.78	455.54	454.83	167
MW-31-060	Shallow Zone	453.57	455.87	454.89	213
MW-31-135	Deep Zone	452.46	455.13	454.24	366
MW-32-035	Shallow Zone	453.07	456.27	454.96	366
MW-33-040	Shallow Zone	453.35	456.06	455.08	366
MW-33-090	Middle Zone	453.51	456.32	455.42	366
MW-33-150	Deep Zone	453.52	456.09	455.26	366
MW-34-055	Middle Zone	453.56	456.72	455.10	366
MW-34-080	Deep Zone	453.23	456.92	455.20	366
MW-34-100	Deep Zone	453.09	456.75	454.91	366
MW-35-060	Shallow Zone	453.72	456.91	455.60	366
MW-35-135	Deep Zone	454.35	456.91	455.90	308
MW-36-020	Shallow Zone	453.57	456.22	454.95	305
MW-36-040	Shallow Zone	453.41	456.31	454.91	278
MW-36-050	Middle Zone	452.94	456.42	454.86	344
MW-36-070	Middle Zone	452.97	456.36	454.87	366
MW-36-090	Deep Zone	452.42	455.85	454.01	366
MW-36-100	Deep Zone	452.61	456.02	454.25	366
MW-39-040	Shallow Zone	452.79	453.99	454.74	138
MW-39-050	Middle Zone	452.75	455.96	454.60	366
MW-39-060	Middle Zone	452.61	455.79	454.42	366
MW-39-070	Middle Zone	452.07	455.27	453.96	366

Table E-2

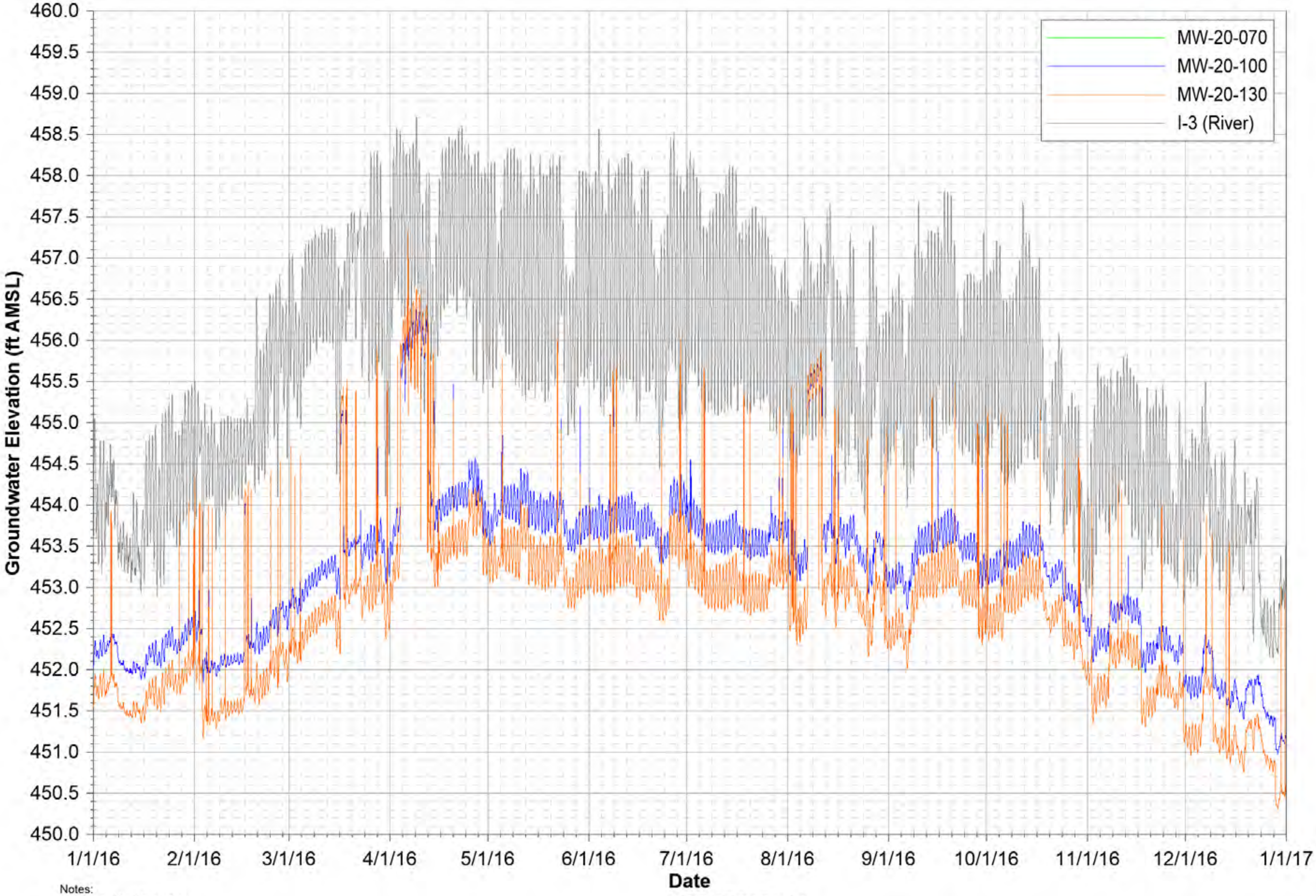
Average, Minimum and Maximum Groundwater Elevations, January 2016 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

Well ID	Aquifer Zone	Minimumm (ft amsl)	Maximum (ft amsl)	Average (ft amsl)	Number of Days Reporting Data
MW-39-080	Deep Zone	452.66	455.17	454.12	220
MW-39-100	Deep Zone	452.70	455.86	454.58	366
MW-42-030	Shallow Zone	453.31	456.18	454.71	188
MW-42-065	Middle Zone	453.38	456.24	454.80	160
MW-43-025	Shallow Zone	452.98	454.56	455.18	137
MW-43-090	Deep Zone	453.19	456.84	455.51	366
MW-44-070	Middle Zone	453.48	456.45	455.01	278
MW-44-115	Deep Zone	452.66	455.91	454.59	366
MW-44-125	Deep Zone	453.16	456.49	455.05	366
MW-45-095a	Deep Zone	451.46	455.87	453.89	366
MW-46-175	Deep Zone	453.34	456.32	455.12	366
MW-47-055	Shallow Zone	453.72	454.77	455.50	118
MW-47-115	Deep Zone	454.22	456.54	455.50	189
MW-49-135	Deep Zone	453.78	456.65	455.61	366
MW-50-095	Middle Zone	453.88	456.00	455.11	273
MW-51	Middle Zone	453.78	456.84	417.19	366
MW-54-085	Deep Zone	453.74	456.92	455.59	356
MW-54-140	Deep Zone	454.33	454.95	455.85	63
MW-54-195	Deep Zone	455.80	457.01	455.98	221
MW-55-045	Middle Zone	454.37	457.19	456.25	339
MW-55-120	Deep Zone	455.45	457.21	456.08	366
PT2D	Deep Zone	451.85	455.13	454.05	366
PT5D	Deep Zone	452.43	455.72	454.41	366
PT6D	Deep Zone	452.37	455.60	454.34	366
RRB	River Station	454.90	456.90	455.54	247

Notes:

Averages reported in ft amsl (feet above mean sea level).
Averages = average of daily averages over reporting period.



Notes:
1. Data subject to review.
2. ft amsl = feet above mean sea level.
3. MW-20-070 data unavailable from January 1, 2016 through December 31, 2016 due to transducer malfunction.

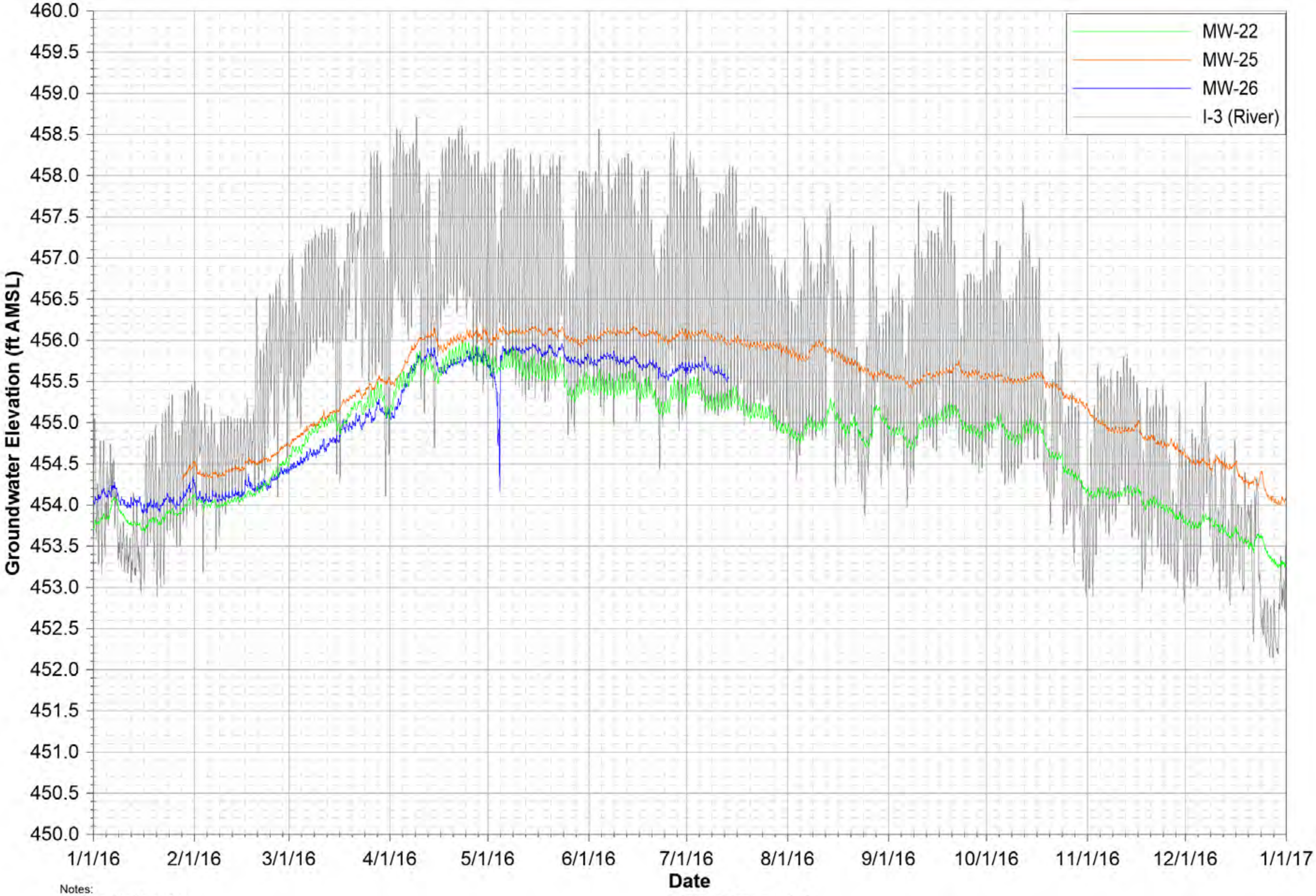
FIGURE E-1A

MW-20 CLUSTER HYDROGRAPHS

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS

\\arcadis-us.com\officedata\Denver-CO-Technical\Aproject\PG&E - Groundwater Monitoring\Reporting\00_Arcadis_rpts\02_GMP_rpts\05_Q416



Notes:
1. Data subject to review.
2. ft amsl = feet above mean sea level.
3. MW-26 data unavailable from July 13, 2016 through December 31, 2016 due to transducer malfunction.

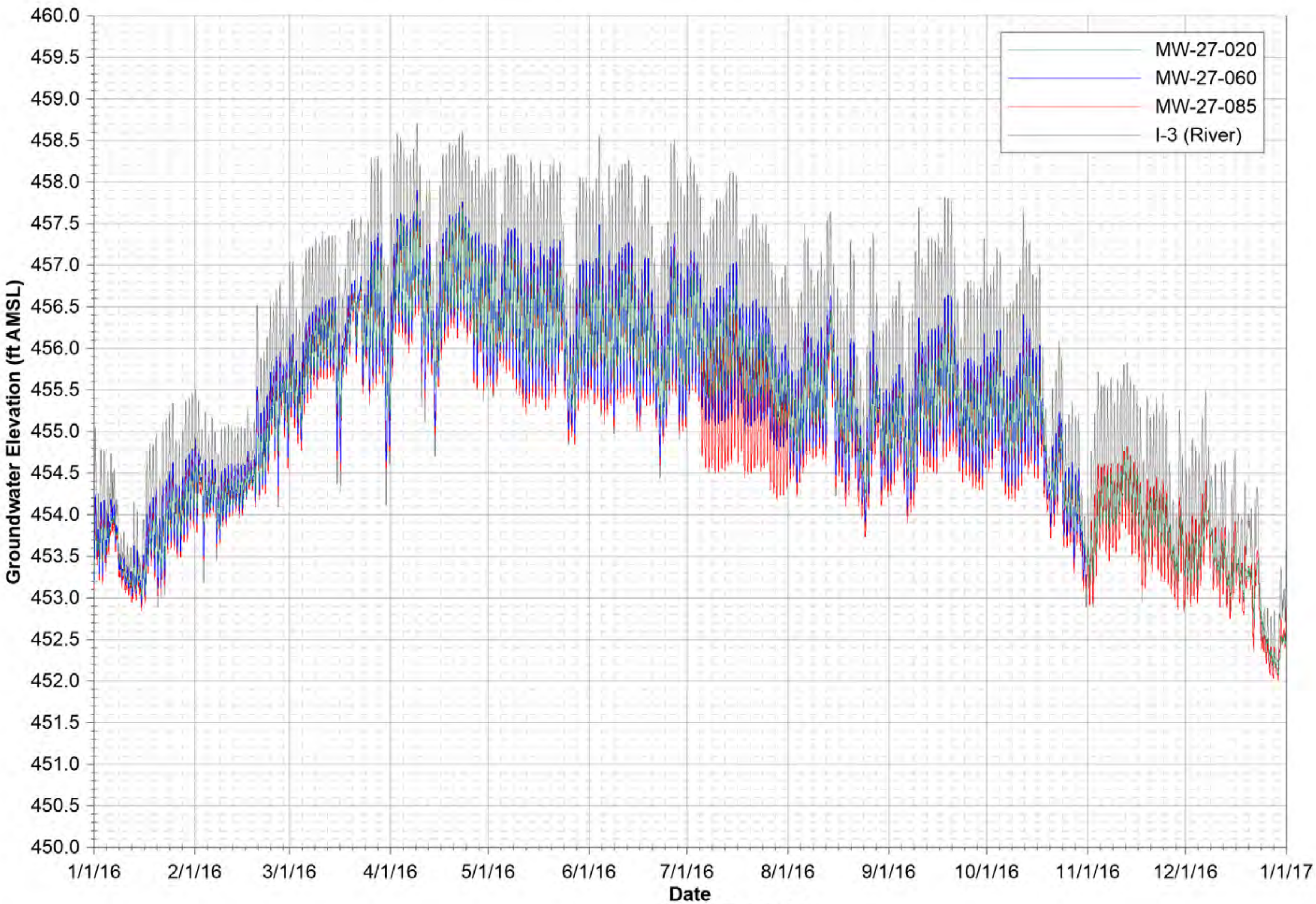
FIGURE E-1B

MW-22, MW-25, AND MW-26 HYDROGRAPHS

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS

\\arcadis-us.com\officedata\Denver-CO-Technical\Aproject\PG&E - Groundwater Monitoring\Reporting\00_Arcadis_rpts\02_GMP_rpts\05_Q416



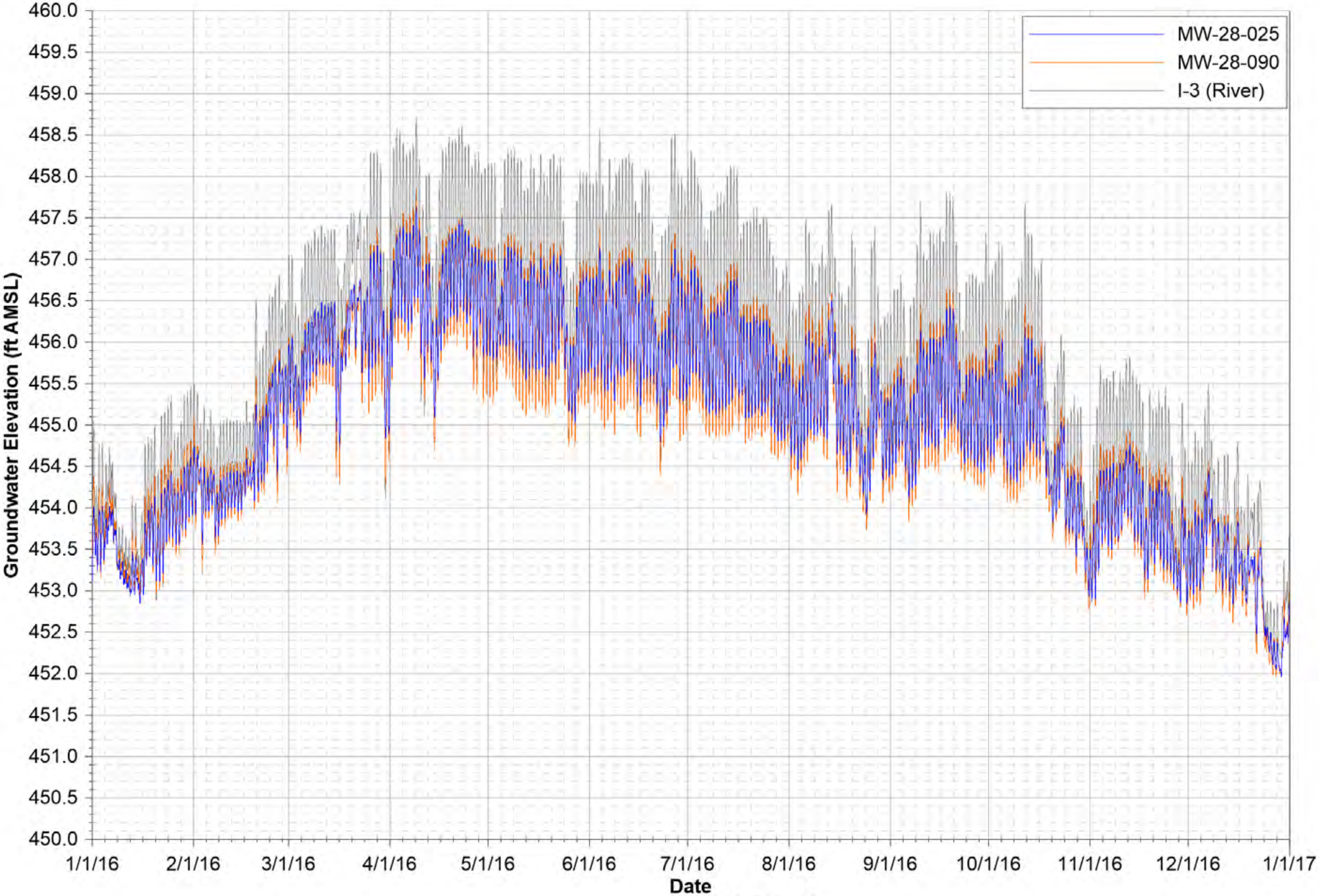
Notes:
1. Data subject to review.
2. ft amsl = feet above mean sea level.
3. MW-27-060 data unavailable from November 1, 2016 through December 31, 2016 due to transducer malfunction.

FIGURE E-1C

MW-27 CLUSTER HYDROGRAPHS

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS



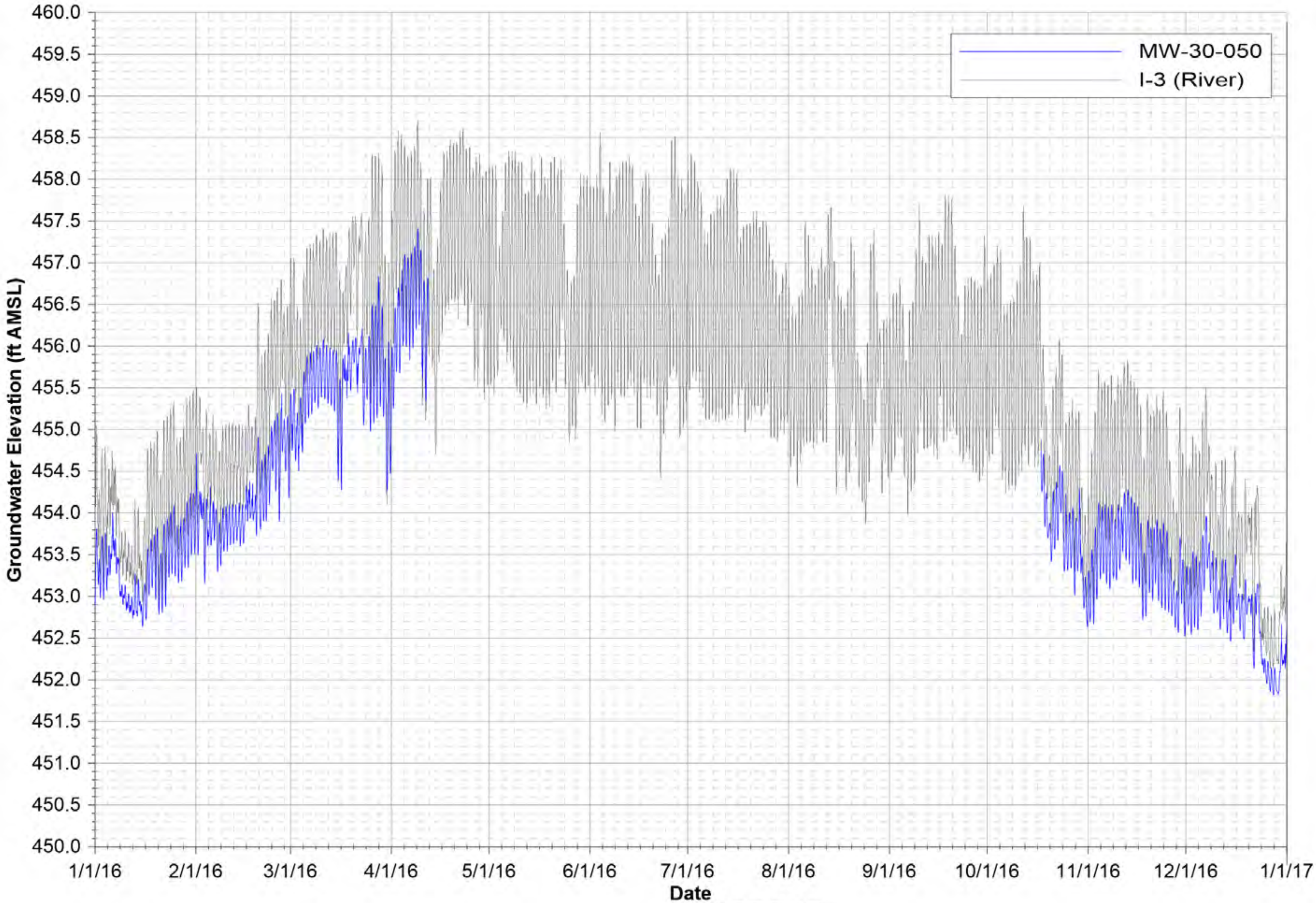
Notes:
1. Data subject to review.
2. ft amsl = feet above mean sea level.

FIGURE E-1D
MW-28 CLUSTER HYDROGRAPHS

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS

\\arcadis-us.com\officedata\Denver-CO-Technical\Aproject\PG&E - Groundwater Monitoring\Reporting\00_Arcadis_rpts\02_GMP_rpts\05_Q416



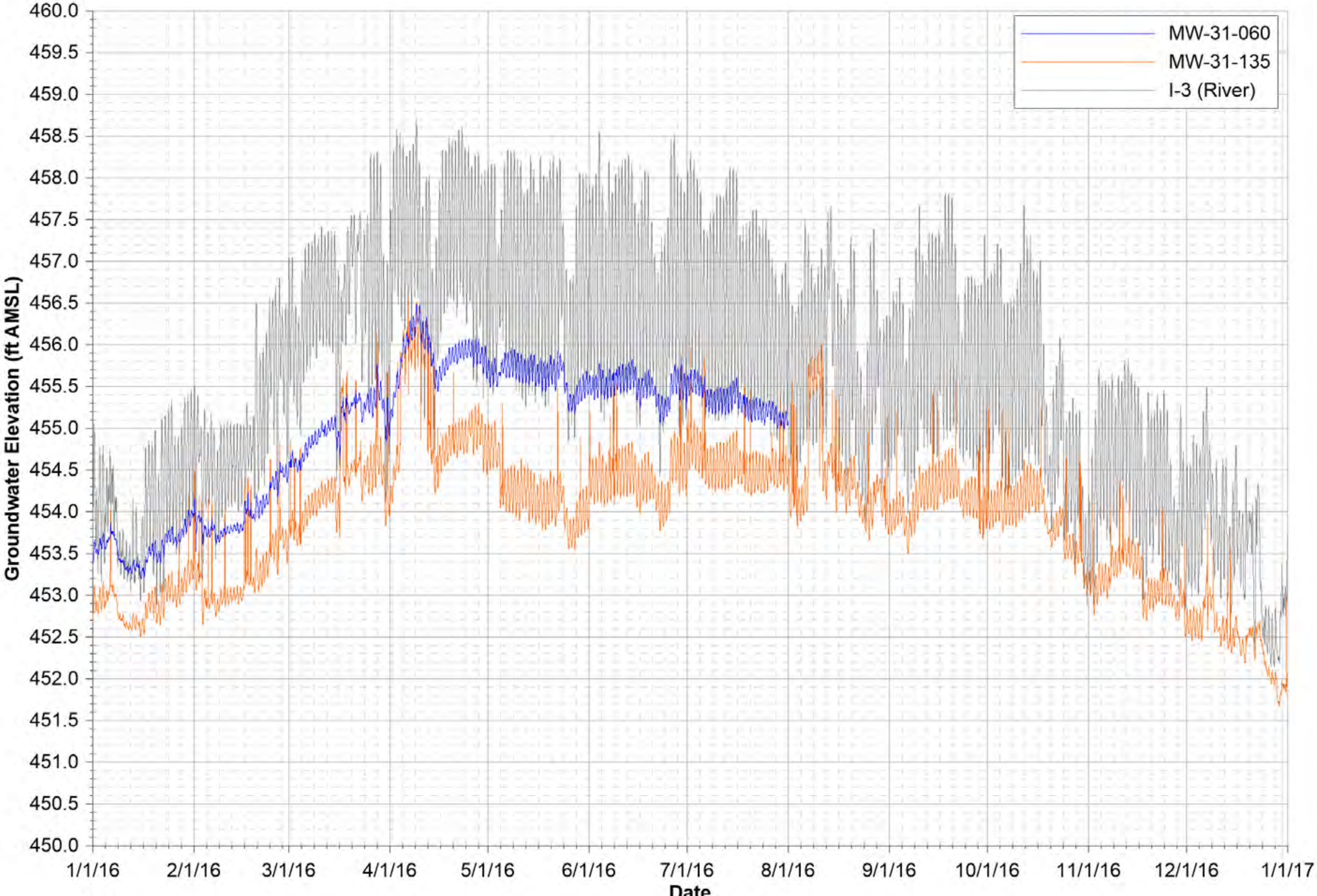
Notes:
1. Data subject to review.
2. ft amsl = feet above mean sea level.
3. MW-30-050 data unavailable from April 13, 2016 through October 17, 2016 due to transducer malfunction.

FIGURE E-1E

MW-30-050 HYDROGRAPH

FOURTH QUARTER 2016 AND ANNUAL INTERIMMEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS



Notes:
1. Data subject to review.
2. ft amsl = feet above mean sea level.
3. MW-31-060 data unavailable from August 1, 2016 through December 31, 2016 due to transducer malfunction.

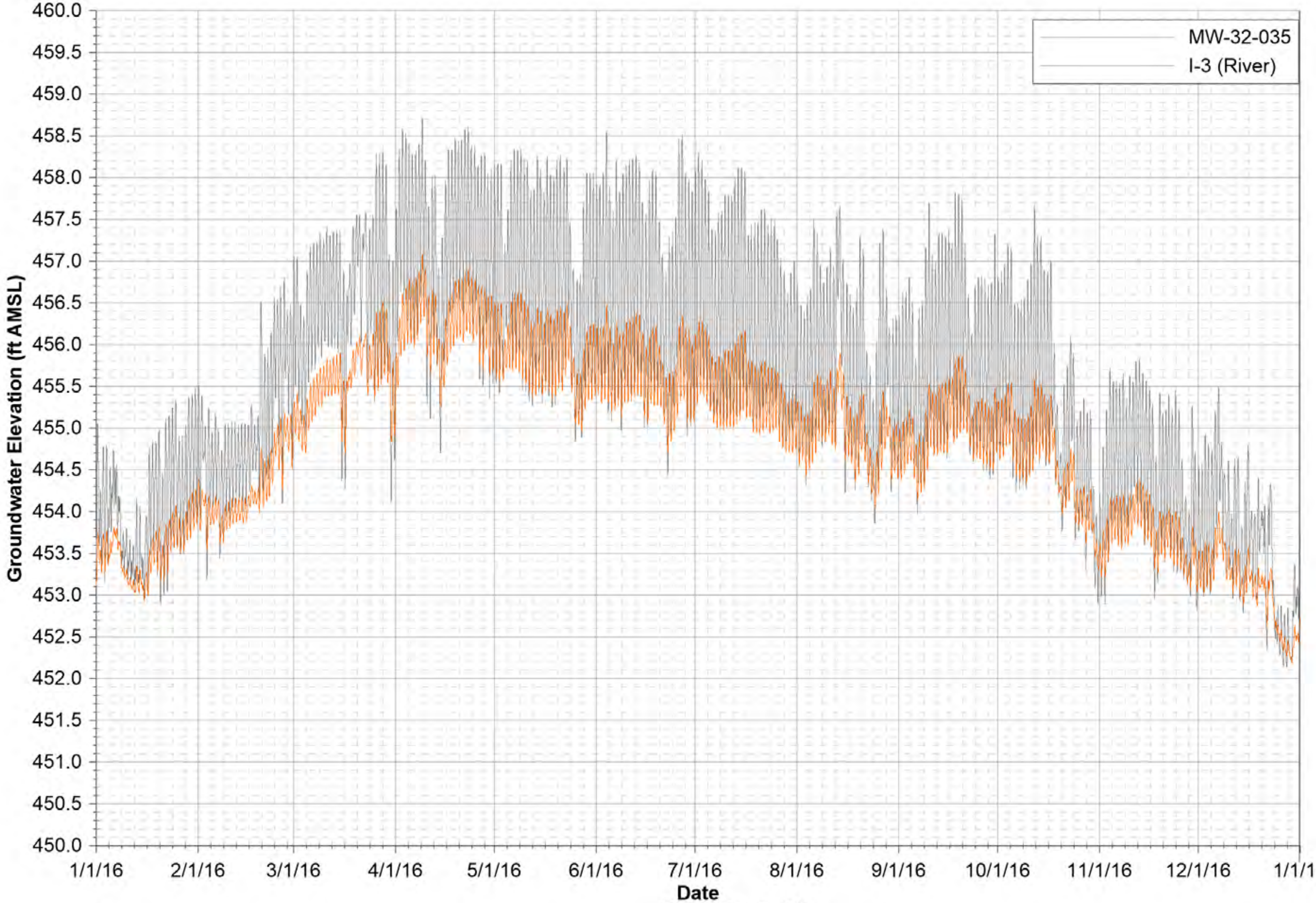
FIGURE E-1F

MW-31 CLUSTER HYDROGRAPHS

FOURTH QUARTER 2016 AND ANNUAL INTERIMMEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS

\\arcadis-us.com\officedata\Denver-CO-Technical\Aproject\PG&E - Groundwater Monitoring\Reporting\00_Arcadis_rpts\02_GMP_rpts\05_Q416



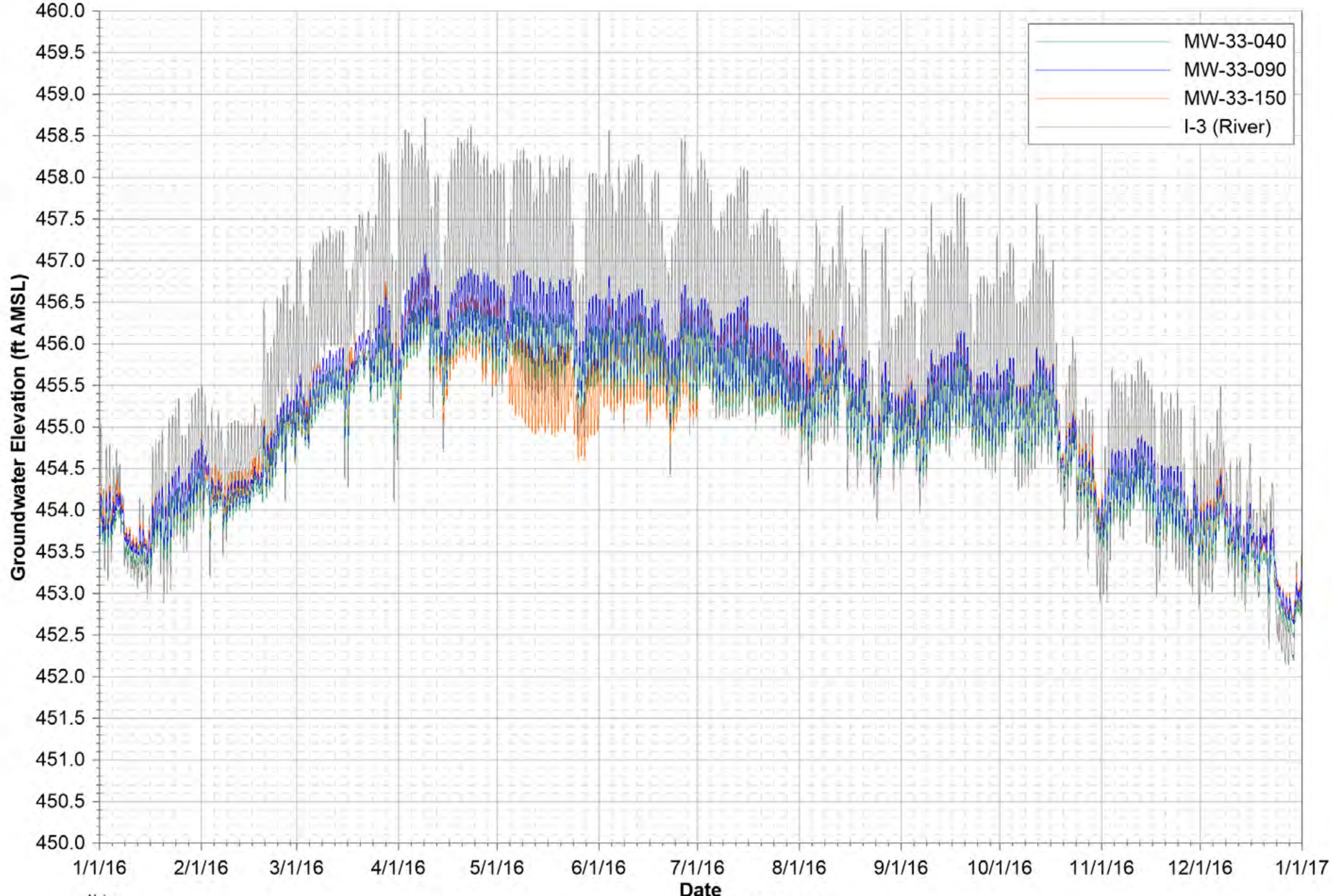
Notes:
1. Data subject to review.
2. ft amsl = feet above mean sea level.

FIGURE E-1G

MW-32-050 HYDROGRAPH

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS



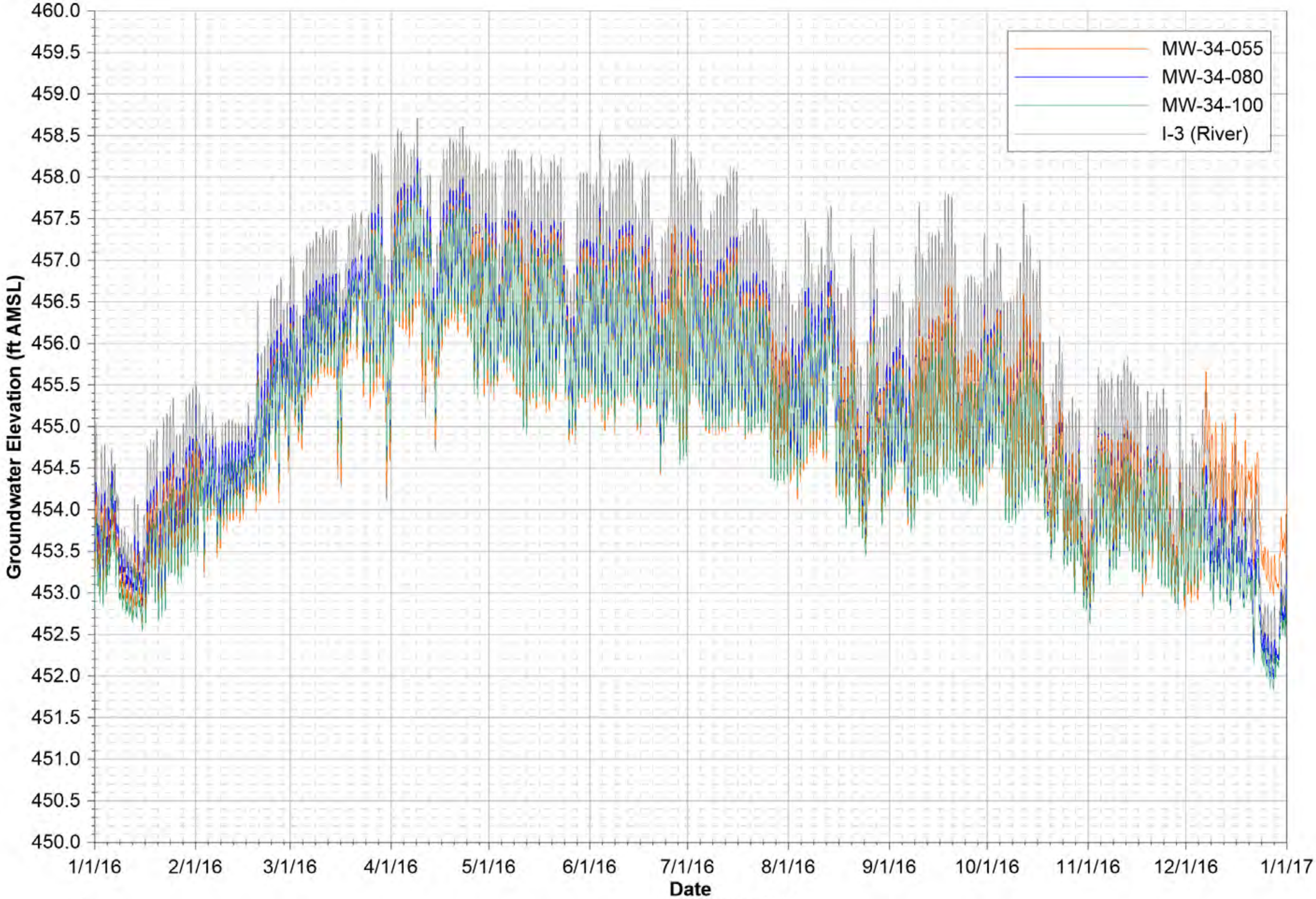
Notes:
1. Data subject to review.
2. ft amsl = feet above mean sea level.

FIGURE E-1H

MW-33 CLUSTER HYDROGRAPHS

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS



Notes:
1. Data subject to review.
2. ft amsl = feet above mean sea level.

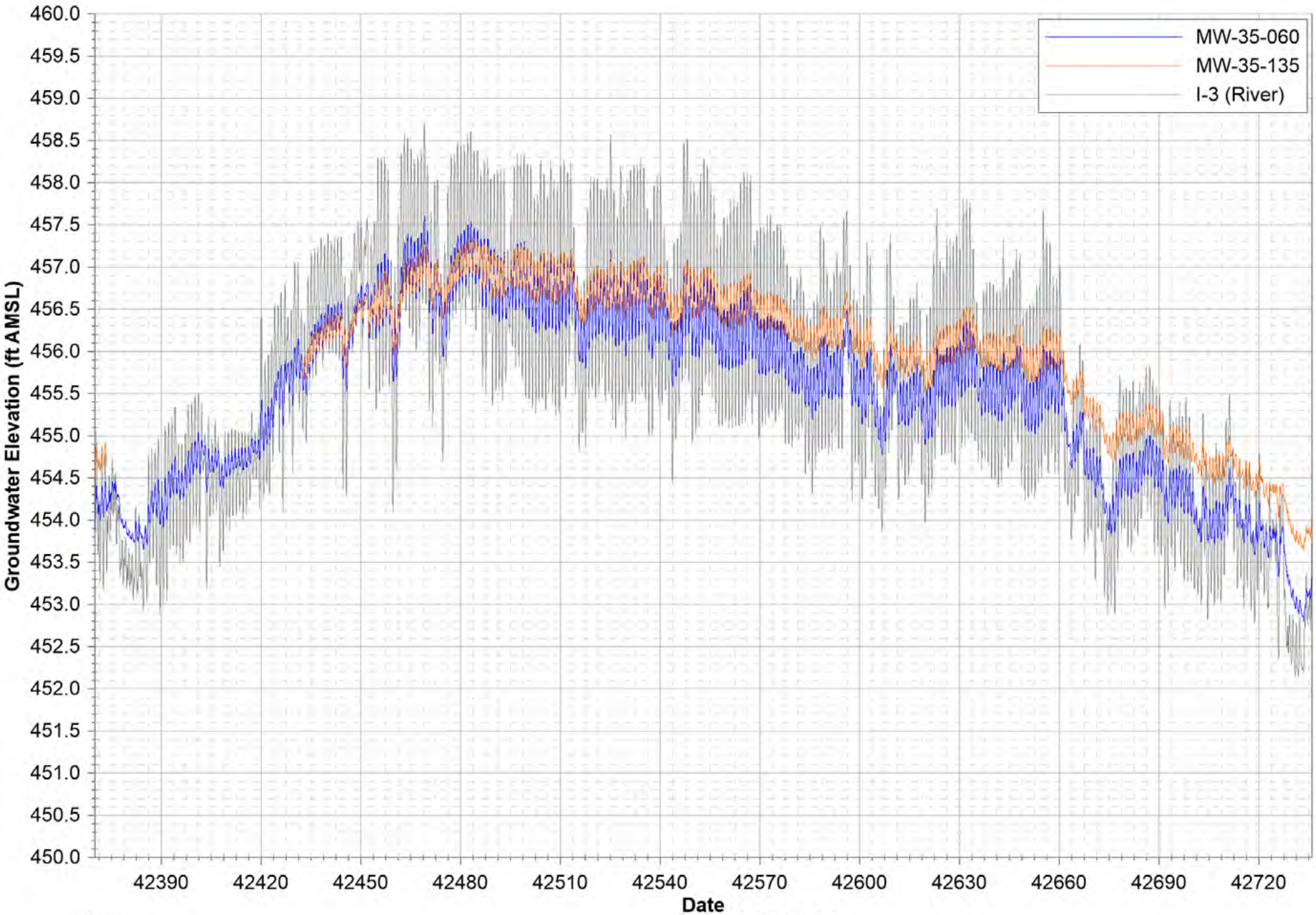
FIGURE E-1I

MW-34 CLUSTER HYDROGRAPHS

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS

\\arcadis-us.com\officedata\Denver-CO-Technical\Aproject\PG&E - Groundwater Monitoring\Reporting\00_Arcadis_rpts\02_GMP_rpts\05_Q416

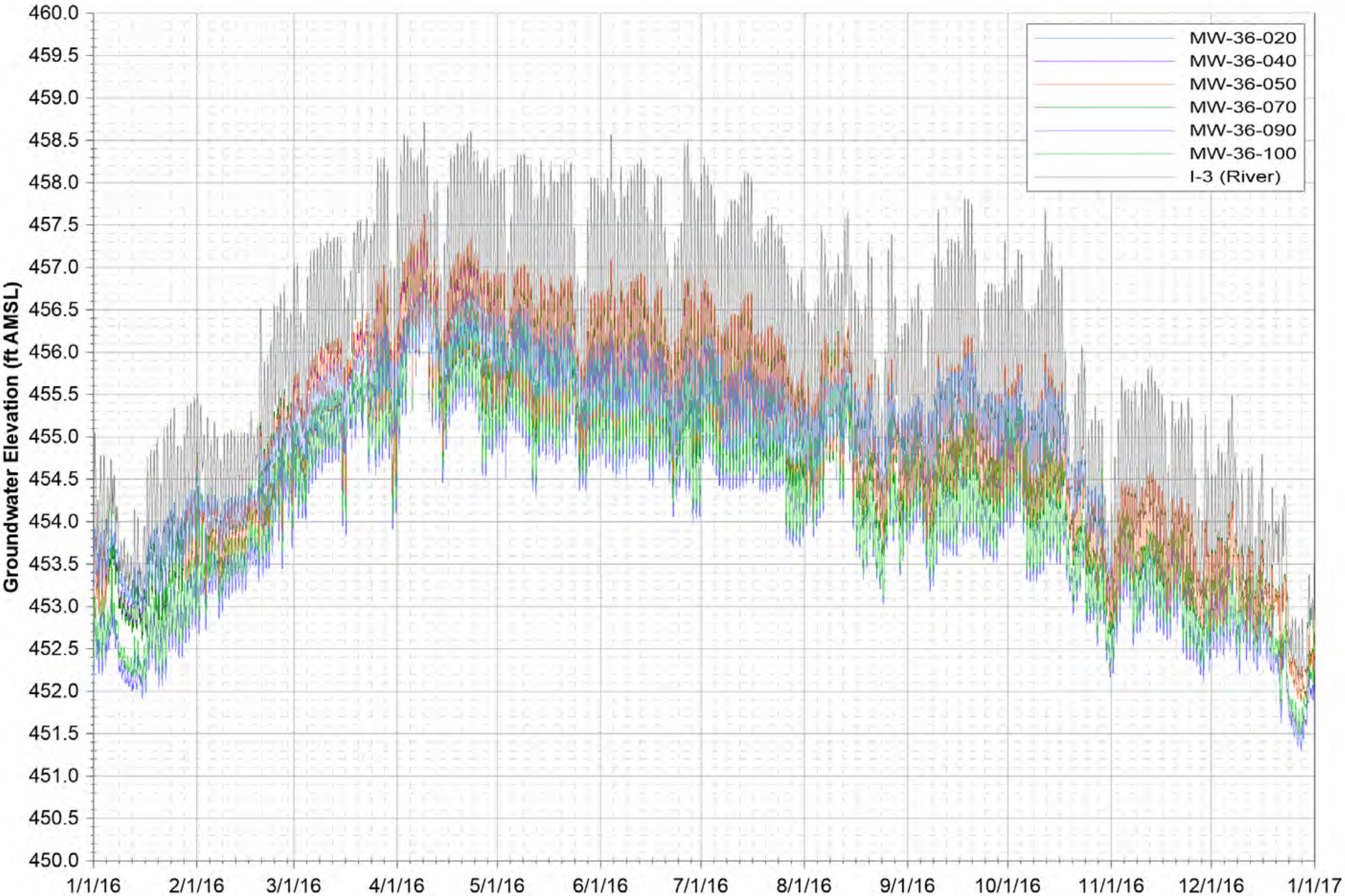


Notes:
1. Data subject to review.
2. ft amsl = feet above mean sea level.
3. MW-35-135 data unavailable from January 5, 2016 through March 3, 2016 due to transducer malfunction.

FIGURE E-1J
MW-35 CLUSTER HYDROGRAPHS

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS



Notes:
1. Data subject to review.
2. ft amsl = feet above mean sea level.
3. MW-36-020 data unavailable from November 1, 2016 through December 31, 2016 due to transducer malfunction.
4. MW-36-040 data unavailable from October 4, 2016 through December 31, 2016 due to transducer malfunction.
5. MW-36-050 data unavailable from January 5, 2016 through January 28, 2016 due to transducer malfunction.

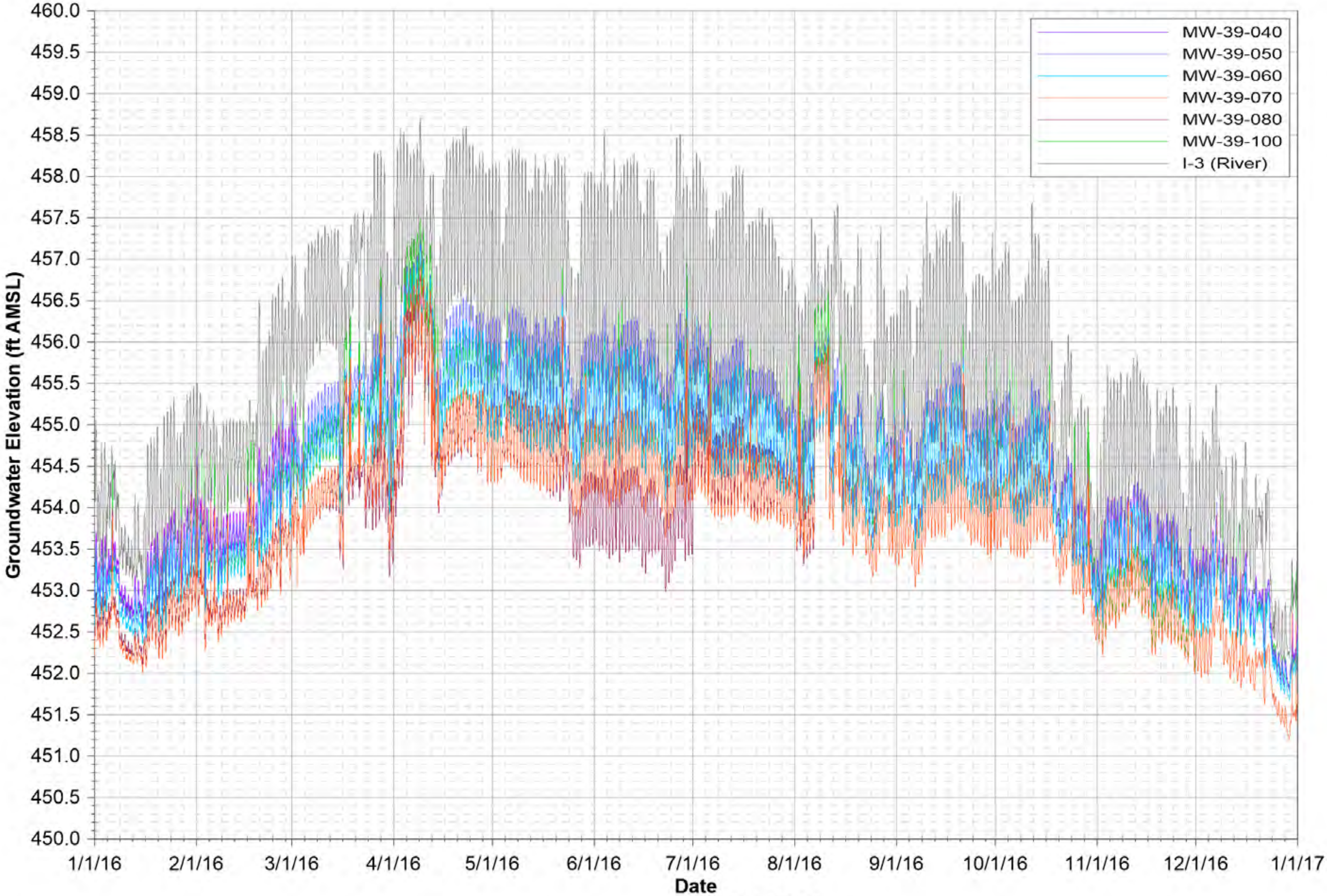
FIGURE E-1K

MW-36 CLUSTER HYDROGRAPHS

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS

\\arcadis-us.com\officedata\Denver-CO-Technical\Aproject\PG&E - Groundwater Monitoring\Reporting\00_Arcadis_rpts\02_GMP_rpts\05_Q416



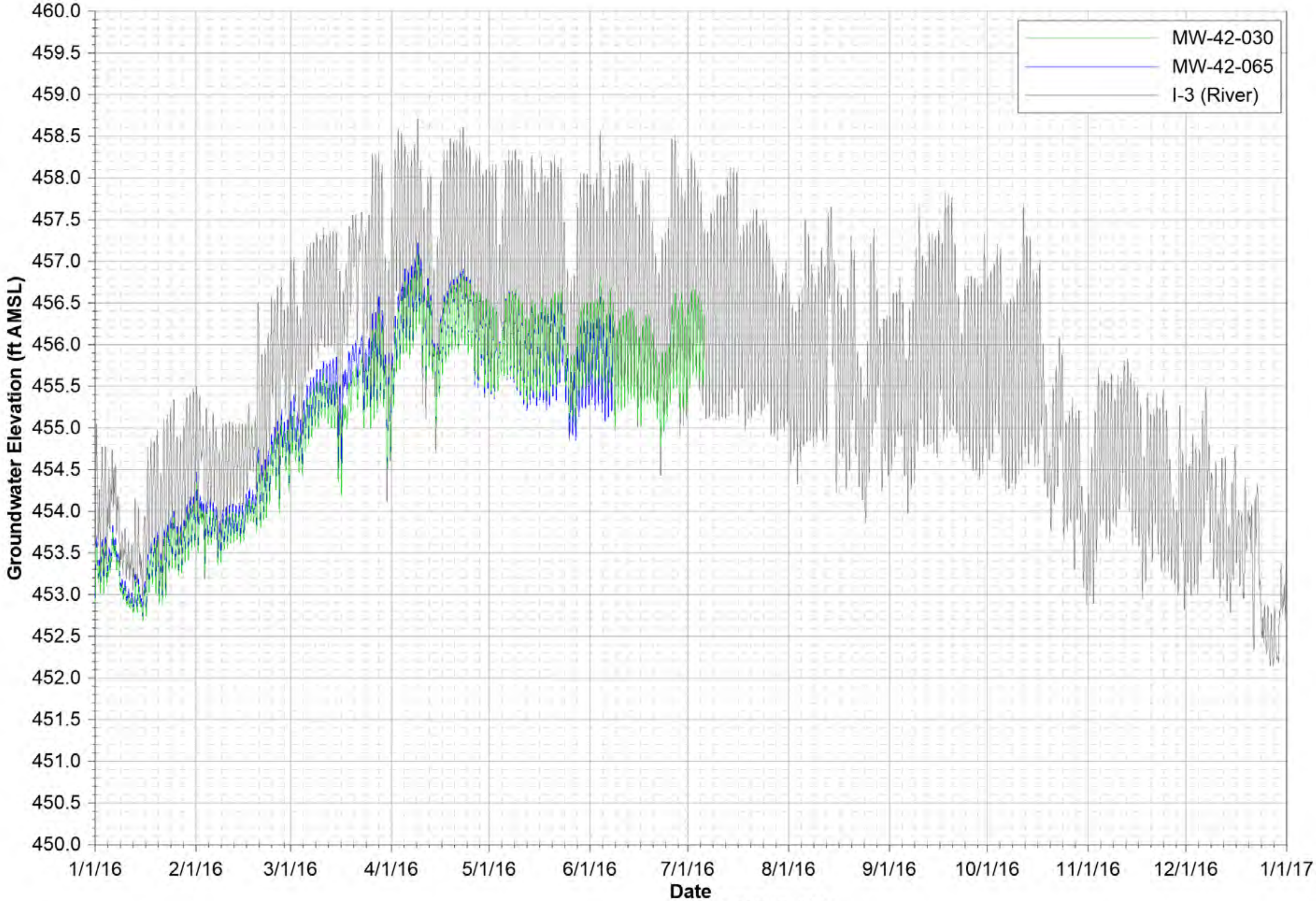
Notes:
1. Data subject to review.
2. ft amsl = feet above mean sea level.
3. MW-39-040 data unavailable from March 2, 2016 through October 17, 2016 due to transducer malfunction.
4. MW-39-080 data unavailable from August 7, 2016 through December 31, 2016 due to transducer malfunction.

FIGURE E-1L

MW-39 CLUSTER HYDROGRAPHS

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS

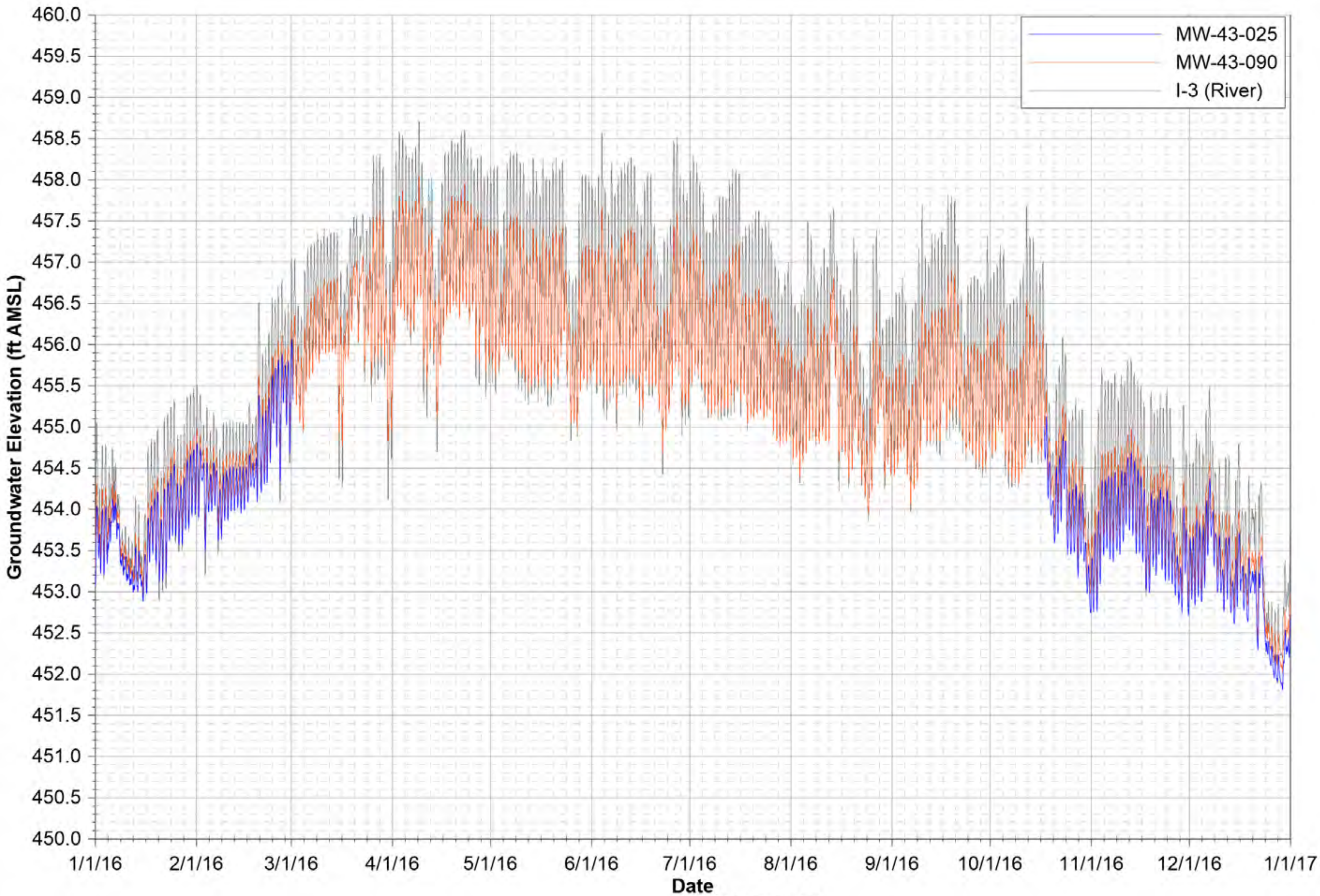


Notes:
1. Data subject to review.
2. ft amsl = feet above mean sea level.
3. MW-42-030 data unavailable from July 6, 2016 through December 31, 2016 due to transducer malfunction.
4. MW-42-065 data unavailable from June 8, 2016 through December 31, 2016 due to transducer malfunction.

FIGURE E-1M
MW-42 CLUSTER HYDROGRAPHS

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS



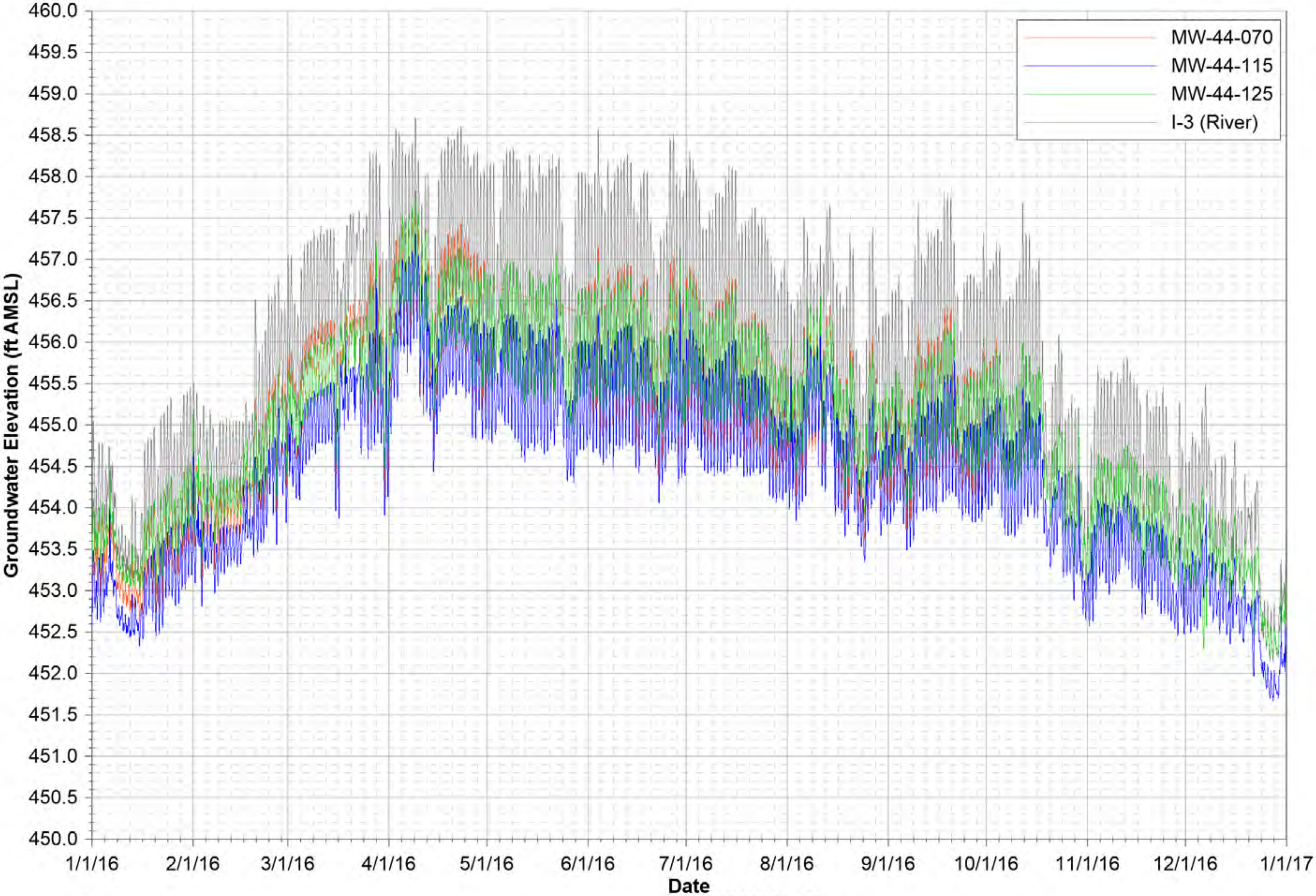
Notes:
1. Data subject to review.
2. ft amsl = feet above mean sea level.
3. MW-43-025 data unavailable from March 1, 2016 through October 17, 2016 due to transducer malfunction.

FIGURE E-1N

MW-43 CLUSTER HYDROGRAPHS

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS



Notes:
1. Data subject to review.
2. ft amsl = feet above mean sea level.
3. MW-44-070 data unavailable from October 4, 2016 through December 31, 2016 due to transducer malfunction.

FIGURE E-1O

MW-44 CLUSTER HYDROGRAPHS

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS

\\arcadis-us.com\officedata\Denver-CO-Technical\Aproject\PG&E - Groundwater Monitoring\Reporting\00_Arcadis_rpts\02_GMP_rpts\05_Q416

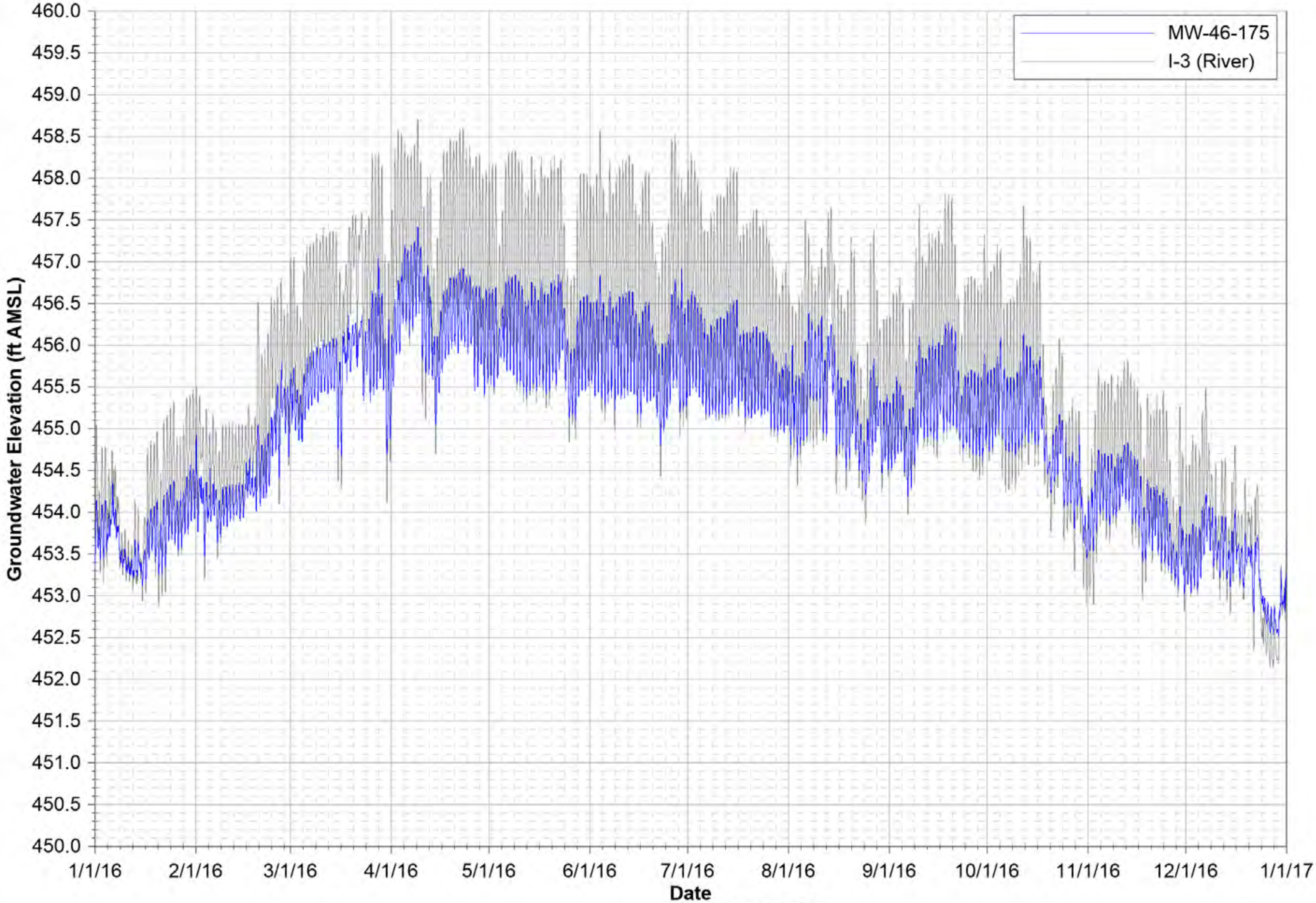
Notes:
1. Data subject to review.
2. ft amsl = feet above mean sea level.

FIGURE E-1P
MW-45-095a HYDROGRAPH

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS

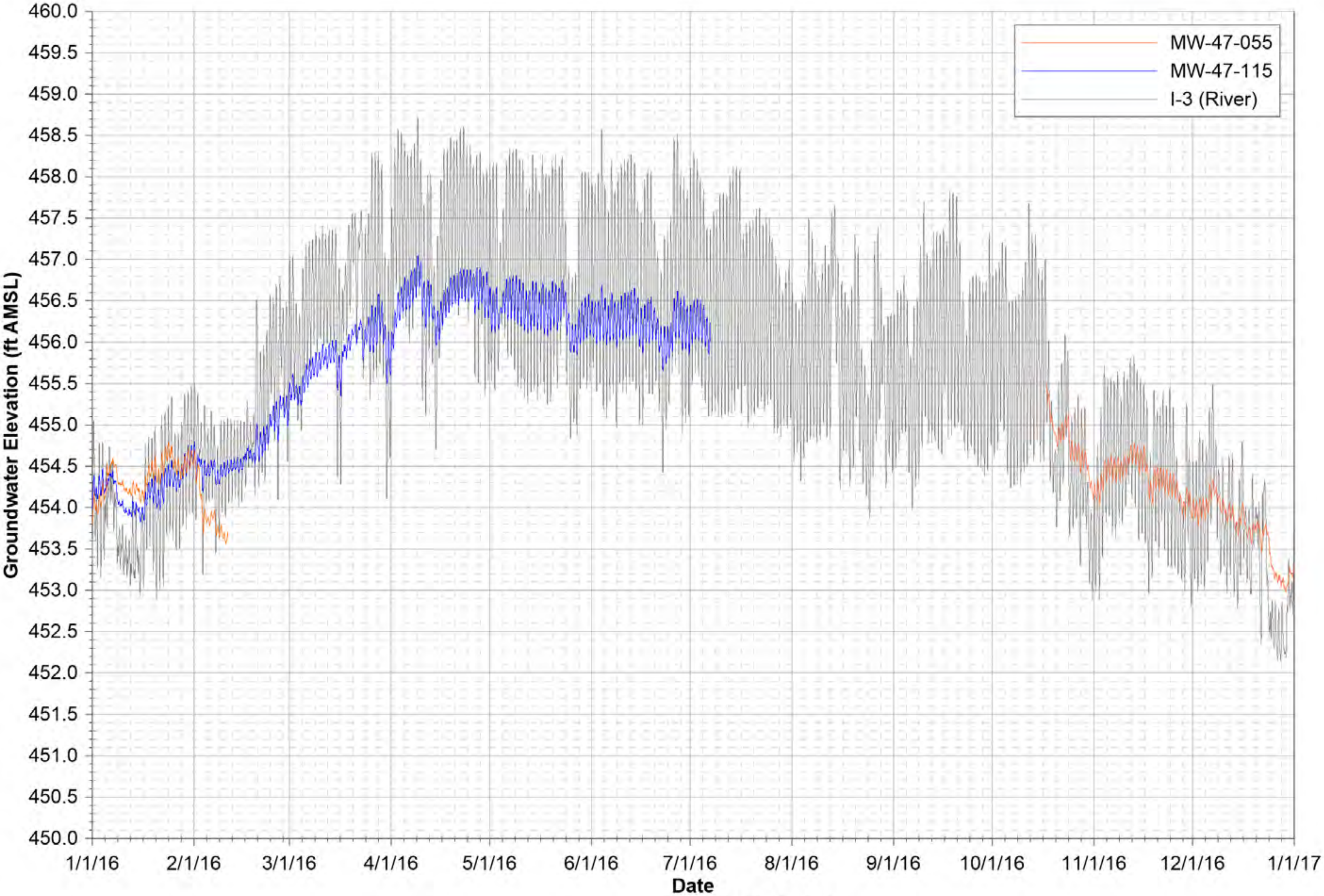
\\arcadis-us.com\officedata\Denver-CO-Technical\Aproject\PG&E - Groundwater Monitoring\Reporting\00_Arcadis_rpts\02_GMP_rpts\05_Q416



Notes:
1. Data subject to review.
2. ft amsl = feet above mean sea level.

FIGURE E-1Q
MW-46-175 HYDROGRAPH
FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS

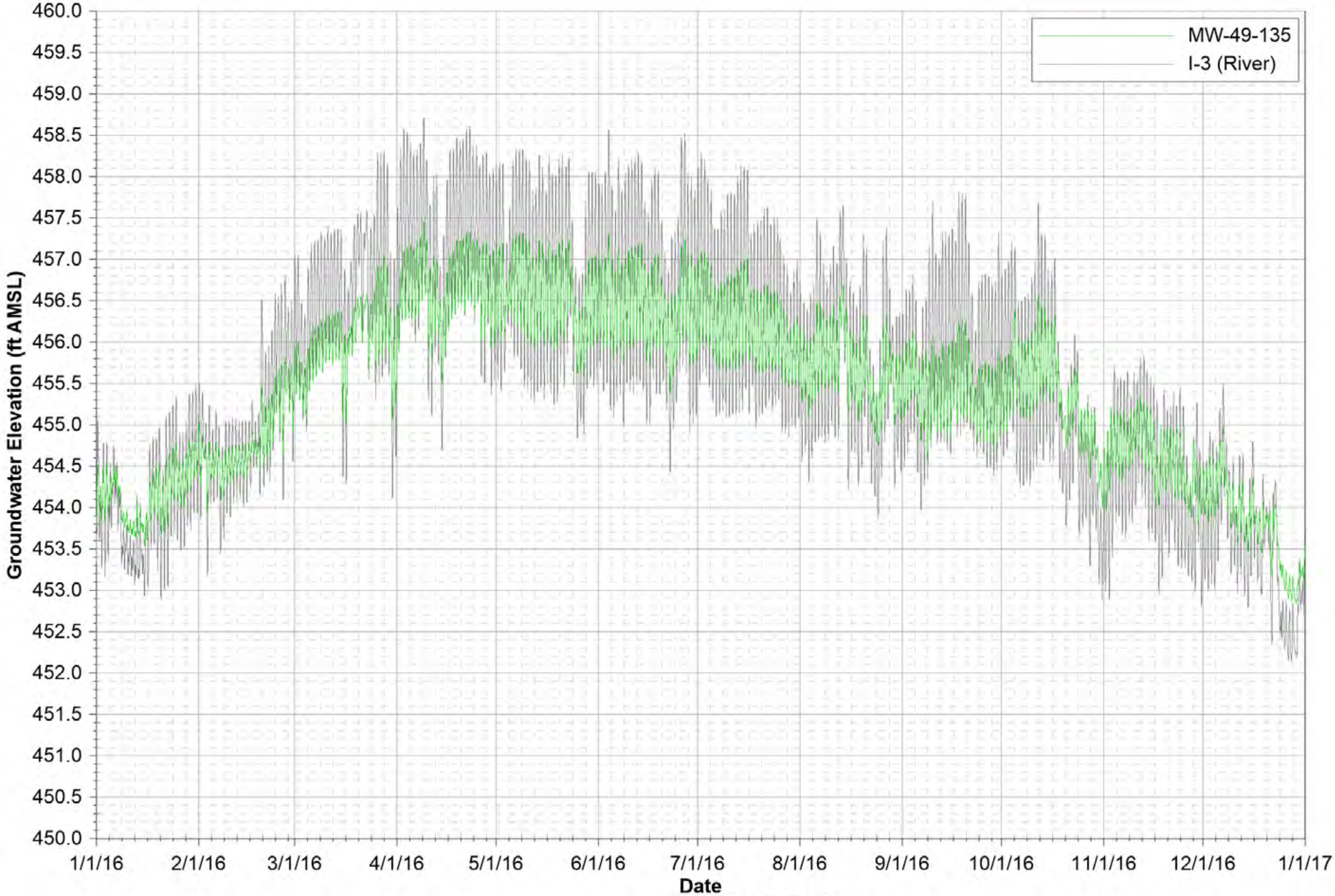


Notes:
1. Data subject to review.
2. ft amsl = feet above mean sea level.
3. MW-47-055 data unavailable from February 11, 2016 through October 17, 2016 due to transducer malfunction.
4. MW-47-115 data unavailable from July 7, 2016 through December 31, 2016 due to transducer malfunction.

FIGURE E-1R
MW-47 CLUSTER HYDROGRAPHS

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

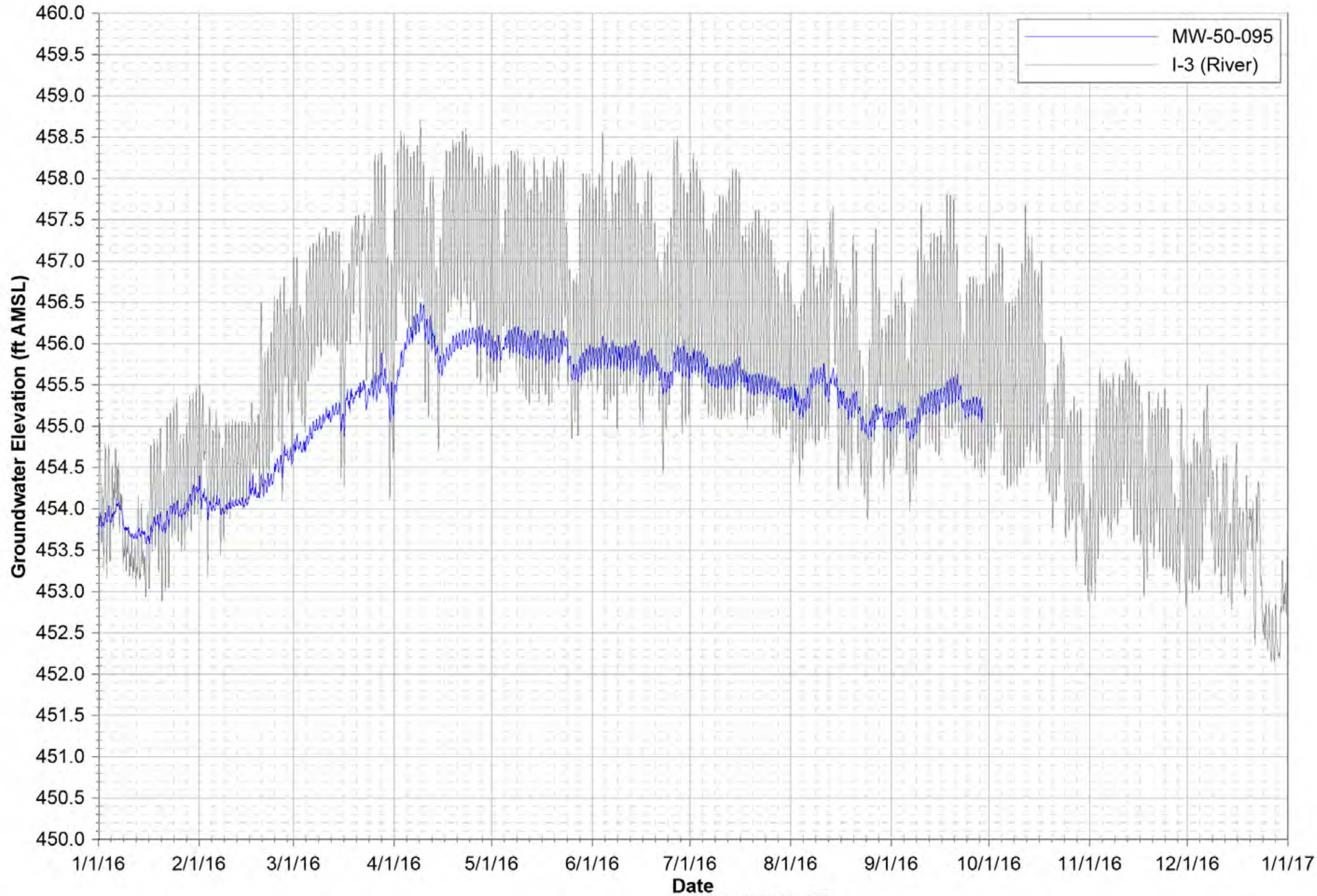
ARCADIS



Notes:
1. Data subject to review.
2. ft amsl = feet above mean sea level.

FIGURE E-1S
MW-49-135 HYDROGRAPH
FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS



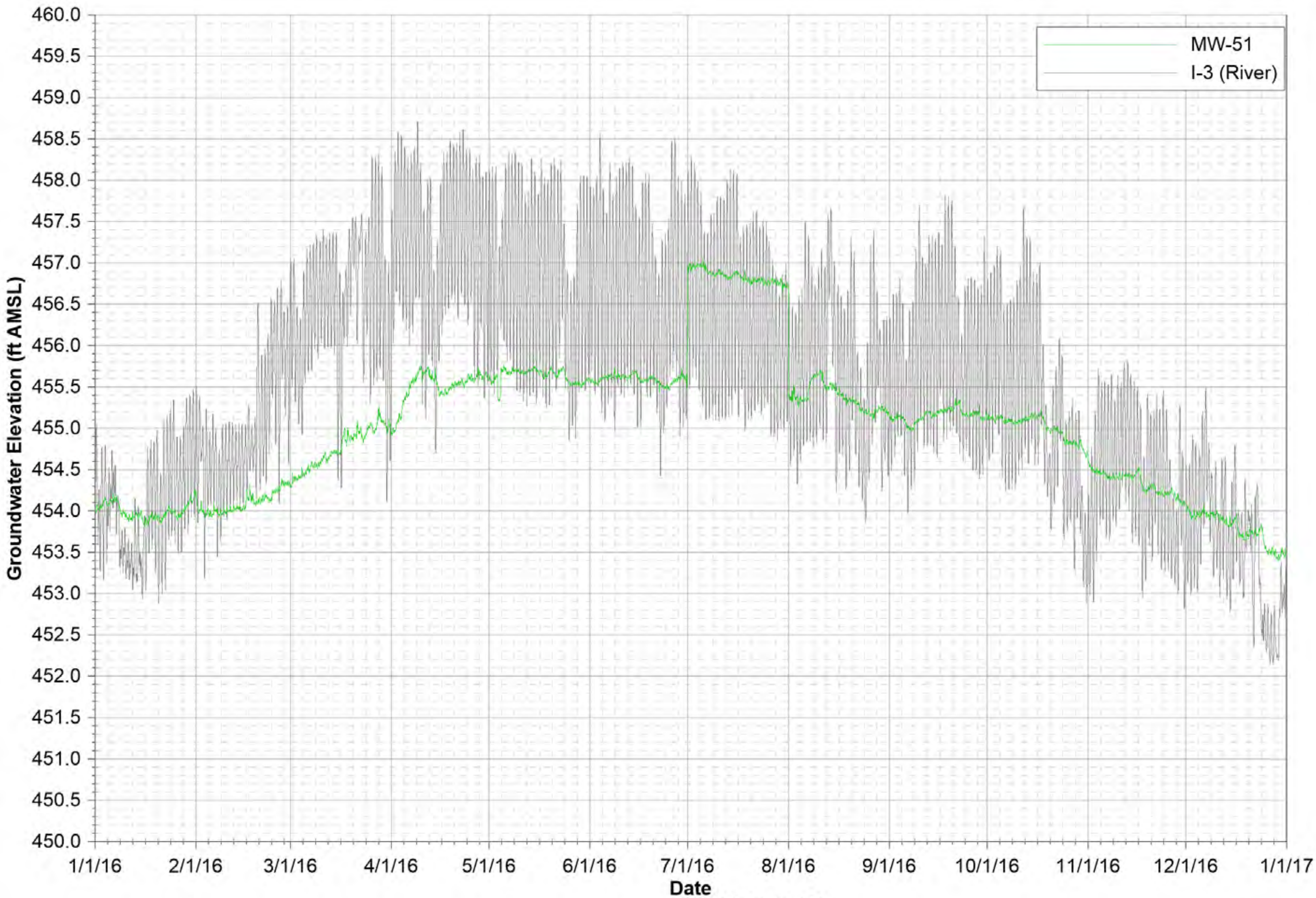
Notes:
1. Data subject to review.
2. ft amsl = feet above mean sea level.
3. MW-50-095 data unavailable from September 29, 2016 through December 31, 2016 due to transducer malfunction.

FIGURE E-1T

MW-50-095 HYDROGRAPH

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS



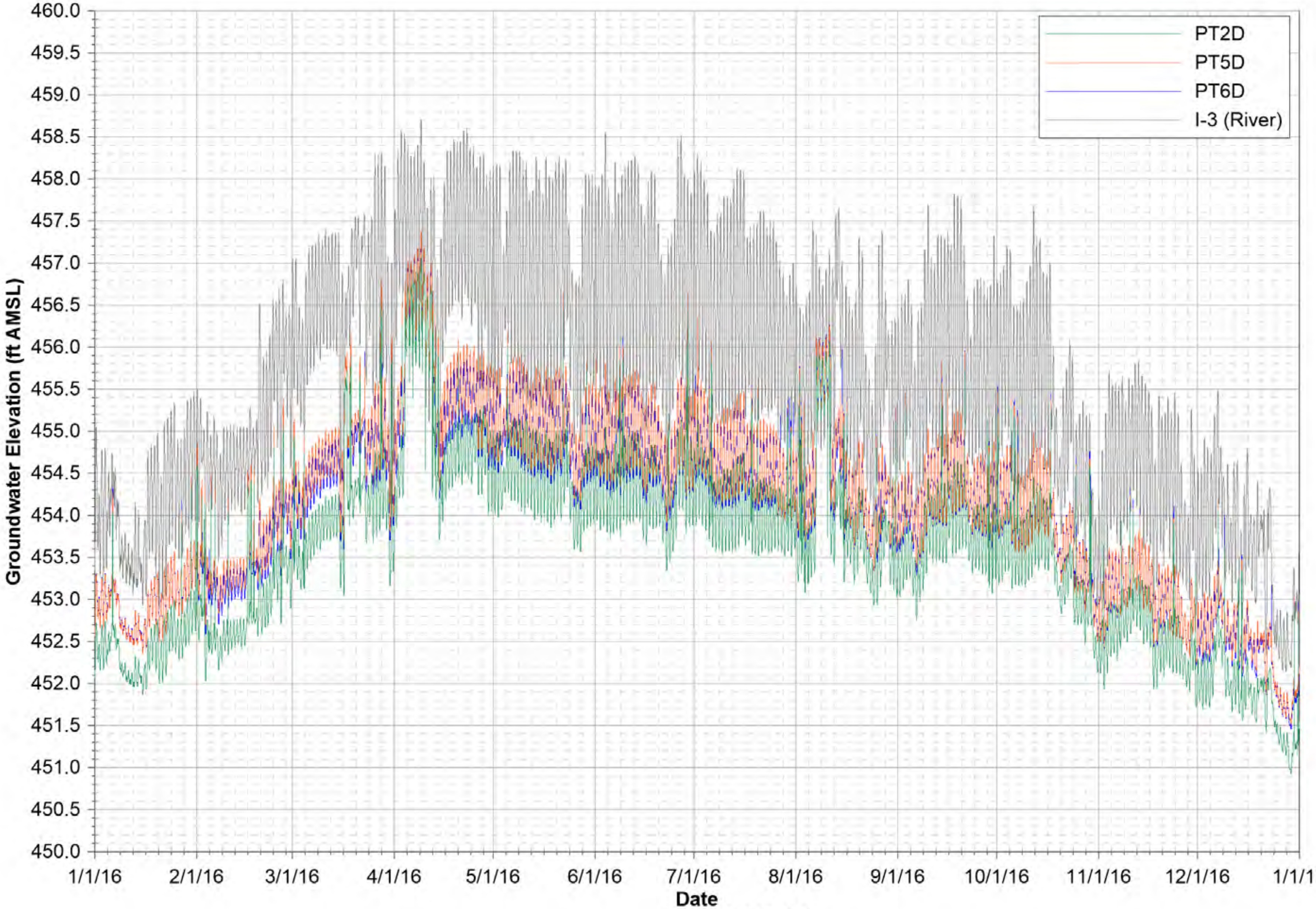
Notes:
1. Data subject to review.
2. ft amsl = feet above mean sea level.

FIGURE E-1U

MW-51 HYDROGRAPHS

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS



Note:
1. Data subject to review.
2. ft amsl = feet above mean sea level.

FIGURE E-1V

INSITU PILOT STUDY WELL HYDROGRAPHS

FOURTH QUARTER 2016 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS

APPENDIX F

Groundwater Monitoring Data for Groundwater Monitoring Program and Performance Monitoring Program

Table F-1

Chemical Performance Monitoring Analytical Results, March 2005 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

Location ID	Sample Date	Total Dissolved Solids (mg/L)	Oxygen-18 (0/00)	Deuterium (00/00)	Chloride (mg/L)	Sulfate (mg/L)	Nitrate (mg/L)	Bromide (mg/L)	Alkalinity (total) (mg/L)	Total Dissolved Solids (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Boron (mg/L)
MW-20-070	3/10/2005	1,940	-7.1	-59	740	378	--	ND (1)	81.7	ND (1)	198	55.4	9.89	431	0.412
MW-20-070	6/15/2005 FD	2,050	-8.3	-57	760	392	--	ND (1)	71.3	ND (1)	204	60.7	11.4	468	0.445
MW-20-070	6/15/2005	1,980	-7	-60	749	388	--	ND (1)	73.8	ND (1)	189	55.4	10.5	433	0.414
MW-20-070	10/11/2005	1,950	-7.2	-57	737	359	--	0.641	69.9	0.641	198	49.9	14.6	323	0.402
MW-20-070	12/15/2005	1,830	-7.1	-49	645	326	--	ND (1)	77.8	ND (1)	138	42.3	14.5	267	0.441
MW-20-070	3/10/2006	1,940	-7.2	-54	679	358	--	ND (0.5)	82.2	ND (0.5)	161	48.6	9.22	424	0.427
MW-20-070	5/5/2006	1,750	-8.2	-55.9	696	376	--	0.574	74.5	0.574	162	49.2	9.55	461	0.476
MW-20-070	10/3/2006 FD	1,840	-8.1	-60.5	669	352	--	ND (5)	80	ND (5)	154	45.9	9.51	466	0.515
MW-20-070	10/3/2006	1,890	-8.1	-60.4	677	357	--	ND (5)	85	ND (5)	158	47.6	9.82	472	0.535
MW-20-070	12/13/2006	1,910	-7.6	-61.2	678	352	--	0.699	77.5	0.699	149	44.3	9.09	458	0.459
MW-20-070	3/14/2007	1,740	-8.5	-64.3	689	358	--	0.641	80	0.641	139	42.2	8.83	451	0.503
MW-20-070	5/3/2007	1,750	-8.4	-66.7	697	344	--	ND (1)	77.5	ND (1)	139	41.2	8.65	390	0.477
MW-20-070	10/11/2007	1,820	-8.2	-63.9	699	367	--	ND (1)	80	ND (1)	130	39.1	11	600	0.54
MW-20-070	3/12/2008	1,790	-7.6	-65.2	695	360	--	ND (1)	77	ND (1)	139	41.2	10.7	403	0.51
MW-20-070	10/7/2008	1,900	-8.5	-64.4	650	360	--	0.61	83	0.61	136	37.9	10.5	400	0.608
MW-20-070	3/12/2009	1,900	-7.74	-60.82	670	330	--	ND (1)	79	ND (1)	128	40.2	9.95	496	0.549
MW-20-070	9/25/2009	1,700	-8.7	-66.43	700	310	--	ND (2.5)	74	ND (2.5)	130	33	9.7	390	0.42
MW-20-070	12/16/2010	1,700	-7.5	-62.3	680	320	--	0.51	79	0.51	130	33	12	400	0.51
MW-20-070	12/7/2011	1,400	-7.9	-61.9	540	330	--	ND (0.5)	71	ND (0.5)	100	25	--	380	--
MW-20-070	10/4/2012	--	--	--	430	290	--	--	--	--	76.2	22.9	--	346	--
MW-20-070	11/27/2012	1,400	-7.8	-62.6	450	300	10.6	ND (0.5)	94	ND (0.5)	79.2	22.2	8.07	350	0.484
MW-20-070	3/12/2013	--	--	--	440	290	8.6	--	100	--	82.8	22.3	--	358	--
MW-20-070	5/9/2013	--	--	--	--	--	10.1 J	--	--	--	--	--	--	--	--
MW-20-070	12/11/2013	1,200	-8.12	-63.88	390	260	8.05	ND (0.5)	91	ND (0.5)	70	17	15	580	0.51
MW-20-070	5/7/2014	--	--	--	--	--	7.15	--	--	--	--	--	--	--	--
MW-20-070	12/15/2014	1,100	-8.07	-63.1	330	230	7.7	ND (0.5)	100	ND (0.5)	49	12	4.4	310	0.43
MW-20-070	5/19/2015 FD	--	--	--	--	--	7.6	--	--	--	--	--	--	--	--
MW-20-070	5/19/2015	--	--	--	--	--	7.9	--	--	--	--	--	--	--	--
MW-20-070	12/8/2015	1,000	-7.97973	-61.7815	320	220	7	ND (1)	100	ND (1)	54	13	4.8	300	0.52
MW-20-070	4/27/2016	--	--	--	--	--	8.5	--	--	--	--	--	--	--	--
MW-20-070	12/9/2016	1,100	-7.85368	-61.8873	360	240	8	ND (0.5)	100	ND (0.5)	52 J	14 J	5.3	340	0.41
MW-20-100	3/10/2005	2,490	-5.2	-49	466	511	--	ND (1)	84.2	ND (1)	133	19.8	8.98	712	0.859
MW-20-100	6/15/2005	2,500	-4.7	-46	921	506	--	ND (1)	84	ND (1)	137	21.3	9.06	592	0.713
MW-20-100	10/11/2005	2,400	-5.3	-48	887	484	--	0.731	82.3	0.731	170	23.7	15.2	500	0.718
MW-20-100	12/15/2005	2,340	-5.4	-40	813	404	--	ND (1)	82.7	ND (1)	136	21.4	14.8	406	0.709
MW-20-100	3/10/2006	2,500	-5.6	-50.3	861	475	--	ND (0.5)	92.5	ND (0.5)	171	27	7.75	597	0.803
MW-20-100	5/5/2006	2,260	-5.1	-46.4	927	522	--	ND (1)	82.5	ND (1)	193	32	10.8	577	0.716
MW-20-100	10/3/2006	2,320	-5.8	-51.5	863	456	--	ND (5)	90	ND (5)	202	34.4	10.9 J	568	0.874
MW-20-100	12/13/2006 FD	2,200	-6.2	-54.5	874	457	--	0.851	92.5	0.851	205	32.2	9.55	575	0.881
MW-20-100	12/13/2006	1,960	-6.2	-54.4	861	459	--	0.83	97.5	0.83	205	32.2	11.4	579	0.889
MW-20-100	3/14/2007	2,180	-6.8	-57.8	847	477	--	0.785	87.5	0.785	194	31.7	9.9	521	0.715
MW-20-100	5/3/2007 FD	2,330	-6.7	-59.3	888	484	--	ND (1)	87.5	ND (1)	208	34.6	9.63 J	532	0.686
MW-20-100	5/3/2007	2,300	-7.3	-59.2	879	493	--	ND (1)	87.5	ND (1)	209	36	12 J	559	0.699
MW-20-100	10/10/2007	2,160	-7.2	-57.2	858	468	--	ND (1)	92	ND (1)	190	32	15	560	0.81
MW-20-100	3/12/2008	2,470	-6.9	-58.3	827	442	--	ND (1)	870	ND (1)	218	35.4	11.9	469	0.702
MW-20-100	10/8/2008	2,200	-7.9	-60.2	760	420	--	ND (1)	90	ND (1)	215	36.8	10.3	453	0.669
MW-20-100	3/13/2009	2,200	-7.08	-58.2	770	420	--	ND (1)	97	ND (1)	213	36.4	11.6	543	0.89
MW-20-100	9/25/2009	2,000	-7.67	-62.84	750	400	--	ND (2.5)	89	ND (2.5)	200	30	12	430	0.7
MW-20-100	2/10/2011	1,800	-7	-58.8	610	380	--	0.57	120	0.57	180	28	14	400	0.81

Table F-1

Chemical Performance Monitoring Analytical Results, March 2005 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

Location ID	Sample Date		Total Dissolved Solids (mg/L)	Oxygen-18 (0/00)	Deuterium (00/00)	Chloride (mg/L)	Sulfate (mg/L)	Nitrate (mg/L)	Bromide (mg/L)	Alkalinity (total) (mg/L)	Total Dissolved Solids (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Boron (mg/L)
MW-20-100	12/8/2011		1,700	-6.7	-55.6	580	380	--	ND (0.5)	120	ND (0.5)	170	25	--	390	--
MW-20-100	10/4/2012		--	--	--	570	390	--	--	--	--	157	27.8	--	400	--
MW-20-100	11/29/2012		1,700	-7	-56.6	570	360	14.2	ND (0.5)	110	ND (0.5)	149	30.6	9.64	376	0.952
MW-20-100	3/13/2013		--	--	--	560	370	6.5	--	120	--	164	27.8	--	388	--
MW-20-100	5/9/2013		--	--	--	--	--	14 J	--	--	--	--	--	--	--	--
MW-20-100	12/11/2013		1,600	-7.46	-55.86	550	290	9.5	ND (0.5)	110	ND (0.5)	140	23	8.2	400	1
MW-20-100	5/7/2014		--	--	--	--	--	11.1	--	--	--	--	--	--	--	--
MW-20-100	12/15/2014		1,500	-7.62	-60.2	530	260	8.9	ND (0.5)	120	ND (0.5)	120	18	6.4	340	0.76
MW-20-100	5/19/2015		--	--	--	--	--	9.6	--	--	--	--	--	--	--	--
MW-20-100	12/8/2015		1,300	-7.60373	-60.1171	510	240	7.3	ND (1)	110	ND (1)	120	20	7	340	0.92
MW-20-100	4/27/2016		--	--	--	--	--	8.6	--	--	--	--	--	--	--	--
MW-20-100	12/9/2016		1,300	-7.9278	-61.9035	500	250	8.1	0.62	130	0.62	110 J	19 J	7.2	330	0.83
MW-20-130	3/2/2005		5,270 J	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-20-130	3/9/2005	FD	6,200	-5.4	-51	3,080	1,080	--	ND (1)	68.9	ND (1)	231	12.8	25.4	2,390	1.99
MW-20-130	3/9/2005		5,520	-5.8	-56	3,120	1,080	--	ND (1)	68.9	ND (1)	219	12.1	24.7	2,250	1.9
MW-20-130	6/15/2005		7,790	-5	-48	3,410	1,230	--	ND (1)	68.7	ND (1)	352	23.2	31.3	2,980	2.75
MW-20-130	10/7/2005		7,330	-5	-47	3,010	1,210	--	1.04 J	72.4	1.04 J	349	13.9	38.4	2,070	2.41
MW-20-130	12/16/2005		7,860	-5.8	-43	3,260	1,000	--	ND (2.5)	63.2	ND (2.5)	324	16.3	44.4	1,780	1.98
MW-20-130	3/10/2006		8,610	-5.5	-48.8	3,370	1,250	--	ND (0.5)	74.5	ND (0.5)	312	18.9	27.7	2,730	2.03
MW-20-130	5/5/2006		7,700	-5.3	-47.2	3,900	1,280	--	ND (1)	69.2	ND (1)	349	20.3	27.7	2,810	2.4
MW-20-130	10/18/2006		8,450	-6.3	-51.4	3,680	1,100	--	ND (5)	70	ND (5)	358	20.9	28	2,870	2.28
MW-20-130	12/13/2006	FD	8,250	-5.9	-54.4	3,950	1,260	--	1.09	72.5	1.09	328	19.1	27.3	2,830	2.24
MW-20-130	12/13/2006		7,890	-6	-54.9	3,970	1,250	--	0.896	72.5	0.896	335	19.7	27.6	2,900	2.31
MW-20-130	3/8/2007	FD	8,510	-6.6	-57.4	3,900	1,210	--	1.06	72.5	1.06	351	21.3	26.8	2,750	2.19
MW-20-130	3/8/2007		8,450	-6.5	-57.7	3,930	1,240	--	1.08	70	1.08	353	21.3	27	2,760	2.24
MW-20-130	5/3/2007	FD	8,100	-6.9	-60.1	3,950	1,290	--	ND (1)	72.5	ND (1)	338	21.9	27.3	2,550	2.47
MW-20-130	5/3/2007		8,150	-7.7	-60	4,020	1,310	--	ND (1)	75	ND (1)	338	22.5	27.8	2,550	2.49
MW-20-130	10/5/2007		7,980	-7	-57.5	3,670	1,070	--	ND (1)	77	ND (1)	310	19	31	2,900	2.4
MW-20-130	3/12/2008		8,460	-6.2	-58.7	3,690	1,220	--	ND (1)	75	ND (1)	342	23.4	47	2,260	2.07
MW-20-130	10/8/2008		7,800	-7.3	-59.6	3,500	1,200	--	ND (2.5)	81	ND (2.5)	329	22	40.1	1,990	2.23
MW-20-130	3/13/2009		8,100	-6.58	-56.41	3,600	1,100	--	ND (2.5)	79	ND (2.5)	350	22.7	41.4	2,550	2.16
MW-20-130	9/25/2009		6,500	-7.59	-61.74	3,500	1,100	--	ND (2.5)	76	ND (2.5)	280	17	33	2,400	2
MW-20-130	2/10/2011		5,900	-6.6	-59	3,100	1,100	--	1	80	1	310	18	50	2,100	2.2
MW-20-130	12/9/2011		6,200	-6.6	-57.2	3,300	1,200	--	ND (2.5)	74	ND (2.5)	340	22	33	2,400	2.4
MW-20-130	10/9/2012		--	--	--	3,200	1,100	--	--	92	--	294	25.8	--	2,140	--
MW-20-130	11/29/2012	FD	7,400	-6.6	-60.4	3,400	1,100	18.6	ND (2.5)	96	ND (2.5)	315	29.2	32.9	2,410	2.06
MW-20-130	11/29/2012		7,400	-6.6	-59.5	3,300	1,100	19.4	ND (2.5)	98	ND (2.5)	286	28.7	32.7	2,310	2.13
MW-20-130	12/12/2012	FD	--	--	--	3,000	1,100	--	--	81	--	--	--	--	--	--
MW-20-130	12/12/2012		--	--	--	3,000	1,100	--	--	83	--	--	--	--	--	--
MW-20-130	3/14/2013		--	--	--	3,400	1,100	7.91	--	100	--	331	30.9	--	2,260	--
MW-20-130	5/14/2013		--	--	--	--	--	13	--	--	--	--	--	--	--	--
MW-20-130	12/17/2013	FD	7,300	-6.52	-59.15	3,200	1,100	12.9	ND (1)	78	ND (1)	330	21	27	2,400	2.7
MW-20-130	12/17/2013		7,400	-6.4	-57.69	3,200	1,100	12.4	ND (1)	80	ND (1)	330	22	26	2,300	2.3
MW-20-130	5/12/2014		--	--	--	--	--	12.9	--	--	--	--	--	--	--	--
MW-20-130	12/15/2014	FD	6,800	-6.76	-59.6	2,900	1,100	15	ND (2.5)	85	ND (2.5)	290	20	21	1,700	1.8
MW-20-130	12/15/2014		6,900	-6.7	-59.6	2,800	1,100	14	ND (2.5)	85	ND (2.5)	310	21	24	1,800	1.9
MW-20-130	5/19/2015		--	--	--	--	--	14	--	--	--	--	--	--	--	--
MW-20-130	12/8/2015	FD	6,600	-6.62848	-58.2233	3,100	1,100	13	ND (2.5)	80	ND (2.5)	320	19	25	2,400	2.6
MW-20-130	12/8/2015		7,100	-6.41678	-58.0354	3,300	1,000	12	ND (2.5)	76	ND (2.5)	320	19	25	2,400	2.5

Table F-1

Chemical Performance Monitoring Analytical Results, March 2005 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

Location ID	Sample Date		Total Dissolved Solids (mg/L)	Oxygen-18 (0/00)	Deuterium (00/00)	Chloride (mg/L)	Sulfate (mg/L)	Nitrate (mg/L)	Bromide (mg/L)	Alkalinity (total) (mg/L)	Total Dissolved Solids (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Boron (mg/L)
MW-20-130	4/27/2016		--	--	--	--	--	10	--	--	--	--	--	--	--	--
MW-20-130	12/9/2016	FD	7,100	-6.81648	-60.3119	3,400	1,100	11	ND (2.5)	79	ND (2.5)	250 J	14 J	31	2,700	2.4
MW-20-130	12/9/2016		7,000	-6.88176	-60.0955	3,400	1,100	12	ND (2.5)	77	ND (2.5)	260 J	16 J	30	2,600	2.3
MW-25	3/9/2005		877	-8.4	-62	247	169	--	ND (0.5)	158	ND (0.5)	77.6	16.1	6.24	211	0.441
MW-25	6/14/2005	FD	980	-7.2	-59	294	185	--	ND (0.5)	137	ND (0.5)	100	20.9	9.06	268	0.475
MW-25	6/14/2005		942	-8.6	-61	289	183	--	ND (0.5)	137	ND (0.5)	93.5	20	8.91	253	0.464
MW-25	10/4/2005	FD	910	-8.3	-60	251	171	--	ND (0.5)	146	ND (0.5)	94.6	15.3	10.2	185	0.371
MW-25	10/4/2005		950	-8.2	-68	252	171	--	ND (0.5)	141	ND (0.5)	83.3	14.9	9.93	164	0.362
MW-25	12/14/2005	FD	896	-8.4	-50	219	155	--	ND (0.5)	156	ND (0.5)	73	14.1	9.71	151	0.382
MW-25	12/14/2005		838	-8.4	-55	224	158	--	ND (0.5)	153	ND (0.5)	75.5	14.5	9.8	143	0.396
MW-25	3/9/2006		910	-8.4	-64.1	245	164	--	ND (0.5)	170	ND (0.5)	76.4	15.6	6.97	210	0.39
MW-25	5/3/2006	FD	924	-9	-61	274	173	--	ND (0.5)	155	ND (0.5)	79.7	17.8	7.53	245	0.431
MW-25	5/3/2006		907	-9	-59.4	272	172	--	ND (0.5)	150	ND (0.5)	78	17.3	7.38	222	0.418
MW-25	10/3/2006		892	-8.9	-62.7	222	158	--	ND (0.5)	163	ND (0.5)	73.3	15	7.25	206	0.466
MW-25	3/6/2007		843	-9	-66.9	221	164	--	ND (0.5)	160	ND (0.5)	72.9	14.4	6.85	203	0.459
MW-25	10/2/2007	FD	758	-9	-65.7	195	157	--	ND (1)	190	ND (1)	63	13	7.7	220	0.46
MW-25	10/2/2007		796	-9	-65.8	189	155	--	ND (1)	180	ND (1)	66	14	7.9	200	0.49
MW-25	10/7/2008	FD	730	-10.1	-69.1	170	150	--	ND (0.5)	210	ND (0.5)	58.4	12.9	10.2	144	0.559
MW-25	10/7/2008		740	-9.9	-68.5	170	150	--	ND (0.5)	200	ND (0.5)	59.2	12.9	9.89	143	0.559
MW-25	9/21/2009	FD	650	-8.87	-69.45	180	130	--	ND (0.5)	200	ND (0.5)	64	12	7.9	190	0.47
MW-25	9/21/2009		660	-8.91	-69.89	180	130	--	ND (0.5)	200	ND (0.5)	64	12	7.2	180	0.46
MW-25	12/7/2010		780	-9.4	-68.9	220	120	--	ND (1)	180	ND (1)	74	15	10	180	0.43
MW-25	12/15/2011	FD	890	-8.9	-66.7	280	120	--	ND (0.5)	170	ND (0.5)	91	19	8	220	0.5
MW-25	12/15/2011		860	-9.2	-68.6	270	120	--	ND (1)	170	ND (1)	89	19	8.5	210	0.49
MW-25	12/11/2012		970	-9.1	-67.6	340	140	7.25	ND (0.5)	160	ND (0.5)	90	19	7.9	200	0.38
MW-25	12/9/2013		980	-9.02	-68.72	310	140	6.99	ND (0.5)	160	ND (0.5)	98	20	8.2	220	0.43
MW-25	12/2/2014		970	-9.21	-67.9	350	140	8.9	ND (0.5)	150	ND (0.5)	100	19	7.7	210	0.39
MW-25	5/11/2015		--	--	--	--	--	9.2	--	--	--	--	--	--	--	--
MW-25	12/7/2015		1,000	-8.99177	-67.0607	340	150	10	ND (0.5)	140	ND (0.5)	110	21	7.9	230	0.42
MW-25	4/27/2016		--	--	--	--	--	9.7	--	--	--	--	--	--	--	--
MW-25	12/8/2016		1,100	-8.78942	-65.8821	380	180	9.3	ND (0.5)	130	ND (0.5)	110 J	22	8.4	220	0.41 U
MW-26	3/8/2005	FD	1,800	-8.7	-70	708	338	--	ND (0.5)	96.1	ND (0.5)	166	40.9	11.4	438	0.559
MW-26	3/8/2005		1,840	-8.8	-70	756	370	--	ND (0.5)	98.7	ND (0.5)	166	41.6	10.7	439	0.557
MW-26	6/13/2005		2,130	-8.2	-65	847	371	--	ND (0.5)	103	ND (0.5)	178	44.6	14	511	0.663
MW-26	10/4/2005		2,120	-7.8	-68	779	372	--	0.601	109	0.601	166	40.4	19.8	352	0.526
MW-26	12/12/2005		2,610	-8.5	-55	788	372	--	0.546	99.7	0.546	162	39.9	20.3	349	0.613
MW-26	3/8/2006		2,070	-8.6	-60.4	772	324	--	ND (0.5)	121	ND (0.5)	155	38.1	11.7	434 J	0.621
MW-26	5/1/2006		2,130	-8.9	-62.7	927	382	--	ND (0.5)	121	ND (0.5)	165	42	12.8	555	0.723
MW-26	10/3/2006		2,220	-8.8	-63	894	370	--	ND (2.5)	105	ND (2.5)	170	43.9	12.8	510	0.692
MW-26	3/12/2007		2,280	-9	-67	917	387	--	0.646	90	0.646	163	41.6	12.9	621	0.622
MW-26	10/2/2007		2,180	-8.6	-66.3	945	391	--	ND (1)	100	ND (1)	170	42	15	620	0.66
MW-26	3/12/2008	FD	2,420	-8.9	-68.2	905	398	--	ND (1)	102	ND (1)	160	32.8 J	12.7 J	462	0.601
MW-26	3/12/2008		2,500	-8.1	-67.2	908	398	--	ND (1)	103	ND (1)	176	44.1 J	16.2 J	498	0.589
MW-26	10/8/2008		2,400	-8.7	-66.5	930	440	--	ND (1)	110	ND (1)	183	45.8	14.6	555	0.591
MW-26	3/10/2009	FD	2,300	-8.68	-65.76	860	440 J	--	1.5	100	1.5	174	46.2	15.6	631	0.65
MW-26	3/10/2009		2,300	-8.41	-65.3	870	440 J	--	1.4	100	1.4	172	47.9	14.8	585	0.604
MW-26	9/22/2009		2,200	-9.04	-68.25	870	450	--	ND (1)	100	ND (1)	170	39	14	550	0.59
MW-26	12/15/2010		--	--	--	900	480	--	--	100	--	180	40	--	560	--
MW-26	12/9/2011		2,300	-8.1	-65.2	930	530	--	1.2	94	1.2	210	47	15	690	0.89

Table F-1

Chemical Performance Monitoring Analytical Results, March 2005 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California

Location ID	Sample Date		Total Dissolved Solids (mg/L)	Oxygen-18 (0/00)	Deuterium (00/00)	Chloride (mg/L)	Sulfate (mg/L)	Nitrate (mg/L)	Bromide (mg/L)	Alkalinity (total) (mg/L)	Total Dissolved Solids (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Boron (mg/L)
MW-26	10/4/2012		--	--	--	960	550	--	--	--	--	178	46.2	--	702	--
MW-26	11/27/2012		--	--	--	960	570	18.1	--	110	--	168	45	--	671	--
MW-26	3/12/2013		--	--	--	950	560	19.5	--	100	--	186	48.7	--	705	--
MW-26	5/7/2013		--	--	--	--	--	17.7 J	--	--	--	--	--	--	--	--
MW-26	12/4/2013		2,600	-8.41	-64.08	890	520	18	1	110	1	160	41	12	670	0.93
MW-26	5/5/2014		--	--	--	--	--	20.4	--	--	--	--	--	--	--	--
MW-26	12/15/2014	FD	2,700	-8.31	-66.9	910	530	22	1	110	1	150	34	--	450	0.82
MW-26	12/15/2014		2,700	-8.33	-67.3	910	530	21	1.1	110	1.1	150	33	--	470	0.79
MW-26	5/19/2015		--	--	--	--	--	23	--	--	--	--	--	--	--	--
MW-26	12/8/2015	FD	2,500	-7.93156	-65.0305	870	520	20	ND (1)	110	ND (1)	140	30	14	640	0.81
MW-26	12/8/2015		2,400	-8.19913	-65.4939	890	500	20	ND (1)	110	ND (1)	140	32	13	640	0.86
MW-26	4/28/2016		--	--	--	--	--	21	--	--	--	--	--	--	--	--
MW-26	12/8/2016	FD	2,500	-7.98162	-65.5157	880	520	21	ND (2.5)	120	ND (2.5)	160 J	42	13	680	1.1
MW-26	12/8/2016		2,400	-7.9186	-65.4433	890	520	22	ND (2.5)	120	ND (2.5)	160 J	41	13	650	1.1
MW-27-020	3/8/2005		1,250	-12	-102	190	432	--	ND (0.5)	215	ND (0.5)	137	56.6	4.89	195	ND (0.2)
MW-27-020	7/18/2005		--	-11.9	-98	81.9	228	--	ND (0.5)	160	ND (0.5)	96.1	30.1	4.27	94.8	ND (0.2)
MW-27-020	10/5/2005		742	-11.8	-102	91.1	252	--	ND (0.5)	175	ND (0.5)	88.6	31.4	5.48	81	ND (0.2)
MW-27-020	12/14/2005		1,020	-11.7	-91	118	347	--	ND (0.5)	216	ND (0.5)	116	41.8	6.96	116	ND (0.2)
MW-27-020	3/6/2006		664	-12.1	-90.9	89.7	231	--	ND (0.2)	385	ND (0.2)	89.1	28.8	4.9	103	ND (0.2)
MW-27-020	6/14/2006		730	-12	-89.8	98.3	272	--	ND (0.5)	195	ND (0.5)	91.1	28.5	2.79 J	96.9	ND (0.2)
MW-27-020	10/3/2006		600	-13.1	-96.6	90.8	261	--	ND (0.5)	160	ND (0.5)	102	34.5	6.45	113	ND (0.2)
MW-27-020	10/2/2007		802	-12.5	-96.3	102	320	--	ND (1)	170	ND (1)	97	34	5.3	150	0.22
MW-27-020	10/3/2008		--	--	--	94	240	--	--	--	--	87.9	29.5	--	110	--
MW-27-020	10/1/2009		--	--	--	88	230	--	--	130	--	84	25	--	87	--
MW-27-020	12/7/2010		--	--	--	86	220	--	--	200	--	87	29	--	93	--
MW-27-020	12/5/2011		--	--	--	83	220	--	--	150	--	83	25	--	83	--
MW-27-020	12/3/2012		--	--	--	76	210	ND (0.01)	--	150	--	76	24	--	76	--
MW-27-020	4/15/2013		--	--	--	--	--	ND (0.5)	--	--	--	--	--	--	--	--
MW-27-020	11/4/2013		--	--	--	76	210	ND (0.01)	--	150	--	73 J	23	--	80	--
MW-27-020	4/14/2014		--	--	--	--	--	0.265	--	--	--	--	--	--	--	--
MW-27-020	11/4/2014		650	--	--	84	220	ND (0.05)	ND (0.5)	150	ND (0.5)	78	23	--	89	0.1
MW-27-020	12/3/2015		680	--	--	92	250	ND (0.05)	ND (0.5)	150	ND (0.5)	74	22	--	100	0.13
MW-27-020	12/6/2016		680	--	--	96	250	ND (0.05)	ND (0.5)	140	ND (0.5)	78	27	--	100	0.1
MW-28-025	3/10/2005		880	-12.2	-95	112	302	--	ND (0.5)	204	ND (0.5)	129	36.3	3.5	122	ND (0.2)
MW-28-025	6/15/2005		974	-11.6	-91	108	359	--	ND (0.5)	221	ND (0.5)	133	38.9	6.54	117	ND (0.2)
MW-28-025	10/6/2005		884	-11.7	-95	99.8	300	--	ND (0.5)	197	ND (0.5)	123	37	6.61	88.7	ND (0.2)
MW-28-025	12/16/2005		1,010	-11.4	-90	128	348	--	ND (0.5)	212	ND (0.5)	134	41.5	6.46	107	ND (0.2)
MW-28-025	3/9/2006		746	-11.5	-93.9	84.4	225	--	ND (0.5)	244	ND (0.5)	98.5	27.5	4.15 J	88.5	ND (0.2)
MW-28-025	5/5/2006		741	-11.4	-90.3	110	302	--	ND (0.5)	216	ND (0.5)	117	35.7	5.77	118	ND (0.2)
MW-28-025	10/11/2006		1,050	-12.2	-95	86.3	247	--	ND (0.5)	225	ND (0.5)	133	40.8	5.47	132	ND (0.2)
MW-28-025	10/4/2007		812	-12.1	-98.7	110	307	--	ND (1)	230	ND (1)	120	37 J	4.8	150	0.26 J
MW-28-025	10/8/2008		--	--	--	100	280	--	--	220	--	109	34.7	--	102	--
MW-28-025	9/24/2009		--	--	--	94	240	--	--	200	--	100	27	--	100 J	--
MW-28-025	12/8/2010		--	--	--	90	230	--	--	190	--	110	31	--	95	--
MW-28-025	12/12/2011		--	--	--	97	260	--	--	200	--	110	33	--	96	--
MW-28-025	12/5/2012		--	--	--	87	240	0.0128	--	200	--	93	29	--	86	--
MW-28-025	4/18/2013		--	--	--	--	--	ND (0.5)	--	--	--	--	--	--	--	--
MW-28-025	11/5/2013		--	--	--	1,900	580	ND (0.01)	--	250	--	100	29	--	83	--
MW-28-025	4/15/2014		--	--	--	--	--	ND (0.01)	--	--	--	--	--	--	--	--

Table F-1

Chemical Performance Monitoring Analytical Results, March 2005 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,

PG&E Topock Compressor Station, Needles, California

Location ID	Sample Date		Total Dissolved Solids (mg/L)	Oxygen-18 (0/00)	Deuterium (00/00)	Chloride (mg/L)	Sulfate (mg/L)	Nitrate (mg/L)	Bromide (mg/L)	Alkalinity (total) (mg/L)	Total Dissolved Solids (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Boron (mg/L)
MW-28-025	11/11/2014		730	--	--	91	250	ND (0.05	ND (0.5)	200	ND (0.5)	100	27	--	86	0.14
MW-28-025	4/21/2015		--	--	--	--	--	ND (0.05	--	--	--	--	--	--	--	--
MW-28-025	12/2/2015		750	--	--	96	260	ND (0.05	ND (0.5)	190	ND (0.5)	92	26	--	110	0.13
MW-28-025	4/26/2016		--	--	--	--	--	ND (0.05	--	--	--	--	--	--	--	--
MW-28-025	12/8/2016		780	--	--	110	280	ND (0.05	ND (0.5)	210	ND (0.5)	98 J	30	--	120	0.23 U
MW-30-030	3/10/2005		38,800	-9.8	-79	16,000	4,270	--	7.91	421	7.91	1,590	1,600	95.4	13,600	4.97
MW-30-030	10/7/2005		36,400	-8.5	-75	17,600	4,000	--	ND (10)	521	ND (10)	1,020	842	93.6	7,650	5.2
MW-30-030	12/15/2005		35,700	-8.7	-59	19,700	4,070	--	3.13	504	3.13	1,060	894	110	8,540	6.14
MW-30-030	3/13/2006		39,700 J	-8.8	-70.5	18,600	4,530	--	ND (50)	650	ND (50)	1,050	892	77.2	11,300	4.62
MW-30-030	5/2/2006		32,400	-10.3	-70.7	15,400	3,300	--	ND (5)	756	ND (5)	882	828	59.4	10,280	3.95
MW-30-030	10/10/2006		29,400	-9.4	-68.7	17,800	4,400	--	ND (2.5)	550	ND (2.5)	729	653	55	10,200	4.32
MW-30-030	10/8/2007		27,400	-9	-73.9	13,700	3,370	--	3.88	800	3.88	650	540	56	9,600	4.5
MW-30-030	9/24/2009		--	--	--	5,800	1,700	--	--	550	--	280	220	--	3,800	--
MW-30-030	12/7/2010		--	--	--	7,200	1,900	--	--	790	--	390	290	--	4,800	--
MW-30-030	12/7/2011		--	--	--	10,000	3,200	--	--	910	--	340	290	--	6,300	--
MW-30-030	12/3/2012		--	--	--	8,700	3,400	0.0269	--	1,500	--	300	260	--	7,000	--
MW-30-030	4/15/2013	FD	--	--	--	--	--	ND (0.5)	--	--	--	--	--	--	--	--
MW-30-030	4/15/2013		--	--	--	--	--	ND (0.5)	--	--	--	--	--	--	--	--
MW-30-030	11/4/2013		--	--	--	1,200	600	0.0174	--	470	--	52	37	--	1,100	--
MW-30-030	4/14/2014		--	--	--	--	--	0.0153	--	--	--	--	--	--	--	--
MW-30-030	11/10/2014		5,800	--	--	2,200	1,700	ND (0.05	0.7	970	0.7	130	85	--	2,300	2.2
MW-30-030	12/3/2015		9,300	--	--	2,700	2,600	0.06	ND (2.5)	1,600	ND (2.5)	220	160	--	3,300	3.3
MW-30-030	12/6/2016		12,000	--	--	3,000	3,700	ND (0.1)	ND (1)	2,000	ND (1)	120 J	110	--	5,000	3
MW-30-050	3/10/2005		6,470 J	-8.3	-68	4,660	672	--	1.03	324	1.03	335	107	16.5	2,040	1.15
MW-30-050	10/7/2005		6,860	-9.4	-79	3,060	857	--	0.899 J	252	0.899 J	438	101	37	1,780	1.27
MW-30-050	12/16/2005		5,850	-10.5	-65	2,360	578	--	0.645	212	0.645	265	77.9	32.9	1,260	1.19
MW-30-050	3/9/2006		5,380	-9.8	-83.5	2,420	651	--	ND (0.5)	275	ND (0.5)	226	66.2	14.6	1,640	1.18
MW-30-050	5/2/2006		5,420	-10.4	-73.6	2,380	612	--	3.41	261	3.41	243	70.3	16.4	1,750	1.22
MW-30-050	10/11/2006	FD	3,930	-11	-82.6	1,810	462	--	ND (0.5)	298	ND (0.5)	163	46.1	14.1	1,340	1.08
MW-30-050	10/11/2006		4,170	-10.7	-82.2	1,980	468	--	ND (0.5)	290	ND (0.5)	171	48.5	14	1,370	1.11
MW-30-050	9/24/2009		--	--	--	--	--	--	--	220	--	19	4.8	--	270	--
MW-30-050	12/7/2010		--	-12.2	-97.5	140	220	--	--	200	--	15	4.2	--	260	--
MW-30-050	12/8/2011		--	-12.3	-98.2	130	210	--	--	200	--	34	9.4	--	240	--
MW-30-050	12/3/2012		--	-12.5	-103.2	110	200	ND (0.01	--	190	--	46	13	--	170	--
MW-30-050	11/4/2013		--	-12.63	-100.98	110	200	ND (0.01	--	200	--	57	15	--	160	--
MW-30-050	11/10/2014	FD	700	-12.51	-102.5	120	200	ND (0.05	ND (0.5)	160	ND (0.5)	64	15	--	140	0.18
MW-30-050	11/10/2014		700	-12.42	-104.02	120	200	ND (0.05	ND (0.5)	190	ND (0.5)	64	15	--	140	0.16
MW-30-050	12/3/2015	FD	660	-12.79	-102.79	94	190	ND (0.05	ND (0.5)	190	ND (0.5)	77	18	--	120	0.19
MW-30-050	12/3/2015		660	-13.31	-103.4	95	190	ND (0.05	ND (0.5)	180	ND (0.5)	77	18	--	170	0.19
MW-30-050	12/6/2016		670	-12.8028	-101.679	90	210	ND (0.05	ND (0.5)	190	ND (0.5)	82 J	19	--	100	0.16 U
MW-31-060	3/9/2005		1,540	-8.6	-63	649	210	--	ND (0.5)	76.6	ND (0.5)	108	17.3	5.97	424	0.401
MW-31-060	6/13/2005		1,660	-8.2	-65	745	207	--	ND (0.5)	70	ND (0.5)	121	18.9	6.57	403	0.388
MW-31-060	10/6/2005		1,660	-8.6	-65	691	206	--	ND (0.5)	77.3	ND (0.5)	109	16.5	9.75	308	0.462
MW-31-060	12/13/2005		1,620	-8.7	-54	669	199	--	ND (0.5)	73	ND (0.5)	87	15.4	9.32	275	0.359
MW-31-060	3/15/2006	FD	1,640 J	-8.6	-64.9	662	192	--	ND (0.5)	81.9	ND (0.5)	101	16.8	6.94	391	0.383
MW-31-060	3/15/2006		1,560 J	-8.6	-65.6	661	191	--	ND (0.5)	89.3	ND (0.5)	106	17.5	7.3	403	0.393
MW-31-060	5/1/2006		1,630	-9.6	-63.2	691	209	--	ND (0.5)	79.6	ND (0.5)	118	20.1	7.78	467	0.449
MW-31-060	10/5/2006		1,620	-9.4	-66.3	687	205	--	ND (0.5)	80	ND (0.5)	113	20.6	9.6 J	325	0.464
MW-31-060	3/12/2007		1,750	-9.3	-69	757	222	--	ND (0.5)	72.5	ND (0.5)	116	20.3	6.05	454	0.402 J

Table F-1

Chemical Performance Monitoring Analytical Results, March 2005 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

Location ID	Sample Date		Total Dissolved Solids (mg/L)	Oxygen-18 (0/00)	Deuterium (00/00)	Chloride (mg/L)	Sulfate (mg/L)	Nitrate (mg/L)	Bromide (mg/L)	Alkalinity (total) (mg/L)	Total Dissolved Solids (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Boron (mg/L)
MW-31-060	10/4/2007		1,720	-9.4	-69.6	799	208	--	ND (1)	80	ND (1)	150	26	7.3	580	0.64
MW-31-060	10/6/2008		2,000	-10.2	-72.2	810	240	--	ND (1)	81	ND (1)	150	26	9.39	460	0.399
MW-31-060	9/21/2009		1,800	-9.23	-72.11	870	220	--	ND (1)	75	ND (1)	160	26	9.6	480	0.43
MW-31-060	12/15/2010		2,000	-9	-69.3	840	210	--	ND (0.5)	78	ND (0.5)	170	27	12	440	0.43
MW-31-060	12/6/2011		1,800	-8.8	-67.9	790	200	--	ND (1)	76	ND (1)	150	24	7.6	450	0.54
MW-31-060	11/13/2012		1,900	-9.2	-71.8	890	200	3.3	ND (0.5)	78	ND (0.5)	150	24	7.1	470	0.44
MW-31-060	12/3/2013		1,900	-8.56	-66.39	870	220	3.53	ND (0.5)	78	ND (0.5)	140	24	6.4	520	0.48
MW-31-060	12/3/2014		1,700	-8.83	-68.5	790	210	3.9	ND (0.5)	140	ND (0.5)	120	19	5.2	430	0.4
MW-31-060	12/7/2015		1,600	-8.2946	-64.5767	620	200	4.7	ND (0.5)	92	ND (0.5)	100	17	5.4	470	0.5
MW-31-060	4/27/2016		--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-31-060	12/9/2016	FD	1,700	-8.65932	-66.0943	760	220	4.1	ND (1)	93	ND (1)	120 J	22 J	6.6	470	0.42
MW-31-060	12/9/2016		1,700	-8.48888	-66.636	750	210	4.1	ND (0.5)	91	ND (0.5)	120 J	20 J	6.2	470	0.42
MW-32-020	3/9/2005		12,500	-7.2	-65	6,930	1,660	--	3.51	123	3.51	838	302	36.9	4,000	2.76
MW-32-020	6/17/2005		10,200	-9	-67	4,810	690	--	ND (2.5)	676	ND (2.5)	566	231	23.3	2,620	1.75
MW-32-020	10/4/2005		28,800	-7.8	-65	14,200	2,420	--	6.19	733	6.19	1,380 J	613 J	91.1 J	5,400 J	4.75 J
MW-32-020	12/16/2005		24,600	-7.8	-61	12,200	2,140	--	3.48	861	3.48	1,470	552	90.4	4,950	4.16
MW-32-020	3/10/2006		20,900	-8.3	-65.5	10,600	1,970	--	ND (0.5)	432	ND (0.5)	1,350	530	56.1	6,440	3.54
MW-32-020	5/4/2006		16,900	-8.1	-64.9	9,430	1,380	--	2.35	218	2.35	937	445	46	4,780	2.87
MW-32-020	10/2/2006		46,200 J	-8.6	-67.1	20,200	3,190	--	7.3	660	7.3	1,870	1,070	87	11,300	6.34
MW-32-020	12/11/2006		37,900	-8	-67	17,900	3,020	--	7.67	825	7.67	1,530	785	81.7	8,420	4.98
MW-32-020	3/6/2007		27,600	-8.7	-72.7	16,200	2,210	--	5.93	765	5.93	1,460	635	64.4	7,110	3.92
MW-32-020	4/30/2007		17,700	-9.6	-78.1	9,820	1,310	--	3.78	770	3.78	965	484	51.4	5,520	3.02
MW-32-020	10/1/2007		37,200	-8.3	-70.1	20,600	3,160	--	6.44	700	6.44	1,800	1,100	93	9,900	5.7
MW-32-020	3/10/2008		26,000	-9.4	-72.6	15,800	2,280	--	5.66	800	5.66	1,190	710	67.4	11,600	2.31
MW-32-020	10/3/2008		--	--	--	21,000	3,500	--	--	640	--	1,700	1,080	--	9,550	--
MW-32-020	3/10/2009		29,000	-8.91	-70.47	15,000	2,100 J	--	15	750	15	1,620	970	96.6	7,020	3.53
MW-32-020	9/22/2009		--	--	--	20,000	3,600	--	--	730	--	1,800	740	--	9,300	--
MW-32-020	12/8/2010		--	--	--	17,000	4,100	--	--	830	--	1,600	720	--	11,000	--
MW-32-020	12/8/2011		--	--	--	17,000	4,400	--	--	1,000	--	1,400	670	--	11,000	--
MW-32-020	12/5/2012		--	--	--	15,000	6,000	1.16	--	--	--	900	500	--	9,800	--
MW-32-020	12/16/2013		--	--	--	13,000	5,400	0.0427	--	1,500	--	970	530	--	11,000	--
MW-32-020	12/3/2015	FD	27,000	--	--	10,000	6,700	--	ND (10)	2,300	ND (10)	560	390	--	8,700	7.1
MW-32-020	12/3/2015		26,000	--	--	10,000	6,500	--	ND (10)	2,300	ND (10)	620	430	--	8,100	6.8
MW-32-020	12/6/2016		27,000	--	--	9,800	8,200	--	3.2	2,800	3.2	350	330	--	10,000	5.9
MW-32-035	3/9/2005		3,560	-8.2	-68	1,770	465	--	0.845	260	0.845	312	85.5	13	944	1.07
MW-32-035	6/17/2005		7,550	-9.5	-72	3,520	787	--	ND (2.5)	223	ND (2.5)	506	120	14.8	2,110	1.18
MW-32-035	10/4/2005		8,340	-8.3	-70	3,840	765	--	ND (5)	208	ND (5)	567	134	29.3	1,530	1.26
MW-32-035	12/16/2005		7,660	-8.8	-63	3,510	710	--	1.02	219	1.02	606	128	30	1,580	1.25
MW-32-035	3/10/2006		9,230	-8.6	-74	4,210	1,010	--	ND (0.5)	234	ND (0.5)	654	129	19.2	2,360	1.13
MW-32-035	5/4/2006		9,840	-9.1	-67.8	4,960	1,130	--	ND (0.5)	218	ND (0.5)	693	148	19.5	2,800	1.38
MW-32-035	10/2/2006		11,200	-9.4	-71.4	5,430	1,050	--	ND (2.5)	290	ND (2.5)	839	165	23.9	3,260	1.48
MW-32-035	12/11/2006		10,400	-9	-70.4	5,090	1,000	--	1.9	338	1.9	845	173	22.5	2,620	1.43
MW-32-035	3/6/2007		12,600	-10.2	-75.4	6,070	1,200	--	2.65	360	2.65	1,080	209	23.5	2,910	1.35
MW-32-035	4/30/2007		12,100	-9.9	-78.7	6,610	1,280	--	2.6	475	2.6	1,250	273	26.2	3,280	1.35
MW-32-035	10/1/2007		13,700	-8.9	-72.7	6,830	1,120	--	2.62	490	2.62	1,000	390	29	4,000	1.7
MW-32-035	10/3/2008		15,000	-9.8	-73.1	7,600	1,300	--	3.1	550	3.1	829	150	52.3	3,490	1.49
MW-32-035	9/22/2009		13,000	-9.32	-75.2	6,900	1,400	--	2.8	530	2.8	880	400	53	3,100	1.7
MW-32-035	12/9/2010		11,000	-10.2	-84.2	5,500	1,600	--	ND (2.5)	590	ND (2.5)	750	390 J	51 J	3,000	1.7 J
MW-32-035	12/9/2011		8,500	-10.8	-84.2	5,000	1,700	--	ND (2.5)	640	ND (2.5)	680	310	34	3,100	1.7

Table F-1

Chemical Performance Monitoring Analytical Results, March 2005 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California

Location ID	Sample Date	Total Dissolved Solids (mg/L)	Oxygen-18 (0/00)	Deuterium (00/00)	Chloride (mg/L)	Sulfate (mg/L)	Nitrate (mg/L)	Bromide (mg/L)	Alkalinity (total) (mg/L)	Total Dissolved Solids (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Boron (mg/L)
MW-32-035	12/5/2012	10,000	-11	-89	4,300	1,700	0.0274	ND (5)	630	ND (5)	460	240	31	2,700	1.3
MW-32-035	11/6/2013	8,300	-10.97	-87.16	3,500	1,600	0.0482	ND (2.5)	580	ND (2.5)	450	210	23	2,500	1.2
MW-32-035	11/11/2014	5,800	-10.39	-87.84	3,100	1,500	--	ND (0.5)	550	ND (0.5)	450	170	18	2,000	1.1
MW-32-035	12/1/2014	--	--	--	--	--	0.093	--	--	--	--	--	--	--	--
MW-32-035	4/20/2015	--	--	--	--	--	2.3	--	--	--	--	--	--	--	--
MW-32-035	12/3/2015	7,400	-11.18	-87.49	2,800	1,200	0.058	ND (2.5)	610	ND (2.5)	450	220	18	1,900	1.2
MW-32-035	4/25/2016	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-32-035	12/6/2016	6,700	-10.7781	-87.0352	2,800	1,100	ND (0.05	ND (2.5)	630	ND (2.5)	370	210	20	1,800	0.99
MW-34-055	3/10/2005	6,230	-10.8	-82	2,620	739	--	0.654	240	0.654	366	71.3	29.1	1,900	1.19
MW-34-055	7/15/2005	--	-10.3	-84	2,250	607	--	ND (0.5)	242	ND (0.5)	247	52	16.5	1,420	1.02
MW-34-055	10/5/2005	5,150	-10.6	-88	2,170	619	--	ND (0.5)	232	ND (0.5)	272	59.1	25.8	1,230	1.2
MW-34-055	12/14/2005	5,100	-10.8	-74	2,150	552	--	0.588	236	0.588	217	45	27.2	965	0.937
MW-34-055	3/8/2006	4,850	-10.8	-86.8	2,080	593	--	ND (0.5)	272	ND (0.5)	256	54.2	13.5	1,640	0.956
MW-34-055	5/3/2006	4,320	-11.5	-84.3	2,070	500	--	ND (0.5)	302	ND (0.5)	198	44.8	11.1	1,360	0.846
MW-34-055	10/4/2006	1,680 J	-12.2	-94.8	443	230	--	ND (0.5)	368	ND (0.5)	37.6	8.08	4.59	536	0.54
MW-34-055	10/3/2007	730	-11.3	-96.6	109	266	--	ND (1)	190	ND (1)	15	3.3	3.3	290	0.26
MW-34-055	10/7/2008	700	-13	-100	100	250	--	--	170	--	72.4	16.9	5.26	192	0.248
MW-34-055	9/30/2009	700	-12.26	-100.79	--	--	--	--	160	--	77	17	4.4	120	0.15
MW-34-055	11/17/2009	--	--	--	93	240	--	ND (0.5)	--	ND (0.5)	--	--	--	--	--
MW-34-055	12/7/2010	590	-12.1	-98.8	87	230	--	ND (0.5)	140	ND (0.5)	81	19	5.1	100	0.1
MW-34-055	12/6/2011	630	-12.3	-100.5	83	220	--	ND (0.5)	160	ND (0.5)	81	19	4.6	100	0.19
MW-34-055	12/12/2012	630	-12.7	-105	78	210	ND (0.01	ND (0.5)	140	ND (0.5)	75	20	3.7	100	0.15
MW-34-055	11/20/2013	600	-13.09	-103.32	72	210	ND (0.01	ND (0.5)	150	ND (0.5)	69	19	4.3	88	0.13
MW-34-055	11/6/2014	640	-12.43	-101.86	76	200	ND (0.05	ND (0.5)	140	ND (0.5)	72	20	4	85	ND (0.1)
MW-34-055	12/3/2015	630	-13.02	-102.02	83	230	ND (0.05	ND (0.5)	150	ND (0.5)	80	25	4.7	86	0.19
MW-34-055	12/6/2016	680	-12.4446	-101.069	89	230	ND (0.05	ND (0.5)	150	ND (0.5)	77 J	26	5.6	100	0.11 U
MW-34-080	3/8/2005	6,940	-10.4	-83	4,180	1,040	--	1.01	304	1.01	439	68.1	28	2,750	1.65
MW-34-080	3/15/2005	8,980	--	--	3,920	ND (5)	--	--	288	--	445	65.7	29.7	2,990	--
MW-34-080	6/30/2005	7,840	-8.4	-82	3,910	979	--	ND (0.5)	302	ND (0.5)	497	76.5	27.7	2,670	1.66
MW-34-080	10/5/2005	10,200	-10.1	-85	3,880	1,060	--	ND (0.5)	302	ND (0.5)	429	72.5	47.4	1,660	1.57
MW-34-080	12/14/2005	8,800	-10.2	-71	3,700	880	--	0.854	297	0.854	432	68.3	54.9	1,710	1.54
MW-34-080	3/9/2006	7,830	-9.9	-86.8	3,520	986	--	ND (0.5)	313	ND (0.5)	383	65.8	24	2,420	1.49
MW-34-080	5/3/2006	7,950	-11.7	-77.6	3,700	921	--	ND (0.5)	297	ND (0.5)	425	70.3	23.9	2,480	1.38
MW-34-080	10/4/2006	7,080	-11.3	-81.8	3,210	786	--	0.737	268	0.737	341	65.4	21.1	2,170	1.31
MW-34-080	12/12/2006	6,510	-10.5	-80.9	3,190	789	--	0.742	288	0.742	298	62.9	18.9	2,040	1.26
MW-34-080	3/5/2007	6,360 J	-11.5	-85.8	3,300	783	--	0.72	205	0.72	315	68.3	19.4	2,020	1.29
MW-34-080	4/30/2007	6,390	-11.5	-88.9	3,320 J	889 J	--	ND (1)	245	ND (1)	282	57	18.6	2,080	1.33
MW-34-080	10/3/2007	5,490	-11.3	-87.8	2,630	696	--	ND (1)	240	ND (1)	220	53	21	2,000	1.2
MW-34-080	12/13/2007	5,420	-10.9	-88.6	2,380	698	--	ND (1)	264	ND (1)	193	49.1	25.4	1,450	1.09
MW-34-080	3/12/2008	5,500	-11.4	-87.3	2,510	739	--	ND (1)	238	ND (1)	237	52.6	19.2	2,030	1.14
MW-34-080	5/6/2008	5,820	-11.4	-87.3	2,460	753	--	0.525	216	0.525	230	49	30	1,600	1.2
MW-34-080	10/7/2008	5,300	-11.8	-87.6	2,400	720	--	ND (2)	250	ND (2)	223	46.3	22	1,220	0.765
MW-34-080	12/10/2008	5,300	-10.97	-93.1	2,190	698	--	ND (1)	253	ND (1)	147	45.2	20.6	3,880	1.11
MW-34-080	3/10/2009	5,100	-10.85	-84.77	2,300	700 J	--	ND (2.5)	240	ND (2.5)	219	46.3	22.2	1,480	1.08
MW-34-080	4/30/2009	5,830	-11.45	-85.79	2,340	768	--	ND (1)	237	ND (1)	219	50	24.6	1,510	1.11
MW-34-080	9/30/2009	4,000	-10.79	-88.93	2,300	710	--	ND (1)	230	ND (1)	240	46	22	1,500	0.98
MW-34-080	12/9/2009	4,580	-11.88	-89.1	2,200	690	--	ND (1)	230	ND (1)	--	--	--	--	--
MW-34-080	3/10/2010	4,900	-12.13	-91.56	2,100	660	--	ND (1)	240	ND (1)	220 J	41	28	1,400 J	0.93
MW-34-080	12/7/2010	4,600	-11.1	-87.3	2,300	700	--	ND (1)	220	ND (1)	240	47	24	1,300	1

Table F-1

Chemical Performance Monitoring Analytical Results, March 2005 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California

Location ID	Sample Date		Total Dissolved Solids (mg/L)	Oxygen-18 (0/00)	Deuterium (00/00)	Chloride (mg/L)	Sulfate (mg/L)	Nitrate (mg/L)	Bromide (mg/L)	Alkalinity (total) (mg/L)	Total Dissolved Solids (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Boron (mg/L)
MW-34-080	12/6/2011		3,900	-11.1	-88.1	1,900	640	--	ND (1)	230	ND (1)	220	43	16	1,300	1.1
MW-34-080	12/12/2012	FD	--	-11.1	-89.3	1,800	630	ND (0.01	--	250	--	210	48	--	1,300	--
MW-34-080	12/12/2012		4,300	-11.2	-90.2	1,800	630	ND (0.01	ND (1)	250	ND (1)	220	51	17	1,300	1
MW-34-080	11/20/2013	FD	4,600	-11.18	-88.36	1,900	620	ND (0.01	ND (1)	260	ND (1)	210	56	14	1,200	1
MW-34-080	11/20/2013		4,500	-11.43	-87.99	1,900	620	ND (0.01	ND (1)	260	ND (1)	210	52	14	1,300	0.96
MW-34-080	11/6/2014		--	-11.6	-90.9	--	--	--	--	280 J	--	240	50	12	1,200	0.84
MW-34-080	12/1/2014		--	--	--	--	--	ND (0.05	--	--	--	--	--	--	--	--
MW-34-080	4/20/2015		--	--	--	--	--	ND (0.05	--	--	--	--	--	--	--	--
MW-34-080	12/3/2015		3,600	-11.53	-92.07	1,500	510	ND (0.05	ND (2.5)	300	ND (2.5)	220	48	--	1,000	0.83
MW-34-080	4/26/2016		--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-34-080	12/6/2016	FD	4,200	-10.9343	-88.0238	1,900	620	--	ND (2.5)	290	ND (2.5)	230 J	47	16	1,300	0.98
MW-34-080	12/6/2016		4,300	-11.3322	-88.5807	2,000	630	--	ND (2.5)	270	ND (2.5)	220 J	47	15	1,300	0.98
MW-34-100	3/14/2005		10,800	--	--	5,010	1,210	--	--	175	--	221	17.4	34.1	3,600	--
MW-34-100	6/21/2005	FD	10,900 J	-9.5	-77	4,920	1,180	--	ND (0.5)	179	ND (0.5)	243	18.2	32.1	3,740	2.36
MW-34-100	6/21/2005		11,300	-9.7	-75	5,350	1,270	--	ND (0.5)	179	ND (0.5)	229	17.4	27.1	3,510	2.22
MW-34-100	10/5/2005	FD	10,400	-9.9	-83	4,680	1,200	--	ND (0.5)	172	ND (0.5)	228	14.1	50.9	2,730	2.57
MW-34-100	10/5/2005		10,400	-9.9	-83	4,530	1,150	--	ND (0.5)	172	ND (0.5)	171	13.8	55.2	2,450	2.57
MW-34-100	12/14/2005	FD	--	--	--	--	--	--	--	--	--	220	15.1	64.2	2,530	2.4
MW-34-100	12/14/2005		--	--	--	--	--	--	--	--	--	226	14.9	62.9	2,530	2.32
MW-34-100	3/8/2006	FD	10,100	-10.1	-101.9J	4,920	1,220	--	--	159	--	182	11.9	36.5	3,530	2.46
MW-34-100	3/8/2006		10,000	-11.4	-75.5J	4,720	1,180	--	--	152	--	179	12.1	32.5	3,580	2.41
MW-34-100	5/3/2006	FD	9,990	-10.6	-71.9	5,170	1,230	--	--	136	--	166	12.2	31.3	3,900	2.77
MW-34-100	5/3/2006		9,940	-10.5	-74.5	5,060	1,200	--	--	133	--	162	12	31.1	3,890	2.73
MW-34-100	4/30/2007	FD	11,900	-11.2	-82.1	5,880	1,050	--	--	123	--	189	12	32.1	3,920	2.4
MW-34-100	4/30/2007		10,600	-10.9	-80.7	5,920	1,040	--	--	123	--	186	12	31.5	3,840	2.39
MW-34-100	10/3/2007	FD	10,500	-10.6	-78.4	5,360	953	--	ND (1)	120	ND (1)	160	10	43	4,300	2.4
MW-34-100	10/3/2007		10,700	-10.2	-78.2	5,350	970	--	ND (1)	120	ND (1)	170	11	44	4,300	2.5
MW-34-100	10/7/2008	FD	11,000	-11	-81.3	5,600	1,200	--	ND (2.5)	140	ND (2.5)	184	11.5	56.7	3,880 J	2.59
MW-34-100	10/7/2008		11,000	-10.9	-80.8	5,400	1,200	--	ND (2.5)	140	ND (2.5)	158	10.6	54.5	2,970 J	2.35
MW-34-100	9/30/2009	FD	--	--	--	5,600	1,300	--	--	170	--	--	--	--	--	--
MW-34-100	9/30/2009		--	--	--	5,500	1,300	--	--	170	--	200	11	73	3,800	2.3
MW-34-100	11/17/2009		11,000	-10.47	-82.38	--	--	--	ND (1)	--	ND (1)	--	--	--	--	--
MW-34-100	12/8/2010	FD	9,900	-10	-80.4	5,700	1,200	--	ND (1)	89 J	ND (1)	180	9.8	60 J	4,000	2.5
MW-34-100	12/8/2010		10,000	-9.8	-79.5	5,800	1,300	--	ND (2.5)	140 J	ND (2.5)	190	9.6	52 J	4,100	2.6
MW-34-100	12/6/2011	FD	9,400	-10	-79.5	5,600	1,200	--	ND (2.5)	120	ND (2.5)	160	7.4	43 J	3,900	2.7
MW-34-100	12/6/2011		10,000	-10.1	-79.2	5,700	1,300	--	ND (2.5)	120	ND (2.5)	170	7.6	43	4,000	2.7
MW-34-100	11/26/2012	FD	11,000	-10.2	-80.9	5,900	1,200	0.421	ND (2.5)	130	ND (2.5)	150	8.2	47	3,200	2.6
MW-34-100	11/26/2012		11,000	-10.1	-80.5	5,900	1,200	0.444	ND (2.5)	120	ND (2.5)	150	8.6	47	3,100	2.6
MW-34-100	4/16/2013	FD	--	--	--	--	--	ND (0.5)	--	--	--	--	--	--	--	--
MW-34-100	4/16/2013		--	--	--	--	--	ND (0.5)	--	--	--	--	--	--	--	--
MW-34-100	11/20/2013	FD	10,000	-9.81	-79.33	5,300	1,100	0.419	ND (2.5)	120	ND (2.5)	150	8.5	35	3,900	2.7
MW-34-100	11/20/2013		10,000	-10.18	-78.9	5,300	1,200	0.422	ND (2.5)	120	ND (2.5)	140	8	35	3,900	2.6
MW-34-100	10/2/2014		--	--	--	--	--	0.64	--	--	--	--	--	--	--	--
MW-34-100	12/1/2014	FD	9,900	-10.1	-77.2	5,500	1,100	0.61 J	ND (1)	100	ND (1)	140	5.6	32	4,000	2
MW-34-100	12/1/2014		9,900	-9.97	-76.95	5,400	1,100	0.58 J	ND (1)	95	ND (1)	140	5.6	30	3,900	2.2
MW-34-100	2/16/2015		--	--	--	--	--	0.61	--	--	--	--	--	--	--	--
MW-34-100	4/20/2015	FD	--	--	--	--	--	ND (0.056	--	--	--	--	--	--	--	--
MW-34-100	4/20/2015		--	--	--	--	--	ND (0.05	--	--	--	--	--	--	--	--
MW-34-100	10/6/2015		--	--	--	--	--	0.29	--	--	--	--	--	--	--	--

Table F-1

Chemical Performance Monitoring Analytical Results, March 2005 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

Location ID	Sample Date	Total Dissolved Solids (mg/L)	Oxygen-18 (0/00)	Deuterium (00/00)	Chloride (mg/L)	Sulfate (mg/L)	Nitrate (mg/L)	Bromide (mg/L)	Alkalinity (total) (mg/L)	Total Dissolved Solids (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Boron (mg/L)
MW-34-100	12/3/2015 FD	9,600	-10.16	-78.93	5,200	1,000	0.73	ND (5)	94	ND (5)	160	7.1	31	3,800	2.8
MW-34-100	12/3/2015	9,900	-10.1	-79.04	5,100	980	0.74	ND (5)	100	ND (5)	150	6.7	30	3,700	2.7
MW-34-100	2/25/2016	--	--	--	--	--	0.13	--	--	--	--	--	--	--	--
MW-34-100	4/26/2016	--	--	--	--	--	ND (0.05	--	--	--	--	--	--	--	--
MW-34-100	10/6/2016	--	--	--	--	--	ND (0.05	--	--	--	--	--	--	--	--
MW-34-100	12/6/2016	8,900	-10.6026	-81.5735	4,700	1,200	0.078	0.59	130	0.59	140 J	7.6	33	3,600	2.3
MW-34-100	12/6/2016 *	--	-11.2176	-86.8470	--	--	--	--	--	--	--	--	--	--	--
R-27	3/7/2005	669	-12.3	-102	92.7	244	--	ND (0.5)	136	ND (0.5)	82.8	31.3	4.72	108	ND (0.2)
R-27	6/14/2005	686	-11.4	-92	90.9	266	--	ND (0.5)	127	ND (0.5)	81.9	29.8	6.04	98.9	ND (0.2)
R-27	10/5/2005	678	-11.6	-94	85.1	255	--	ND (0.5)	130	ND (0.5)	101	36.2	6.56	91.2	ND (0.2)
R-27	12/16/2005	718	-11.7	-87	87.9	253	--	ND (0.5)	126	ND (0.5)	85.5	29.5	5.99	75.6	ND (0.2)
R-27	3/6/2006	656	-11.8	-92.1	90.6	268	--	ND (0.5)	144	ND (0.5)	83.5	29.4	5.44 J	101	ND (0.2)
R-27	5/3/2006	567	-12.8	-93.9	93.1	267	--	ND (0.5)	139	ND (0.5)	87	31.1	3.12 J	106	ND (0.2)
R-27	10/4/2006	752 J	-12.2	-94.9	91.5	261	--	ND (0.5)	128	ND (0.5)	82.9	31.5	6.24 J	98.1	ND (0.2)
R-27	12/20/2006	680	-12.7	-98.1	94.5	266	--	ND (0.5)	138	ND (0.5)	83.2	30.9	3.64	106	ND (0.2)
R-27	3/13/2007	750 J	-13	-99.5	96.5	267	--	ND (0.5)	130	ND (0.5)	86.9	31.3	4.73	106	ND (0.2)
R-27	5/8/2007	715 J	-12.9	-103.6	92.6	269	--	ND (0.5)	143	ND (0.5)	84.3	29.8	5.55	100	ND (0.2)
R-27	9/11/2007	650	-12.5	-100.5	89.4	253	--	ND (0.2)	132	ND (0.2)	74.2	28.9	5.47	86.5	ND (0.2)
R-27	12/5/2007	--	-11.7	-99	94.7	256	--	ND (0.2)	137	ND (0.2)	89.8	31.7	6.6	93.4	0.157
R-27	4/2/2008	--	--	--	93	267	--	ND (1)	136	ND (1)	80.2	30.7	5.5	106	0.432
R-27	6/17/2008	682	-13	-101.4	91.6	254	--	ND (1)	134	ND (1)	76.2	31.8	6.69	89.7	ND (0.2)
R-28	3/8/2005	651	-12.5	-102	90.4	231	--	ND (0.5)	132	ND (0.5)	83.7	31.4	5.02	107	ND (0.2)
R-28	6/14/2005	680	-11.6	-95	91.2	268	--	ND (0.5)	127	ND (0.5)	78.5	28.5	5.08	94.5	ND (0.2)
R-28	10/5/2005	672	-11.6	-94	85.5	255	--	ND (0.5)	122	ND (0.5)	85.7	30.4	6.3	77	ND (0.2)
R-28	12/16/2005	710	-11.5	-83	88.1	254	--	ND (0.5)	126	ND (0.5)	87.2	29.8	6.11	76.8	ND (0.2)
R-28	3/6/2006	675	-12.3	-93.4	91	270	--	ND (0.5)	146	ND (0.5)	76.6	26.6	5.22 J	91.5	ND (0.2)
R-28	5/3/2006	586	-13	-92.1	93.4	270	--	ND (0.5)	136	ND (0.5)	88.1	31.4	4.04 J	107	ND (0.2)
R-28	10/4/2006	644 J	-12.6	-95.3	90.9	259	--	ND (0.5)	133	ND (0.5)	84.2	32.1	6.17 J	96.5	ND (0.2)
R-28	12/20/2006	615	-12.4	-99.6	93.3	262	--	ND (0.5)	143	ND (0.5)	85.7	32	4.66	108	ND (0.2)
R-28	3/14/2007	710	-12.8	-100.4	96.7	268	--	ND (0.5)	133	ND (0.5)	87.9	31	5.71	105	ND (0.2)
R-28	5/9/2007	690	-13	-102.3	95.8	271	--	ND (0.5)	143	ND (0.5)	86.1	30.5	5.92	103	ND (0.2)
R-28	9/12/2007	682	-12.4	-99.4	106	296	--	ND (0.2)	122	ND (0.2)	73.8	29.9	6.36	89.2	ND (0.2)
R-28	12/6/2007	--	-11.7	-98.6	96.5	258	--	ND (0.2)	139	ND (0.2)	75.7	30.4	6.62	79.4	ND (0.2)
R-28	4/2/2008	--	--	--	92.5	309	--	ND (1)	137	ND (1)	84.7	31.4	5.58	108	0.467
R-28	6/18/2008	672	-13.2	-101.7	89.4	248	--	ND (1)	132	ND (1)	43.3	31.1	6.95	93.9	ND (0.2)
R-28	9/17/2008	640	--	--	91.4	256	--	ND (0.5)	132	ND (0.5)	83.4	31.2	6.48	78	ND (0.2)
R-28	12/4/2008	649	-11.89	-97	97.4	260	--	ND (1)	135	ND (1)	81.7	30	5.95	114	0.262
R-28	1/21/2009	652	-11.97	-96.7	91.5	253	--	ND (0.5)	134	ND (0.5)	79.2	27.8	6.01	91.7	ND (0.2)
R-28	4/9/2009	643	-12.43	-97.81	92.7	250	--	ND (0.5)	138	ND (0.5)	79.6	28.8	5.44	97	ND (0.2)
R-28	7/8/2009	632	-12.78	-98.62	84.5	239	--	ND (0.5)	131	ND (0.5)	79.6	27.3	6.17	86.9	ND (0.2)
R-28	9/9/2009	640	-12.47	-99.06	86	236	--	ND (1)	131	ND (1)	74.8	26.2	6.01	78.7	ND (0.2)
R-28	12/14/2009	612	-13.03	-98.33	89.7	244	--	ND (1)	131	ND (1)	73.5	26.7	4.98	88.2	ND (0.2)
R-28	12/21/2010	602	-12.1	-101.8	91	223	--	ND (0.5)	133	ND (0.5)	69.1	24.8	4.75	87.8	ND (0.2)
R-28	6/8/2011	--	--	--	--	--	--	--	116	--	--	--	--	--	--
R-28	8/23/2011	--	--	--	--	--	--	--	115	--	--	--	--	--	--
R-28	11/30/2011	--	--	--	--	--	--	--	119	--	--	--	--	--	--
R-28	1/11/2012	--	--	--	80.5	218	--	ND (0.5)	127	ND (0.5)	70.2	27.4	4.76	83.7	ND (0.2)
R-28	2/29/2012	--	--	--	--	--	--	--	123	--	--	--	--	--	--
R-28	5/22/2012	--	--	--	--	--	--	--	124	--	--	--	--	--	--

Table F-1

Chemical Performance Monitoring Analytical Results, March 2005 through December 2016

Fourth Quarter 2016 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report,
PG&E Topock Compressor Station, Needles, California

Location ID	Sample Date		Total Dissolved Solids (mg/L)	Oxygen-18 (0/00)	Deuterium (00/00)	Chloride (mg/L)	Sulfate (mg/L)	Nitrate (mg/L)	Bromide (mg/L)	Alkalinity (total) (mg/L)	Total Dissolved Solids (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Boron (mg/L)
R-28	8/22/2012		--	--	--	--	--	--	--	126	--	--	--	--	--	--
R-28	11/1/2012		499	-12.6	-102.2	75.4	212	--	ND (0.5)	132	ND (0.5)	71.3	27.5	4.12	79.3	ND (0.2)
R-28	1/9/2013		--	--	--	--	--	--	--	130	--	--	--	--	--	--
R-28	3/5/2013		--	--	--	--	--	--	--	122	--	--	--	--	--	--
R-28	5/21/2013		--	--	--	--	--	ND (0.5)	--	127	--	--	--	--	--	--
R-28	7/16/2013		--	--	--	--	--	ND (0.5)	--	124	--	--	--	--	--	--
R-28	11/21/2013		564	-12.79	-103.05	80.4	220	0.293	ND (0.5)	131	ND (0.5)	73.2	26.2	4.44	84.7	0.121
R-28	1/14/2014		--	--	--	--	--	0.315	--	--	--	--	--	--	--	--
R-28	3/13/2014		--	--	--	--	--	0.41	--	--	--	--	--	--	--	--
R-28	5/22/2014		--	--	--	--	--	0.27	--	--	--	--	--	--	--	--
R-28	7/16/2014		--	--	--	--	--	0.37	--	--	--	--	--	--	--	--
R-28	11/20/2014		620	-12.26	-99.96	85	230	0.29	ND (0.5)	130	ND (0.5)	68	23	4.5	88	0.13
R-28	1/15/2015		--	--	--	--	--	0.33	--	--	--	--	--	--	--	--
R-28	2/25/2015		--	--	--	--	--	0.44	--	--	--	--	--	--	--	--
R-28	6/9/2015		--	--	--	--	--	0.37	--	--	--	--	--	--	--	--
R-28	9/16/2015		--	--	--	--	--	0.34	--	--	--	--	--	--	--	--
R-28	12/9/2015		640	-11.8759	-97.4889	94	250	0.38	ND (1)	120	ND (1)	61	20	4.7 J	100	0.13
R-28	1/26/2016	FD	--	--	--	--	--	0.46	--	--	--	--	--	--	--	--
R-28	1/26/2016		--	--	--	--	--	0.47	--	--	--	--	--	--	--	--
R-28	2/24/2016		--	--	--	--	--	0.52	--	--	--	--	--	--	--	--
R-28	4/27/2016		--	--	--	--	--	0.42	--	--	--	--	--	--	--	--
R-28	7/7/2016		--	--	--	--	--	0.44	--	--	--	--	--	--	--	--
R-28	11/29/2016	FD	--	-12.15	-101.1	96	240	0.42	ND (1)	130	ND (1)	64 J	22	4.5	91	0.21
R-28	11/29/2016		--	-12.71	-101.7	92	240	0.31	ND (1)	130	ND (1)	67 J	22	4.5	91	0.21 U

Notes:

--- = data were not collected, were not available, were rejected or there was a field instrument malfunction.
* = Result of second analytical run from primary sample
0/00 = differences from global standards in parts per thousand.
FD = field duplicate sample.
J = concentration or reporting limit estimated by laboratory or data validation.
mg/L = milligrams per liter
ND = not detected at the listed reporting limit.

Alkalinity (total) reported as calcium carbonate.

Nitrate as nitrogen was not requested. Nitrate/nitrite as nitrogen is shown.

APPENDIX G

Interim Measures Extraction System Operations Log, Fourth Quarter 2016

APPENDIX G

Interim Measures Extraction System Operations Log, Fourth Quarter 2016, PG&E Topock Performance Monitoring Program

During Fourth Quarter 2016 (November and December), extraction wells TW-3D and PE-1 operated at a target pump rate of at 135 gallons per minute, excluding periods of planned and unplanned downtime. Extraction wells TW-2S and TW-2D were operated for a brief time on December 13, 2016 for sample collection during the fourth quarter groundwater monitoring program sampling event. The operational run time for the Interim Measure groundwater extraction system (combined or individual pumping) was approximately 99.3 percent during Fourth Quarter 2016. The operational run time for the Interim Measure groundwater extraction system (combined or individual pumping) was approximately 94.6 percent during the 2016 annual reporting period.

The Interim Measure Number 3 (IM-3) facility treated approximately 11,848,020 gallons of extracted groundwater during Fourth Quarter 2016. The IM-3 facility also treated approximately 1,570 gallons of water generated from the groundwater monitoring program and 27,900 gallons of water from IM-3 well backwashing. Four containers of solids from the IM-3 facility were transported offsite during the reporting period.

Periods of planned and unplanned extraction system downtime (that together resulted in approximately 0.7 percent of downtime during Fourth Quarter 2016) are summarized below. The times shown are in Pacific Standard Time to be consistent with other data collected (for example, water level data) at the site.

G.1 November 2016

- **November 2, 2016 (planned):** The extraction well system was offline from 8:14 a.m. to 8:46 a.m. for testing of critical alarms and the leak detection system. Extraction system downtime was 32 minutes.
- **November 7, 2016 (unplanned):** The extraction well system was offline from 7:48 p.m. to 8:16 p.m. to change pre filters on primary reverse osmosis system. Extraction system downtime was 28 minutes.
- **November 10, 2016 (unplanned):** The extraction well system was offline from 10:46 a.m. to 12:12 p.m. to replace the microfilter modules. Extraction system downtime was 1 hour 26 minutes.
- **November 17, 2016 (unplanned):** The extraction well system was offline from 10:25 a.m. to 10:35 a.m. due to a human-machine interface (HMI) server restart. Extraction system downtime was 10 minutes.
- **November 23, 2016 (unplanned):** The extraction well system was offline from 5:56 p.m. to 7:28 p.m. for tank level management. Extraction system downtime was 1 hour, 32 minutes.
- **November 28, 2016 (planned):** The extraction well system data were not recorded from 9:08 a.m. to 9:20 a.m., from 11:02 a.m. to 11:14 a.m., and from 11:42 a.m. to 11:56 a.m. due to maintenance on the HMI and supervisory control and data acquisition (SCADA) systems. All records indicate that the extraction wells were running during this time. Extraction well system information was unavailable for 38 minutes.
- **November 30, 2016 (unplanned):** The extraction well system was offline from 11:14 a.m. to 11:38 a.m. to gather extraction well specific capacity and water level measurements for hydrogeologic evaluation. Extraction system downtime was 24 minutes.

G.2 December 2016

- **December 7, 2016 (planned):** The extraction well system was offline from 9:16 a.m. to 9:44 a.m. and again from 9:46 a.m. to 9:48 a.m. due to test critical alarms. Extraction system downtime was 30 minutes.
- **December 9, 2016 (unplanned):** The extraction well system was offline from 4:56 a.m. to 5:22 a.m. to change the pre-filter on the reverse osmosis unit. Extraction system downtime was 26 minutes.
- **December 13, 2016 (planned):** The extraction well system was offline from 10:56 a.m. to 11:04 a.m. and again from 11:08 a.m. to 11:20 a.m. to facilitate quarterly sampling. Extraction system downtime was 20 minutes.
- **December 14, 2016 (unplanned):** The extraction well system was offline from 10:14 a.m. to 1:02 p.m. to replace the microfilter modules and repair the primary reverse osmosis unit. Extraction system downtime was 2 hours, 48 minutes.
- **December 23, 2016 (unplanned):** The extraction well system was offline from 11:48 a.m. to 11:54 p.m. due to a power outage, changed plant over to generator power. Extraction system downtime was 6 minutes.
- **December 30, 2016 (unplanned):** The extraction well system was offline from 9:04 a.m. to 9:30 a.m. due to a blockage requiring maintenance in the 301 Tanks. Extraction system downtime was 34 minutes.
- **December 31, 2016 (unplanned):** The extraction well system was offline from 1:24 p.m. to 2:26 p.m. for managing water levels in the Raw Water Storage tank (T-100). Extraction system downtime was 1 hour, 2 minutes.

Arcadis U.S., Inc.

101 Creekside Ridge Court

Suite 200

Roseville, California 95678

Tel 916 786 0320

Fax 916 786 0366

www.arcadis.com