ARCADIS Design & Consultancy for natural and built assets

Pacific Gas and Electric Company

FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT

Topock Compressor Station,

Needles, California

March 15, 2020

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

Frederick T. Stanin, P.G., C. Hg
Principal Hydrogeologist

Alison Schaffer
Arcadis Report Lead

Daniel Bush, P.E.
Arcadis Project Manager

FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT

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.:

30019133

Date:

March 15, 2020

CONTENTS

TABLES

FIGURES

APPENDICES

ACRONYMS AND ABBREVIATIONS

δ2H	deuterium
δ18O	oxygen-18
µg/L	microgram per liter
3V	three-volume
COPC	constituent of potential concern
Cr(VI)	hexavalent chromium
DTSC	California Environmental Protection Agency, Department of Toxic Substances Control
ft/ft	foot or feet per foot
ft bgs	feet below ground surface
GMP	Groundwater Monitoring Program
gpm	gallons per minute
IM	interim measure
IM-3	Interim Measures number 3
IMCP	Interim Measures Contingency Plan
LF	low-flow
MCL	maximum contaminant level
MS/MSD	matrix spike/matrix spike duplicate
ORP	oxidation-reduction potential
PDS	post-digestion spike
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
RPD	relative percent difference
RRB	Red Rock Bridge
TDS	total dissolved solids
TSS	total suspended 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 Groundwater Monitoring Program (GMP), Surface Water Monitoring Program (RMP), and IM Performance Monitoring Program (PMP) for the Topock Compressor Station (the site). Chemical and hydraulic monitoring data were collected and used to determine if site conditions have changed and evaluate the IM hydraulic containment system performance based on a set of standards approved by the California Department of Toxic Substances Control (DTSC).

Key items included in this report are: (1) GMP and RMP activities and results; (2) hexavalent chromium data for monitoring wells in the floodplain area; (3) measured groundwater elevations and hydraulic gradient data at compliance well pairs; and (4) pumping rates and volumes from the IM extraction system.

During Fourth Quarter 2019, IM extraction well TW-03D was operated to support hydraulic control. Hydraulic gradient data indicate that the minimum landward gradient target of 0.001 foot per foot was exceeded each month, providing evidence of hydraulic containment of the hexavalent chromium plume. Hexavalent chromium concentrations greater than 20 micrograms per liter in the floodplain area were contained for removal and treatment. Based on the data and evaluation presented in this report, the IM performance standard has been met for the Fourth Quarter 2019.

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 (currently Interim Measure Number 3 [IM-3]) Performance Monitoring Program (PMP).

This report presents the monitoring data collected from PG&E's GMP, RMP, and PMP programs between November 1 and December 31, 2019 (hereafter referred to as "Fourth Quarter 2019"). In addition, this report serves as an annual report and provides a summary of monitoring data collected from the GMP, RMP, and PMP programs between January 1 and December 31, 2019 (hereafter referred to as the "Annual Reporting Period"). 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 2019 monitoring activities and site operations conducted in support of these programs.

Section 3 presents GMP and RMP monitoring results for the Fourth Quarter 2019.

Section 4 presents GMP and RMP monitoring results for the Annual Reporting Period.

Section 5 presents PMP monitoring results and the IM evaluation for the Fourth Quarter 2019.

Section 6 presents PMP monitoring results and the IM evaluation for the Annual Reporting Period.

Section 7 describes upcoming monitoring events for the First Quarter 2020.

Section 8 lists the references cited throughout this report.

This combined GMP, RMP, and PMP reporting format was approved by the California Environmental Protection Agency, Department of Toxic Substances Control (DTSC) in May 2009 (DTSC 2009).

1.1 Fourth Quarter 2019 Regulatory Communication

PG&E communications with the DTSC in Fourth Quarter 2019 associated with the GMP, RMP, and/or PMP programs are outlined below. Communications from First, Second, and Third Quarter 2019 are provided in previous reports (Arcadis 2019a, 2019b, 2019c).

- The Third Quarter 2019 Interim Measures Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report (PMP-GMP Report) was submitted to the DTSC on December 15, 2019 (Arcadis 2019c).
- Required GMP, RMP, and PMP notifications submitted for Fourth Quarter 2019 included:
    - On February 3, 2020, Arcadis sent a quarterly email notification to PG&E providing hexavalent chromium (Cr[VI]) and dissolved chromium results from the November 2019 shoreline and in-channel surface water sampling event. During the sampling event, Cr(VI) and dissolved chromium concentrations were lower than the respective reporting limits.
    - On March 9, 2020, Arcadis, on behalf of PG&E, sent a quarterly email notification to the DTSC providing Cr(VI) and dissolved chromium results from four subject floodplain wells (MW-34-100, MW-44-115, MW-46-175, and MW-44-125).
    - As part of the conditional approval for the shutoff of extraction well PE-01, GMP monitoring results for monitoring wells listed in the July 20, 2015 DTSC approval letter (see Section 1.4.2.2; DTSC 2015) 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 the DTSC within 40 days after the end of the quarterly GMP sampling event. In Fourth Quarter 2019, Cr(VI) and/or dissolved chromium concentrations at ten monitoring wells (MW-20-070, MW-26, MW-27-020, MW-31-135, MW-33-210, MW-39-080, MW-39-100, MW-46-205, MW-47-055, and MW-47-115) exceeded the notification levels, and a notification email was submitted to the DTSC on February 16, 2020.

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 2018).

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, naturally occurring Cr(VI) in groundwater was calculated to exhibit an upper tolerance limit (UTL) concentration of 32 micrograms per liter (µg/L; CH2M Hill 2009). 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 most 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

Routine groundwater and surface water monitoring activities at the site began in 1998 following a Resource Conservation and Recovery Act (RCRA) facility investigation and are ongoing (CH2M Hill 2005). The main objective of the GMP and RMP programs is to monitor concentrations of Cr(VI) and other site constituents in groundwater and surface water to determine if site conditions have changed and to make decisions about remedial options and future monitoring (CH2M Hill 2005). In accordance with the 2005 Monitoring Plan for Groundwater and Surface Water Monitoring (CH2M Hill 2005), quarterly monitoring reports document groundwater and surface water monitoring activities performed at the site during each reporting period. Monitoring reports to date are available on the DTSC website. This report documents the GMP and RMP monitoring activities conducted in Fourth Quarter 2019 and during the Annual Reporting Period.

1.3.2 GMP and RMP Monitoring Networks

The GMP monitoring well network and RMP surface water monitoring network are shown on Figures 1-2 and 1-3, respectively, and are summarized in the table below. The complete GMP network includes 145 wells that monitor groundwater in the Alluvial Aquifer and bedrock. Well construction details for wells in the GMP monitoring well network are summarized in Table 1-2. The RMP network consists of 16 surface water monitoring locations, nine of which are sampled at multiple depths.

Groundwater and Surface Water Monitoring Wells

Groundwater Monitoring Wells	Surface Water Monitoring Wells
133 monitoring wells in California, including two normally dry wells	10 river channel locations (9 of which are sampled at two different depths)
8 monitoring wells in Arizona	4 shoreline locations
4 IM-3 extraction wells	2 other surface water sampling locations (adjacent to the shoreline)

GMP and RMP monitoring consists of collecting groundwater and surface water samples, inspecting the monitoring wells, and taking corrective actions as needed. GMP and RMP monitoring is performed quarterly, although the monitoring wells included in each GMP event vary by quarter. In addition, GMP monitoring is performed monthly at two extraction wells (TW-03D and PE-01). Table 1-2 provides a list of the monitoring wells and surface water monitoring locations included in the GMP and RMP programs and the monitoring frequency at each location. Monitoring frequency at GMP wells is also shown on Figure 1-2.

If a storm causes surface water flow in Bat Cave Wash, additional groundwater samples are collected from monitoring wells MW-09, MW-10, and MW-11. Bat Cave Wash is an incised ephemeral stream adjacent to the Topock Compressor Station, which flows following rainfall events and drains into the Colorado River (Figures 1-1 and 1-2).

1.4 Interim Measure Performance Monitoring Program

1.4.1 Basis for PMP Program

Operation of the current IM-3 system began in July 2005. The IM-3 system is intended to maintain hydraulic control of the groundwater Cr(VI) plume until the final corrective action is in place at the site (CH2M Hill 2007). The IM-3 system consists of 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). Figure 1-1 shows the locations of the IM-3 extraction, conveyance, treatment, and injection facilities.

In a letter dated February 14, 2005, the DTSC issued an IM performance directive that established the operational requirements for the IM and methods for evaluating the performance of the IM (DTSC 2005). As defined by the DTSC, the performance standard for the IM is to *"establish and maintain a net landward hydraulic gradient, both horizontally and vertically, that ensures that Cr(VI) concentrations at or greater than 20 micrograms per liter [µg/L] in the floodplain are contained for removal and treatment"* (DTSC 2005). The IM is required to maintain a landward hydraulic gradient of at least 0.001 foot per foot (ft/ft) within the lower portion of the Alluvial Aquifer (DTSC 2005).

In accordance with the February 2005 DTSC directive, the following conditions must be met to demonstrate achievement of the IM performance standard (DTSC 2005):

- Demonstrate that a landward hydraulic gradient is maintained within the lower portion of the Alluvial Aquifer in the floodplain by:
    - Providing potentiometric surface contour maps of the Alluvial Aquifer within the floodplain area
    - Providing calculated hydraulic gradients using established gradient well pairs.
- Demonstrate that Cr(VI) concentrations greater than 20 µg/L in the floodplain area are contained for removal and treatment by:
    - Depicting the 20 and 50 µg/L isoconcentration contours for Cr(VI) within the floodplain on potentiometric surface maps and hydrogeologic cross-sections
    - Providing maps and cross-sections of the Cr(VI) concentration for the upper, middle, and lower portions of the Alluvial Aquifer in the floodplain area
    - Providing time versus concentration graphs for Cr(VI) measured in floodplain wells.

The February 2005 DTSC directive also defined the reporting requirements for the IM (DTSC 2005). In October 2007, the DTSC approved modifications to the reporting requirements, discontinuing monthly performance monitoring reports and continuing with quarterly and annual reports (DTSC 2007). The DTSC approved additional updates and modifications to the PMP in letters dated October 12, 2007; July 14, 2008; July 16, 2008; March 3, 2010; April 28, 2010; and June 27, 2014 (DTSC 2007, 2008a, 2008b, 2010a, 2010b, 2014).

1.4.2 PMP Monitoring Network

The PMP consists of a network of monitoring wells used to demonstrate achievement of the IM performance standard. Subsets of wells within the PMP network, including: (1) chromium monitoring network; (2) IM extraction wells; (3) IM hydraulic monitoring network; (4) IM Contingency Plan (IMCP) monitoring wells; and (5) IM chemical performance monitoring network, focus on different methods for evaluating performance of the IM. The PMP monitoring network is presented in the table below and shown on Figure 1-4.

PMP Monitoring Network (145 monitoring wells included in the GMP)

Type of Well	Wells Included in Network
IM Extraction Wells (4 monitoring wells)	• TW-02D • TW-03D • TW-02S • PE-01
IM Hydraulic Monitoring Network (57 monitoring wells and 2 river monitoring locations)	• 16 shallow monitoring wells • 15 mid-depth monitoring wells • 26 deep monitoring wells • 2 river monitoring locations: I-3 and Red Rock Bridge (RRB)
IMCP Monitoring Wells (24 monitoring wells)	• 6 shallow monitoring wells • 5 mid-depth monitoring wells • 13 deep monitoring wells
IM Chemical Performance Monitoring Network (10 monitoring wells and 1 river monitoring location)	• 5 shallow monitoring wells • 2 mid-depth monitoring wells • 3 deep monitoring wells • 1 river monitoring location: R-28

The subsets of monitoring well networks within the PMP are described in the following subsections.

1.4.2.1 Chromium Monitoring Network

Cr(VI) data, collected as part of the GMP, are used to generate maps, cross-sections, and concentration time series charts that demonstrate that Cr(VI) concentrations greater than 20 µg/L in the floodplain area are contained for removal and treatment. As described in Section 1.3.2, groundwater sampling events are performed quarterly; however, the monitoring wells included in each sampling event vary by quarter. In addition, groundwater sampling is performed monthly at extraction wells TW-03D and PE-01. Table 1-2 provides a list of monitoring wells included in the chromium monitoring network (i.e., the GMP monitoring network) and the monitoring frequency of each location.

1.4.2.2 IM Extraction Wells

The PMP includes four IM extraction wells, which are used to ensure a landward hydraulic gradient via groundwater extraction (Figure 1-4). The operation of the IM extraction system, including pumping rates, planned/unplanned downtime, and volume of groundwater extracted from each extraction well, is documented to demonstrate proper operation of the extraction system. In addition, the wells are sampled

as part of the GMP: extraction wells TW-03D and PE-01 are sampled monthly, TW-02D is sampled quarterly, and TW-02S is sampled annually.

Wells Monitored for Conditional Shutdown of PE-01

On July 20, 2015, the DTSC conditionally approved a 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 and contingency is not triggered based on chromium concentrations in select floodplain wells (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.

As part of the conditional approval for PE-01 shutoff, GMP monitoring results from 47 monitoring wells listed in the July 20, 2015 DTSC approval letter (i.e., wells within approximately 800 feet of TW-03D; Table 1-2) are compared to the maximum detected Cr(VI) and dissolved chromium concentrations from 2014 (or 2013 for wells sampled biennially). If any of the wells exceed the 2014 maximum concentration, then the DTSC must be notified within 40 days after completion of the field sampling event to determine if PE-01 pumping should be reinitiated (DTSC 2015).

1.4.2.3 IM Hydraulic Monitoring Network

The IM hydraulic monitoring network consists of 52 monitoring wells located on the California side of the Colorado River and two river monitoring locations (I-3 and RRB) used to evaluate the performance of the IM-3 system by demonstrating compliance of the required hydraulic gradient of 0.001 ft/ft (Figure 1-4, Table 1-2). In addition, five groundwater monitoring wells located on the Arizona side of the Colorado River (MW-54-085, MW-54-140, MW-54-195, MW-55-045, and MW-55-120; not formally part of the PMP) also provide groundwater elevation data that demonstrate hydraulic gradients on the Arizona side of the river (Figure 1-4). Groundwater and surface water elevation data from these locations are collected monthly using pressure transducers installed at each location.

Groundwater elevation data collected from the IM hydraulic monitoring network are used to develop potentiometric maps of shallow, mid-depth, and deep groundwater and measure hydraulic gradients of three well pairs (northern, central, and southern) to demonstrate compliance with the required 0.001 ft/ft landward hydraulic gradient. On August 18, 2017, the DTSC approved use of monitoring well MW-20-130 in place of well MW-45-095 in the central and southern gradient well pairs during months when extraction well PE-01 is not pumped for hydraulic control at the site (DTSC 2017b). The current gradient well pairs are:

- Northern Gradient Pair: MW-31-135 and MW-33-150
- When PE-01 is operated for hydraulic control:
    - Central Gradient Pair: MW-45-095 and MW-34-100
    - Southern Gradient Pair: MW-45-095 and MW-27-085
- When PE-01 is not operated for hydraulic control:
    - Central Gradient Pair: MW-20-130 and MW-34-100

- Southern Gradient Pair: MW-20-130 and MW-27-085

1.4.2.4 IM Contingency Plan Monitoring Wells

The IMCP was developed to detect and control possible migration of the Cr(VI) plume toward the Colorado River (DTSC 2005). Twenty-four IMCP wells were selected as part of an early detection system to detect any increases in chromium concentrations at areas of interest across the site (Figure 1-4, Table 1-2). The IMCP wells are sampled quarterly, as part of the GMP monitoring program (note that not all 24 wells are sampled each quarter), to determine if any increasing trends in Cr(VI) concentrations are observed. If Cr(VI) concentrations exceed the established trigger levels (based on historical Cr[VI] concentrations), then a contingency plan must be implemented in accordance with the Revised Contingency Plan Flow Chart (DTSC 2005; PG&E 2008).

1.4.2.5 IM Chemical Performance Monitoring Network

Eleven IM chemical performance monitoring wells are sampled annually or biennially to help evaluate performance of the future remedy (Figure 1-4, Table 1-2). Wells are sampled for an expanded chemistry suite (dissolved boron, bromide, dissolved calcium, chloride, dissolved magnesium, nitrate/nitrite as nitrogen, dissolved potassium, dissolved sodium, sulfate, total alkalinity [as calcium carbonate], total dissolved solids [TDS], and stable isotopes [oxygen-18 {δ18O} and deuterium {δ2H}]), which was last amended in 2008 (DTSC 2008b; PG&E 2008). Currently, nine monitoring wells and one river monitoring location (R-28) are sampled annually, and one well is sampled biennially (MW-26).

1.5 Sustainability

The GMP, RMP, and PMP programs strive to use sustainable sampling and data collection practices. This section briefly describes some of the sustainability practices now in use, which aim to reduce emissions from travel, reduce waste, conserve resources, and reduce potential impacts to nesting habitat and culturally sensitive areas.

- Groundwater sampling purge water is disposed on site via the IM-3 treatment plant and injection process.
- The RMP boat contractor is employed locally.
- Laboratory services are provided by a California-certified, Las Vegas-based lab.
- Cr(VI) and nitrate analytical methods were revised to methods with longer holding times.
- Reports are submitted via the DTSC website and electronically, and the number of hard copy quarterly report submittals has been reduced over time.
- Solar-powered data telemetry systems were installed at six key gradient compliance well locations located in floodplain areas with nesting habitat for sensitive avian species.
- Low-flow sampling methods are used at most wells screened in the Alluvial Aquifer, reducing the volume of purge water.

- For wells still using the three-volume purge sampling methods, pumps and tubing are sized for the optimum purge technique at each well.
- Utility vehicles (e.g., Polaris Ranger or Kawasaki Mule) and a 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.
- The IM-3 pumping regime was modified to allow 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.

2 FOURTH QUARTER 2019 MONITORING ACTIVITIES

This section summarizes the monitoring activities completed during Fourth Quarter 2019 for the GMP, RMP, and PMP programs.

2.1 Groundwater Monitoring Program

The Fourth Quarter 2019 GMP consisted of monthly and quarterly groundwater monitoring, and sampling method trials at select monitoring wells.

2.1.1 Monthly Groundwater Monitoring

Monthly GMP monitoring events were performed at IM extraction wells PE-01 and TW-03D in November and December 2019 and consisted of groundwater sampling. The monitoring well locations are shown on Figure 1-2 and listed in Table 1-2. Samples were collected from the tap of the extraction wells (see Table 1-2). During collection of each groundwater sample, field parameters were recorded (i.e., temperature, pH, specific conductivity, oxidation-reduction potential [ORP], turbidity, TDS, and salinity). Samples were sent to Asset Laboratories in Las Vegas, Nevada. Samples were analyzed for the following constituents:

- Cr(VI) and dissolved chromium
- General chemistry parameters: specific conductivity, pH, alkalinity, chloride, sulfate, and TDS
- Constituents of potential concern (COPCs): nitrate/nitrite as nitrogen
- In-situ byproducts: dissolved iron and dissolved manganese
- Cations: dissolved calcium, dissolved magnesium, and dissolved sodium.

2.1.2 Quarterly Groundwater Monitoring

The quarterly GMP monitoring event was performed from December 3 through 19, 2019 and consisted of groundwater sampling and inspection of 140 monitoring wells. Monitoring wells MW-57-050 and MW-58-065 were dry during the monitoring event, and the pump at extraction well TW-02S was not functioning; therefore, groundwater samples were not collected from these wells in Fourth Quarter 2019. The monitoring well locations are shown on Figure 1-2 and listed in Table 1-2. Samples were collected using one or multiple sampling methods including low-flow, three-volume purge, grab, or HydraSleeve sampling methods (see Table 1-2). During collection of each groundwater sample, field parameters were recorded (i.e., temperature, pH, specific conductivity, ORP, turbidity, TDS, and salinity). Samples were sent to Asset Laboratories in Las Vegas, Nevada. Samples collected from monitoring wells in Arizona were sent to EMAX Laboratories, Inc. in Torrance, California and Eurofins Eaton Analytical in Monrovia, California. Samples were analyzed for the following constituents (note that not all samples were analyzed for the complete analytical suite listed below):

- Cr(VI) and dissolved chromium (samples collected from Park Moabi wells Park Moabi-3 and Park Moabi-4 were also analyzed for total chromium)
- General chemistry parameters: Specific conductivity
- COPCs: dissolved molybdenum, dissolved selenium, and nitrate/nitrite as nitrogen

- In-situ byproducts: dissolved arsenic, dissolved iron, and dissolved manganese
- Cations: dissolved calcium, dissolved magnesium, dissolved potassium, and dissolved sodium.

In addition, 10 monitoring wells (MW-10, MW-12, MW-14, MW-22, MW-24A, MW-24B, MW-26, MW-35-060, MW-35-135, and MW-59-100) were analyzed for Title 22 metals, listed in California Code of Regulations, Title 22, Section 66261.24(a)(2)(A), which consist of the following constituents (dissolved): antimony, arsenic, barium, beryllium, cadmium, cobalt, chromium, copper, lead, mercury, molybdenum, nickel, selenium, silver, thallium, vanadium, and zinc.

2.1.3 Sampling Method Trials at Select Wells

In accordance with a June 27, 2014 email from the DTSC, PG&E began conducting sampling method trials to directly compare two different sampling methods (DTSC 2014). In August 2015, PG&E sent a letter to the DTSC recommending additional wells for low-flow sampling and proposing additional sampling method trials for select bedrock wells (PG&E 2015). The DTSC responded to this request with technical memoranda on April 6 and October 20, 2017, which provided conditional approval for actions including expanding the sampling method trials to specific long-screen and bedrock wells (DTSC 2017a, 2017c).

Sampling method trials were conducted at 10 monitoring wells during the 2018 Annual Reporting Period (January through December 2018) and were discontinued at nine of the 10 monitoring wells in Second Quarter 2019. The sampling method trial at MW-60BR-245 (comparing low-flow and three-volume purge sampling methods) continued in the 2019 Annual Reporting Period; an evaluation of the sampling method trial is provided in Section 4.1.3.

2.2 Surface Water Monitoring Program

Fourth Quarter 2019 RMP monitoring was performed on November 20 and 21, 2019, and consisted of collecting 25 surface water samples from 16 locations. At nine of the 16 locations, samples were collected from two depth intervals: shallow (1 foot below water surface) and deep (1 foot above the river bottom). The surface water locations are shown on Figure 1-3 and listed in Table 1-2. During collection of each surface water sample, field parameters were recorded (i.e., temperature, pH, specific conductivity, ORP, turbidity, TDS, and salinity). Samples were sent to Asset Laboratories in Las Vegas, Nevada for analysis of the following constituents:

- Cr(VI) and dissolved chromium
- General chemistry parameters: Specific conductivity and pH
- COPCs: dissolved molybdenum, dissolved selenium, and nitrate/nitrite as nitrogen
- In-situ byproducts: dissolved arsenic, total and dissolved iron, and dissolved manganese
- Geochemical Parameters: dissolved barium and total suspended solids (TSS).

2.3 IM Performance Monitoring Program

IM performance monitoring in Fourth Quarter 2019 consisted of groundwater chromium monitoring within the floodplain area, a review of IM extraction system operation, IM hydraulic monitoring, and IM chemical performance monitoring. In addition, Cr(VI) and dissolved chromium data collected during chromium monitoring activities were used to monitor shutdown of extraction well PE-01 and evaluate the need to implement the IMCP.

2.3.1 Chromium Monitoring

Chromium monitoring was performed as part of the monthly and quarterly GMP monitoring activities. One-hundred and 40 monitoring wells were sampled for Cr(VI) in December 2019. Extraction wells PE-01 and TW-03D were sampled monthly in November and December 2019. The monitoring well locations are shown on Figure 1-4 and listed in Table 1-2. Cr(VI) analytical results were used to evaluate Cr(VI) distribution in the floodplain area.

2.3.2 IM Extraction System Operation

The IM extraction system was operated in November and December 2019. Pumping rates, planned or unplanned downtime, and the volume of groundwater extracted from each IM extraction well were documented. Daily IM-3 inspections were performed, including general facility inspections, flow measurements, and site security monitoring. Daily logs with documentation of inspections are maintained on site.

Wells Monitored for Conditional Shutdown of PE-01

As discussed in Section 1.4.2.2, 47 GMP monitoring wells were sampled for Cr(VI) and dissolved chromium in Fourth Quarter 2019 as part of the conditional approval for PE-01 shutdown. The monitoring well locations are shown on Figure 1-2 and listed in Table 1-2. Results were evaluated against the maximum detected Cr(VI) and dissolved chromium concentrations from 2014 (or 2013 for wells sampled biennially).

2.3.3 IM Hydraulic Monitoring

Groundwater elevation data from monitoring wells and river monitoring locations within the IM hydraulic monitoring network are measured using pressure transducers, which record continuous water levels at 30-minute intervals. Pressure transducers were downloaded in Fourth Quarter 2019 during the first two weeks of each month (November and December) from the 52 monitoring wells in the IM hydraulic monitoring network, two river monitoring locations (I-3 and RRB), and five wells located on the Arizona side of the Colorado River. The monitoring well and river monitoring locations are shown on Figure 1-4 and listed in Table 1-2. Pressure transducers at the six gradient control monitoring wells (MW-27-085, MW-31-135, MW-33-150, MW-34-100, MW-45-095, and MW-20-130) were downloaded via a cellular telemetry system.

2.3.4 IM Contingency Plan Monitoring

As discussed in Section 1.4.2.4, 24 IMCP monitoring wells were sampled for Cr(VI) as part of the Fourth Quarter 2019 GMP program. The monitoring well locations are shown on Figure 1-4 and listed in Table 1-2. Results were evaluated against established trigger levels (based on historical Cr[VI] concentrations).

2.3.5 IM Chemical Performance Monitoring

Nine monitoring wells and one river monitoring location (R-28) were sampled in December 2019 as part of IM Chemical Performance Monitoring, an expanded chemistry suite used to evaluate long-term trends in general water quality response to IM groundwater extraction. The monitoring well locations are shown on Figure 1-4 and listed in Table 1-2. Field parameters, including temperature, pH, specific conductivity, ORP, turbidity, TDS, and salinity, were collected during collection of each groundwater sample. Samples were sent to Asset Laboratories in Las Vegas, Nevada for analysis of the following constituents:

- Boron
- Bromide
- Cations (calcium, magnesium, potassium, sodium)
- Chloride
- Nitrate/nitrite as nitrogen
- Stable isotopes (as δ18O and δ2H)
- Sulfate
- Total alkalinity as calcium carbonate
- TDS.

3 FOURTH QUARTER 2019 SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING RESULTS

This section summarizes results from the groundwater and surface water monitoring activities performed during Fourth Quarter 2019 for the GMP and RMP programs.

3.1 Groundwater Monitoring Results

3.1.1 Cr(VI) and Dissolved Chromium

Table 3-1 presents the Fourth Quarter 2019 groundwater sample results for Cr(VI) and dissolved chromium, as well as general chemistry parameters (specific conductivity, ORP, pH, and turbidity). The laboratory reports for samples analyzed during Fourth Quarter 2019 are provided in Appendix A.

Figures 3-1a, 3-1b, and 3-1c show the distribution of Cr(VI) concentrations across the site in wells monitoring the upper-depth (shallow), mid-depth, and lower-depth (deep) intervals of the Alluvial Aquifer and bedrock. These figures 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 2009). The extent of the Cr(VI) plume is consistent with previous years.

During Fourth Quarter 2019, the maximum detected Cr(VI) and dissolved chromium concentrations were 34,000 µg/L and 37,000 µg/L (both at MW-68-180), respectively.

3.1.2 Contaminants of Potential Concern and In-Situ Byproducts

Table 3-1 presents the Fourth Quarter 2019 groundwater sample results for COPCs (dissolved molybdenum, dissolved selenium, and nitrate/nitrite as nitrogen) and in-situ byproducts (dissolved arsenic, dissolved iron, and dissolved manganese).

Figures 3-2a through 3-2e present Fourth Quarter 2019 COPC and in-situ by-product results in plan view for wells monitoring the upper-depth (shallow), mid-depth, and lower-depth (deep) intervals of the Alluvial Aquifer and bedrock. Results are compared to the calculated background UTLs from the background study (CH2M Hill 2009a, 2009b) and United States Environmental Protection Agency (USEPA) maximum contaminant levels (MCLs; USEPA 2017) 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. The figures also show the interpreted extent of groundwater Cr(VI) concentrations higher than 32 µg/L (calculated natural background UTL) for each depth interval.

A summary of Fourth Quarter 2019 COPC and in-situ byproduct results is provided in the table below.

Summary of Fourth Quarter 2019 COPC and In-Situ Byproduct Results

Constituent (No. of wells sampled)	Calculated Background UTL (No. of exceedances in Q4 2019)	USEPA MCL (No. of exceedances in Q4 2019)	Q4 2019 Highest Detected Concentration (Location)
Dissolved molybdenum (139)	36.3 µg/L (45)	None	330 µg/L (MW-46-205)
Dissolved selenium (131)	10.3 µg/L (11)	50 µg/L (2)	270 J µg/L (MW-67-185)
Nitrate/nitrite as nitrogen (87)	5.03 mg/L (20)	10 mg/L (15)	76 mg/L (MW-67-185)
Dissolved arsenic (106)	24.3 µg/L (1)	10 µg/L (9)	43 µg/L (MW-12)
Dissolved iron (133)	None	300 µg/L* (33)	29,000 (PGE-07BR)
Dissolved manganese (142)	1,320 µg/L (2)	50 µg/L* (59)	6,100 µg/L (MW-22)

Notes:

Except for nitrite/nitrite as nitrogen, calculated background UTLs are applicable to only the dissolved fractions for the listed analytes, while the USEPA MCLs are applicable to total fractions.
* = Secondary MCL
No. = number

3.1.3 Title 22 Metals

Table 3-2 presents the Title 22 metals groundwater sample results for Fourth Quarter 2019. Results are compared to the California MCLs where available.

Groundwater concentrations for the Title 22 metals were below the California MCLs at the 10 monitoring wells where samples were analyzed for all of the Title 22 metals (MW-10, MW-12, MW-14, MW-22, MW-24A, MW-24B, MW-26, MW-35-060, MW-35-135, and MW-59-100) with the following exceptions:

- Dissolved chromium (MCL 50 µg/L) was exceeded at MW-10 (230 µg/L), MW-12 (1,800 µg/L), MW-24B (230 µg/L), MW-26 (2,400 µg/L), and MW-59-100 (2,800 µg/L).

3.1.4 Well Maintenance

Monitoring wells were inspected during groundwater sampling activities in Fourth Quarter 2019. No corrective or maintenance actions were needed. Appendix B provides a summary of the inspection results.

3.2 Surface Water Monitoring Results

3.2.1 Cr(VI) and Dissolved Chromium

Table 3-3 presents the Fourth Quarter 2019 surface water sample results for Cr(VI) and dissolved chromium, as well as general chemistry parameters (pH and specific conductivity). Cr(VI) and dissolved chromium were not detected at concentrations higher than reporting limits at any surface water

monitoring location. The laboratory reports for samples analyzed during Fourth Quarter 2019 are provided in Appendix A.

3.2.2 Contaminants of Potential Concern and In Situ Byproducts

Table 3-3 presents the Fourth Quarter 2019 surface water results for COPCs (dissolved molybdenum, dissolved selenium, and nitrate/nitrite as nitrogen), in-situ byproducts (dissolved arsenic, total iron, dissolved iron, and dissolved manganese), and other geochemical indicator parameters (dissolved barium and TSS). Maximum concentrations for each constituent are summarized below (with associated locations):

- Dissolved molybdenum: 6.3 µg/L (RRB)
- Dissolved selenium: 1.8 µg/L (C-NR1-D, C-NR4-D, R-28)
- Nitrate/nitrite as nitrogen: 0.31 mg/L (C-R27-S)
- Dissolved arsenic: 2.4 µg/L (C-MAR-D, C-MAR-S, RRB)
- Total iron: 2,000 µg/L (C-MAR-D)
- Dissolved iron: 1,800 µg/L (R-19)
- Dissolved manganese: 590 µg/L (RRB)
- Dissolved barium: 300 µg/L (RRB)
- TSS: 90 mg/L (C-MAR-S).

3.3 Data Validation and Completeness

Laboratory analytical data from the Fourth Quarter 2019 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 the Fourth Quarter 2019:

- Thirty-six Cr(VI) results exhibited a matrix interference issue that required a dilution to achieve satisfactory matrix spike recovery, resulting in an elevated reporting limit. No flags were applied.
- Dissolved boron was recovered greater than quality control (QC) criteria in instrument QC analyses which affected numerous samples. The associated sample data was qualified as estimated detects and “J” flagged.
- Dissolved boron was detected in calibration blanks greater than the method detection limits but less than the reporting limit. Several low-level sample detects were qualified as non-detects and “U” flagged.
- Four TDS sample detected results were qualified as estimated detects, and “J” flagged due to lack of precision in the laboratory duplicate pair.
- *Sample MW-10-Q419*. Dissolved vanadium was recovered at a concentration less than QC limits in the post digestion spike of sample MW-10-Q419. The associated sample was qualified as an estimated detect and flagged “J.”

- *Sample MW-12-Q419.* Dissolved arsenic, dissolved beryllium, dissolved calcium, dissolved cobalt, dissolved copper, dissolved magnesium, dissolved nickel, dissolved selenium, and dissolved zinc were recovered at concentrations less than QC criteria in either the matrix and analytical spikes or did not meet precision criteria in sample MW-12-Q419. The associated detects and non-detects were flagged “J” and “UJ,” respectively, except for dissolved nickel and dissolved zinc, which were not recovered in the matrix and analytical spike and rejected for project use and flagged “R.”
- *Sample MW-14-1Q419.*
    - The initial calibration verification standard associated with the dissolved thallium analysis of sample MW-14-1Q419, was recovered less than QC criteria and the associated non-detect result was qualified as estimated and flagged “UJ.”
    - Dissolved barium and dissolved molybdenum were recovered at concentrations greater than QC limits in the matrix spikes of sample MW-14-Q419. Dissolved barium also did not meet QC criteria in the serial dilution analysis. Dissolved molybdenum also was recovered at concentrations greater than QC criteria of the analytical spike. The associated parent sample was qualified as an estimated detect and flagged “J.”
    - Dissolved iron was recovered at concentrations less than QC limits in the matrix spikes of sample MW-14-Q419. The associated parent sample was qualified as an estimated detect and flagged “J.”
    - Dissolved zinc was not recovered in the matrix or analytical spikes of sample MW-14-Q419. The associated non-detect result was flagged “R.”
    - The dissolved boron analytical spike of sample MW-14-Q419 was recovered at a concentration greater than QC limits and the associated result was flagged “J.”
    - The dissolved mercury analytical spike of sample MW-14-Q419 was recovered at a concentration less than QC limits and the associated result was flagged “UJ.”
- *Sample MW-20-130-Q419*.
    - Dissolved selenium was recovered greater than QC limits in the matrix and analytical spike of sample MW-20-130-Q419. The associated detected result was qualified as estimated, flagged “J.”
    - Dissolved potassium was recovered at concentrations less than QC limits in the matrix and analytical spike of sample MW-20-130-Q419, and the serial dilution analysis did not meet QC criteria. The associated detect result was qualified as estimated, flagged “J.“
    - Dissolved magnesium was recovered greater than QC limits in the matrix spike of sample MW-20-130-Q419. The associated detected result was qualified as estimated, flagged “J.”
    - The dissolved arsenic and dissolved sodium analyses did not meet QC criteria in the serial dilution analysis in sample MW-20-130-Q419 and the associated detected results were qualified as estimated detects and flagged “J.”

- *Sample MW-24A-Q419*. Dissolved molybdenum was recovered at concentrations greater than QC limits in the analytical spike and less than QC limits in the matrix spike of sample MW-24A-Q419. The associated sample was qualified as an estimated detect and flagged "J."
- *Sample MW-24B-Q419*. Dissolved manganese demonstrated a relative percent difference greater than QC criteria for the field duplicate pair of samples MW-24B-Q419/MW-907-Q419. The associated results were qualified as estimated. The detected sample in the pair is flagged "J" and the non-detected is "UJ."
- *Sample MW-26-Q419.*
    - The dissolved mercury analysis of sample MW-26-Q419 was analyzed past the USEPA recommended hold-time by request. The sample result was rejected for project decision-making.
    - Dissolved potassium was recovered at concentrations less than QC limits in the matrix and analytical spikes of sample MW-26-Q419. The associated parent sample was qualified as an estimated detect and flagged "J."
- *Sample MW-35-060-Q419.*
    - Dissolved nickel and dissolved zinc were recovered at concentrations less than QC limits in the matrix and analytical spikes of sample MW-35-060-Q419. The associated non-detect results were qualified as estimated, flagged "UJ."
    - The dissolved beryllium and dissolved cobalt analytical spike of sample MW-35-060-Q419 were recovered at concentrations less than QC limits and the associated non-detect results were flagged "UJ."
    - Dissolved sodium did not meet QC criteria in the serial dilution analysis in sample MW-35-060-Q419 and the associated detected result was qualified as estimated, flagged "J."
- *Sample MW-54-140-Q419*. Dissolved selenium was not recovered in the matrix spikes of sample MW-54-140-Q419. Twelve samples were qualified as rejected and flagged "R" because of matrix interference.
- *Samples MW-39-050-Q419, MW-40D-Q419 MW-62-110-Q419, and PGE-07BR-Q419.*
    - Dissolved magnesium did not meet QC criteria in the serial dilution analyses of samples MW-39-050-Q419, MW-40D-Q419 MW-62-110-Q419, and PGE-07BR-Q419. Additionally, dissolved arsenic and dissolved calcium did not meet QC criteria in the serial dilution analysis of sample MW-40D-Q419. The associated detected results were qualified as estimated and flagged "J."
    - Dissolved iron was recovered at concentrations greater than QC limits in the analytical spikes of samples MW-40D-Q419 and MW-62-110-Q419. The associated detected results were flagged "J."
- *Sample MW-67-185-Q419*.
    - Dissolved selenium was recovered at a concentration less than QC limits in the matrix spike of sample MW-67-185-Q419. The associated parent sample was qualified as an estimated detect and flagged "J."

  - Total dissolved chromium was recovered greater than QC limits in the matrix spikes of sample MW-67-185-Q419. The associated detected result was qualified as estimated and flagged "J."

- *Sample TW-03D-1119.* The initial calibration verification standard associated with nitrate/nitrate as nitrogen analysis of sample TW-03D-1119 was recovered greater than QC limits and the associated detected result was qualified as estimated and flagged "J."
- *Sample C-BNS-Q419*. Dissolved molybdenum was recovered at concentrations less than QC limits in the matrix spikes of C-BNS-Q419. The associated parent sample was qualified as an estimated detect and flagged "J."
- *Sample R-28-Q419*. Dissolved iron was recovered at concentrations less than QC limits in the matrix spikes of sample R-28-Q419. The associated parent sample was qualified as an estimated detect and flagged "J."
- *Samples C-MAR-S-Q419 and MW-25-Q419*. Iron and dissolved iron demonstrated a relative percent difference greater than QC criteria for the field duplicate pair of samples C-MAR-S-Q419/MW-901-Q419 and dissolved iron only in the field duplicate pair of samples MW-25-Q419/MW-908-Q419. 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 2019 sampling event analyzed in a certified lab are considered estimated.

No other significant analytical deficiencies were identified in the Fourth Quarter 2019 data. Additional details are provided in the data validation reports kept in the project file and available upon request.

4 ANNUAL SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING RESULTS

This section summarizes groundwater and surface water monitoring results from the Annual Reporting Period for the GMP and RMP programs. Field forms and a summary of field parameters from the groundwater and surface water monitoring events performed January through December 2019 are provided in Appendices C and D, respectively.

4.1 Groundwater Monitoring Results

4.1.1 Cr(VI) and Dissolved Chromium

Cr(VI) and dissolved chromium results from January through December 2019 are presented in Table 3-1. Historical Cr(VI) and dissolved chromium concentration results from January 2018 through December 2019 are presented in Appendix E.

During the Annual Reporting Period, the maximum detected Cr(VI) and dissolved chromium concentrations were collected at monitoring well MW-68-180 (37,000 and 42,000 µg/L, respectively).

Appendix F presents concentration-versus-time graphs for Cr(VI). Throughout the Annual Reporting Period, Cr(VI) concentrations were generally within historical ranges and/or consistent with historical concentration trends. Additional discussion about the distribution of Cr(VI) across the floodplain is presented in Sections 5.1 and 6.1.

4.1.2 Contaminants of Potential Concern and In-Situ Byproducts

Groundwater COPCs (dissolved molybdenum, dissolved selenium, and nitrate/nitrite as nitrogen) and in-situ by-product (dissolved arsenic, dissolved iron, and dissolved manganese) results from January through December 2019 are presented in Table 3-1.

COPC Evaluation

Maximum COPC concentrations detected during the Annual Reporting Period are summarized below (with associated locations):

- Dissolved molybdenum: 330 µg/L (MW-46-205)
- Dissolved selenium: 400 µg/L (MW-67-185)
- Nitrate/nitrite as nitrogen: 79 mg/L (MW-67-185).

Appendix F presents concentration-versus-time graphs for the COPCs. Throughout the Annual Reporting Period, concentrations of these constituents were generally within historical ranges and/or consistent with historical concentration trends.

In-Situ Byproduct Evaluation

Dissolved arsenic, dissolved iron, and dissolved manganese samples were collected during the Annual Reporting Period to establish baseline conditions of in-situ byproducts that may be released upon

implementation of the groundwater remedy. Figure 4-1 shows comparisons of these in-situ byproducts to Cr(VI) concentrations and other redox indicators (i.e., nitrate/nitrite as nitrogen and ORP) in plan view for wells monitoring the upper-depth, mid-depth, and lower-depth intervals of the Alluvial Aquifer and bedrock. Figure 4-2 shows these same comparisons along cross-section A, oriented west-to-east across the floodplain. The location of cross-section A is shown on Figure 1-4.

The distribution of the redox indicators across the site is generally consistent with previous years. Reducing conditions are prevalent in wells located near the Colorado River, where there is a higher level of organic material in the fluvial sediments compared to wells completed in alluvial sediments with a lower organic carbon content located farther west from the Colorado River.

4.1.3 Sampling Method Trial Evaluation

During the Annual Reporting Period, sampling method trials were performed at monitoring well MW-60BR-245 to compare the low-flow and three-volume purge sampling methods (see table below). The methodology used to evaluate the sampling method trial results, and a summary of trial results is provided in the following sections.

Summary of Sampling Method Trials

Location ID	Sampling Method Trial	Low-Flow Depth Interval (ft bgs)	No. of Paired Sample Trials to Date	Recommendation
MW-60BR-245	3V vs. LF	175, 238	8	Continue sampling method trials

Notes:
3V = three-volume purge method
ft bgs = feet below ground surface
ID = identification
LF = low-flow purge method

4.1.3.1 Evaluation Methodology

Sampling method trial data were evaluated using the two evaluation components outlined below. Based on the evaluation results, a recommendation was made to change the sampling method, keep the existing sampling method and discontinue the trial, or continue performing the sampling method trial to collect additional data.

Visual Evaluation of Datasets

Cr(VI) and dissolved chromium datasets were examined for both sampling methods. The datasets were compared to see if the methods provided similar results and/or demonstrated similar variability.

Relative Percent Difference Calculations

Relative percent difference (RPD) calculations were performed for paired analytical results from each sampling method trial. RPDs were calculated for Cr(VI) and dissolved chromium using the following equation:

$$\text{RPD} = \left(\frac{\text{Absolute value of (sampling method \#1 concentration) – (sampling method \#2 concentration)}}{\text{Average of sampling method \#1 concentration and sampling method \#2 concentration}}\right) x\ 100$$

RPDs were compared to a threshold of 20 percent. However, if the concentration of either sample result within a sample pair was less than or equal to five times the reporting limit, then a control limit of two times the reporting limit was applied. These criteria were selected because they are the criteria used in the Quality Assurance Project Plan to compare parent and duplicate sample results. For consistency purposes, a reporting limit of 1 µg/L was used for Cr(VI) and dissolved chromium results at each monitoring well.

If RPDs were less than the 20 percent threshold, or if concentrations were within the control limit of two times the reporting limit, then the two sampling methods were considered comparable. If RPDs were greater than the 20 percent threshold, or if concentrations were outside the control limit of two times the reporting limit, then Cr(VI) concentrations from both sampling methods were compared to the calculated Cr(VI) background concentration (32 µg/L; CH2M 2009b) to determine if either sampling method would provide different conclusions about the extent of the plume boundary. For example, if Cr(VI) concentrations from both sampling methods are consistently above or consistently below the background concentration, then either sampling method can be used to delineate the plume boundary. However, if Cr(VI) concentrations from one sampling method are above background, and concentrations from the second sampling method are below background, then additional evaluation and/or data are needed to determine which sampling method is most appropriate for delineating the plume boundary.

4.1.3.2 Evaluation Results

Table 4-1 presents the paired sampling method trial analytical results for monitoring well MW-60BR-245. Results of the sampling method trial evaluation and associated recommendations are summarized below.

Eight paired sampling method trials were performed at two different depth intervals: 175 and 238 feet bgs.

- During the sampling method trials from December 2017 through February 2019 (six trials), groundwater samples were collected using the low-flow method first followed by 3V method.
    - Visual evaluation of the Cr(VI) and dissolved chromium datasets from December 2017 through February 2019 shows that concentrations measured in samples collected using the low-flow method are consistently lower than those measured in samples collected using the 3V method.

Low-flow Cr(VI) concentrations ranged from non-detect to 25 µg/L, whereas 3V Cr(VI) concentrations ranged from 69 µg/L to 110 µg/L during the same time period[1].

- In each of the six trials (from December 2017 through February 2019), the RPDs for Cr(VI) and dissolved chromium are greater than the 20% threshold and/or concentrations are outside the control limit of two times the reporting limit.

- Based on the results of the December 2017 through February 2019 trials, the groundwater sampling protocol for this monitoring well was revised in May 2019 and December 2019 to collect samples using the 3V method first followed by the low-flow method. Groundwater samples were not collected from this monitoring well in Third Quarter 2019 due to site construction activities for the final groundwater remedy.
  - Visual evaluation of the Cr(VI) and dissolved chromium datasets from May 2019 shows that concentrations measured in samples collected using the low-flow method are lower than those measured in the sample collected using the 3V method. Low-flow Cr(VI) concentrations were 85 µg/L (175-foot depth interval) and 68 µg/L (238-foot depth interval) and the 3V Cr(VI) concentration was 130 µg/L. However, in December 2019, Cr(VI) and dissolved chromium concentrations measured in samples collected using the low-flow method are generally consistent with the 3V method. Low-flow Cr(VI) concentrations were 86 µg/L (175-foot depth interval) and 75 µg/L (238-foot depth interval) and the 3V Cr(VI) concentration was 64 µg/L.
  - In May 2019 and December 2019 (for the 175-foot depth interval), the RPDs for Cr(VI) and dissolved chromium are above the 20% threshold. However, for the 238-foot depth interval in December 2019, the RPDs between the low-flow method and 3V method for Cr(VI) and dissolved chromium are less than the 20% threshold.
  - During the May 2019 and December 2019 trials, Cr(VI) concentrations measured in samples collected using the low-flow and 3V methods were above the background concentration of 32 µg/L.
- During the eight sampling method trials, low-flow Cr(VI) and dissolved chromium concentrations at both depth intervals were similar. Cr(VI) concentrations ranged from non-detect to 86 µg/L at the 175-foot depth interval and from non-detect to 75 µg/L at the 238-foot depth interval.

Recommendation: Continue the low-flow versus 3V method sampling method trials at the two depth intervals in 2020. Continue to collect groundwater samples using the 3V method first followed by the low-flow method.

[1] Cr(VI) results from the December 2017 sampling method trial are not included in range of concentrations because they are considered anomalous.

4.2 Surface Water Monitoring Results

4.2.1 Cr(VI) and Dissolved Chromium

Cr(VI) and dissolved chromium were not detected at concentrations higher than reporting limits at any surface water monitoring location during the Annual Reporting Period, except at location R-19, where the dissolved chromium concentration was detected at 1.7 µg/L in First Quarter 2019. Surface water sampling results from January through December 2019 are presented in Table 3-3.

4.2.2 Contaminants of Potential Concern and In-Situ Byproducts

Sampling results from January through December 2019 for surface water COPCs (dissolved molybdenum, dissolved selenium, and nitrate/nitrite as nitrogen), in-situ byproducts (dissolved arsenic, total iron, dissolved iron, and dissolved manganese), and other geochemical indicator parameters (barium and TSS) are presented in Table 3-3.

Maximum concentrations for each constituent detected during the Annual Reporting Period are summarized below (with associated locations):

- Dissolved molybdenum: 6.3 µg/L (RRB)
- Dissolved selenium: 2.4 µg/L (C-1-3-S)
- Nitrate/nitrite as nitrogen: 7.2 mg/L (C-CON-S)
- Dissolved arsenic: 2.5 µg/L (C-CON-D)
- Total iron: 2,000 µg/L (C-MAR-D)
- Dissolved iron: 1,800 µg/L (R-19)
- Dissolved manganese: 590 µg/L (RRB)
- Dissolved barium: 300 µg/L (RRB)
- TSS: 90 mg/L (C-MAR-S).

4.3 Annual Groundwater and Surface Water Monitoring Summary

A summary of groundwater and surface water results from the Annual Reporting Period is provided below.

- Cr(VI) and COPC (dissolved molybdenum, dissolved selenium, and nitrate/nitrite as nitrogen) concentrations in groundwater were generally within historical ranges and/or consistent with historical concentration trends.
- Reducing conditions are prevalent in wells located near the Colorado River, where there is a higher level of organic material in the fluvial sediments compared to wells located farther west from the Colorado River completed in alluvial sediments with a lower organic carbon content.

- Assessment of the low-flow versus 3V sampling method trials at monitoring well MW-60BR-245 supports a recommendation that the sampling method trials should continue in 2020.
- Cr(VI) and dissolved chromium concentrations were not detected at the Colorado River monitoring locations, except for one detection of dissolved chromium at monitoring location R-19 in First Quarter 2019.

5 FOURTH QUARTER 2019 IM PERFORMANCE MONITORING PROGRAM EVALUATION

This section summarizes results of the Fourth Quarter 2019 PMP evaluation.

5.1 Distribution of Hexavalent Chromium in the Floodplain

Cr(VI) data collected as part of the Fourth Quarter 2019 GMP monitoring activities were used to generate maps, cross-sections, and concentration time series charts to demonstrate that Cr(VI) concentrations greater than 20 µg/L in the floodplain area are contained for removal and treatment.

Distribution of Cr(VI) concentrations in the upper-depth (shallow wells), mid-depth, and lower-depth (deep wells) intervals of the Alluvial Aquifer is shown in plan-view and cross-section view (cross-section A) on Figure 5-1. Figure 5-2 presents Cr(VI) concentrations for cross-section B, oriented parallel to the Colorado River. The locations of cross-sections A and B are shown on Figure 5-1. The figures demonstrate that Cr(VI) concentrations decrease from west to east along the floodplain (cross-section A) and that concentrations greater than 20 µg/L are contained in the floodplain area.

5.2 IM Extraction System Operation

During Fourth Quarter 2019, IM extraction well TW-03D operated at an average pumping rate of 128.3 gallons per minute (gpm) to support hydraulic control. The target pumping rate was 135 gpm. Extraction well PE-01 was only operated for brief periods to support IM-3 system maintenance and sampling. Extraction wells TW-02S and TW-02D was not operated.

The IM-3 system extracted and treated 11,271,753 gallons of groundwater during Fourth Quarter 2019, and an estimated 86.1 pounds (39.1 kilograms) of chromium were removed from the aquifer between October 1 and December 31, 2019 (Table 5-1). Note that groundwater extraction is reported on a different schedule than chromium removal reporting (i.e., November through December and October through December, respectively; Table 5-1). The operational runtime percentage for the IM-3 system during Fourth Quarter 2019 was 96.1 percent. Appendix G provides the operations log for the IM-3 system, including planned and unplanned downtime.

Chromium Concentrations in Wells Monitored for Conditional Shutdown of PE-01

During Fourth Quarter 2019, Cr(VI) and dissolved chromium concentrations in 37 out of 47 monitoring wells were lower than the 2014 (or 2013 where appropriate) maximum concentrations (i.e., notification levels). Cr(VI) concentrations detected at monitoring wells MW-20-070 (2,300 µg/L), MW-31-135 (13 µg/L), MW-39-080 (0.52 µg/L), MW-39-100 (87 µg/L), and MW-47-055 (21 µg/L) exceeded their respective notification levels; and, dissolved chromium concentrations at monitoring wells MW-26 (2,400 µg/L), MW-27-020 (1.1 µg/L), MW-31-135 (14 µg/L), MW-33-210 (15 µg/L), MW-39-080 (2.5 µg/L), MW-39-100 (82 µg/L),MW-47-055 (18 µg/L), MW-46-205 (6.2 µg/L), and MW-47-115 (22 µg/L) exceeded their respective notification levels. The DTSC was notified of the exceedances at the 10 locations via email on February 16, 2020. Shutdown of extraction well PE-01 continued through the end of Fourth Quarter 2019. Table 5-2 presents the Cr(VI) and dissolved chromium concentrations and their associated notification levels.

5.3 IM Hydraulic Monitoring Results

Table 5-3 presents the Fourth Quarter 2019 average monthly and quarterly groundwater and river elevations, calculated from the pressure transducer data. Average daily groundwater and river elevations are provided as hydrographs in Appendix H. Groundwater elevations were adjusted for temperature and salinity differences among wells (i.e., adjusted to a common freshwater equivalent).

Hydraulic Gradient Evaluation: California Floodplain

Figures 5-3a, 5-3b, and 5-3c present the average Fourth Quarter 2019 groundwater elevations and associated groundwater contours for the shallow, mid-depth, and deep wells, respectively. Figure 5-4 presents the average groundwater elevations and associated groundwater contours for wells located in the floodplain along cross-section A. Due to complex vertical gradients present at portions of the Topock site, water levels for some wells are not considered in the contouring on Figures 5-3a, 5-3b, 5-3c, or 5-4.

During Fourth Quarter 2019, hydraulic gradients were measured for three gradient well pairs selected for performance monitoring of the IM-3 system (shown on Figure 1-4; note that PE-01 was not operated for hydraulic control):

- Northern Gradient Pair: MW-31-135 and MW-33-150
- Central Gradient Pair: MW-20-130 and MW-34-100
- Southern Gradient Pair: MW-20-130 and MW-27-085.

As discussed in Section 1.4.2.3, a landward hydraulic gradient of 0.001 ft/ft must be maintained to demonstrate compliance with the performance standard. Table 5-4 presents the monthly average hydraulic gradients measured for each of the gradient well pairs in Fourth Quarter 2019, as well as the overall average of all well pairs. The overall monthly average gradients for all well pairs were 0.0046 and 0.0034 ft/ft for November and December 2019, respectively. Landward gradients measured each month exceeded the 0.001 ft/ft requirement, as shown in Table 5-4. Figure 5-5 illustrates the measured hydraulic gradients during Fourth Quarter 2019 with the concurrent Colorado River elevations and IM-3 pumping rates.

Hydraulic Gradient Evaluation: Arizona Side of the Colorado River

During Fourth Quarter 2019, pressure transducer data were recorded in five wells located on the Arizona side of the Colorado River. The average quarterly groundwater elevations for monitoring wells MW-54-085, MW-54-140, MW-54-195, MW-55-045, and MW-55-120 are presented on Figures 5-3b and 5-3c and are used for contouring where appropriate. Except for 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 (Figure 5-3b). Average quarterly water levels at the MW-54 and MW-55 well clusters indicate that water level elevations in monitoring wells in Arizona are higher than those in wells across the river on the California floodplain. This indicates 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.

5.4 IM Contingency Plan Monitoring Results

During Fourth Quarter 2019, Cr(VI) concentrations in the 24 IMCP monitoring wells sampled were lower than the established trigger levels; therefore, implementation of the contingency plan was not needed. Cr(VI) concentrations for the IMCP wells and their associated trigger levels are presented in Table 5-5.

5.5 IM Chemical Performance Monitoring Results

Table 5-6 presents Fourth Quarter 2019 IM chemical performance monitoring results. Appendix I presents the chemical performance monitoring results from March 2005 through December 2019.

5.5.1 Stable Isotope Evaluation

Analysis of oxygen-18 (δ18O) and deuterium (δ2H) provides a method of tracking the mixing occurring in floodplain groundwater as a result of IM extraction. The lighter isotopic signatures (left side of Figure 5-6) are generally found in the Colorado River (R-28) and fluvial “non-plume” well samples, whereas the heaviest isotopic signatures are found in selected alluvial “plume” wells (e.g., MW-20-130 on the right side of the plot), which likely contain higher percentages of water that has flowed from the upland areas (Figure 5-6).

Previous reports evaluated the effects of IM pumping on the isotopic signature of floodplain wells. In 2015, isotopic data suggested that the isotopic signature in most plume 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, which has caused mixing of plume groundwater with river-influenced groundwater (CH2M Hill 2015).

Figure 5-6 shows the water isotope results for plume samples (green points) compared with non-plume samples (purple points), including a comparison of 2019, 2018, and 2017 data to evaluate temporal changes in the isotopic signature. The comparison illustrates that several wells (including plume and non-plume wells) exhibit a lighter oxygen isotope signature in 2019 relative to 2017; however, these decreases appear to be more significant in δ18O than in δ2H, such that many of the data points do not fall along an anticipated dilution curve, which would be expected to bisect the data running parallel to the global meteoric water line. The trend was also noted in 2018; however, in many cases, the δ18O values appeared to return closer to 2017 values in 2019. Specific observations include the following:

- Several plume wells, including alluvial plume wells MW-20-130, MW-20-070, and MW-20-100, show a significant decrease in δ18O between 2017 and 2019. Although this may be consistent with dilution with a lighter water, a similar level of decrease was not observed in δ2H and the trends do not parallel the dilution line. In contrast, MW-31-060 and MW-25 exhibit a slightly heavier signature in 2019 relative to 2017.
- In some cases (MW-47-055, MW-33-090, MW-33-150, MW-39-080, and MW-36-100), δ18O values in 2019 rebounded back to their 2017 values without substantial change in δ2H over the same period, suggesting that the results may not be evidence of significant differences.
- Some non-plume wells, including fluvial wells MW-34-080, MW-34-055, MW-30-050, and MW-36-090, also exhibit a lower δ18O signature in 2019 relative to 2017, whereas others (e.g., MW-42-055,

MW-42-065, and MW-32-035) exhibit a higher δ18O signature in 2019. In each of these cases, the trend in δ2H signature does not strongly follow the δ18O trend, again suggesting that these results do not necessarily suggest significant dilution or mixing effects.

5.6 Projected River Levels During Next Quarter

Colorado River water level projections provide river level information that is useful for anticipating IM-3 extraction requirements for the upcoming quarter. The Colorado River stage near the site is measured at river monitoring location I-3. Water levels are 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 the largest monthly releases typically in spring and early summer and the 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 5-7 shows the river stage measured at location 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 2020 is based on the December 2019 USBR projections of Davis Dam release and Lake Havasu level. Future projections of Colorado River stage, shown on Figure 5-7, are based on USBR long-range projections of Davis Dam releases and Lake Havasu levels from December 2019. There is more uncertainty in these projections at longer times in the future because water demand is based on various factors, including climatic factors.

Current USBR projections, presented in Table 5-7, show that the projected Davis Dam release for January 2020 is 5,600 cubic feet per second, and the predicted Colorado River elevation at the I-3 gauge is 452.39 feet above mean sea level.

5.7 Fourth Quarter 2019 Performance Monitoring Program Evaluation Summary

A summary of the Fourth Quarter 2019 PMP evaluation is provided below.

- Cr(VI) isoconcentration maps indicate that Cr(VI) concentrations greater than 20 µg/L in the floodplain area are hydraulically controlled.
- IM extraction well TW-03D was primarily operated to support hydraulic control. A total of 11,271,753 gallons of groundwater were extracted by the IM-3 system, and an estimated 86.1 pounds (39.1 kilograms) of chromium were removed from groundwater.
- Cr(VI) and dissolved chromium concentrations in monitoring wells located within 800 feet of extraction well TW-03D were lower than their established notification levels, except at 10 wells. The DTSC was notified with results from the 10 wells and shutdown of extraction well PE-01 was continued through the end of Fourth Quarter 2019. The seasonal cycles of the Colorado River levels are associated with fluctuations in chromium concentrations, and the changes observed at these monitoring wells are consistent with past variations over the duration of GMP monitoring.

- Groundwater potentiometric surface maps and the gradient analysis from designated well pairs provide evidence of hydraulic containment of the Cr(VI) plume. The overall monthly average landward gradients in November and December 2019 were approximately 4.6 to 3.4 times the required minimum magnitude of 0.001 ft/ft, respectively.
- Cr(VI) and dissolved chromium concentrations in the IMCP monitoring wells were lower than their established trigger levels, indicating that chromium concentrations did not increase at areas of interest across the site.
- Isotopic results illustrate that several wells (including plume and non-plume wells) exhibit a lighter oxygen isotope signature in 2019 relative to 2018 and 2017; however, these decreases appear to be more significant in δ18O than δ2H. In addition, several wells also exhibited a rebound in δ18O between 2018 and 2019 back to 2017 values. Therefore, although the isotope trends may be a result of the continuous landward gradient created by IM pumping, which has caused mixing of plume groundwater with river-influenced groundwater, the observed trends for several of the wells may not be significant.

6 ANNUAL IM PERFORMANCE MONITORING PROGRAM EVALUATION

This section summarizes results of the Annual Reporting Period PMP evaluation.

6.1 Distribution of Hexavalent Chromium in the Floodplain

Appendix F provides Cr(VI) concentration time series charts for monitoring wells in the floodplain and includes Cr(VI) concentration time series charts for six deep monitoring wells in the floodplain area (MW-34-100, MW-36-090, MW-36-100, MW-44-115, MW-44-125, and MW-46-175) that have historically been monitored for chromium encroachment. These six wells are located between the IM extraction wells and the Colorado River and show the distribution of Cr(VI) concentrations at the toe of the Cr(VI) plume. As shown by the concentration time series charts, Cr(VI) concentrations have decreased since initiation of the IM extraction system in 2005 and have remained relatively steady over the past few years. During the Annual Reporting Period, Cr(VI) concentrations at the six wells were below 20 µg/L (Appendices E and F). In general, wells showing marked decreases in Cr(VI) concentration are generally located 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 Fourth Quarter 2019. Cr(VI) concentrations have remained steady or have decreased in many wells since IM pumping began in 2004 and 2005, respectively (Appendix F).

6.2 IM Extraction System Operation

During the Annual Reporting Period, IM extraction well TW-03D was primarily operated to support hydraulic control. The target pumping rate was 135 gpm. Extraction well PE-01 was only operated for brief periods to support IM-3 system maintenance and sampling. Extraction wells TW-02S and TW-02D were not operated except for a brief period during sampling at TW-02D. The IM-3 system extracted and treated 66,642,772 gallons of groundwater between January and December 2019, and an estimated 278 pounds (126 kilograms) of chromium were removed from the aquifer between January 1 and December 31, 2019 (Tables 5-1 and 6-1).

Extraction wells TW-03D and PE-01 (with mostly all the flow from TW-03D) operated at a combined average annual pumping rate of 126.8 gpm, including periods of planned and unplanned downtime. Figure 5-8 shows the average monthly pumping rates, cumulative groundwater volumes extracted, and the percentage of time during which the extraction system was in operation during the Annual Reporting Period. Pumping rates were relatively consistent from month to month, with IM-3 operating close to design capacity (Table 6-1).

Chromium Concentrations in Wells Monitored for Conditional Shutdown of PE-01

During the Annual Reporting Period, Cr(VI) and dissolved chromium concentrations in 35 out of 47 wells monitored were lower than the 2014 (or 2013 where appropriate) maximum concentrations (i.e., notification levels). Cr(VI) and/or dissolved chromium exceedances of the notification levels in 2019 included:

- First Quarter 2019: No exceedances

- Second Quarter 2019 (six monitoring wells): MW-26, MW-33-150, MW-39-100, MW-44-125, MW-47-055, and MW-47-115
- Third Quarter 2019: No exceedances
- Fourth Quarter 2019 10 monitoring wells): MW-20-070, MW-26, MW-27-020, MW-31-135, MW-33-210, MW-39-080, MW-39-100, MW-46-205, MW-47-055, and MW-47-115.

The DTSC was notified of the exceedances each quarter within 40 days after the end of the quarterly GMP sampling events. Extraction well PE-01 remained shut down throughout the Annual Reporting Period. Table 5-2 presents the Cr(VI) and dissolved chromium concentrations for subject wells during the Annual Reporting Period in comparison to the notification levels.

6.3 IM Hydraulic Monitoring Results

Hydraulic Gradient Evaluation: California Floodplain

During the Annual Reporting Period, hydraulic gradients were measured for three gradient well pairs selected for performance monitoring of the IM-3 system (shown on Figure 1-4; note that PE-01 was not operated for hydraulic control throughout Annual Reporting Period):

- Northern Gradient Pair: MW-31-135 and MW-33-150
- Central Gradient Pair: MW-20-130 and MW-34-100
- Southern Gradient Pair: MW-20-130 and MW-27-085.

Table 6-2 presents the average monthly hydraulic gradients measured for each of the gradient well pairs, as well as the overall monthly averages of all well pairs, during the Annual Reporting Period. Landward gradients measured each month exceeded the 0.001 ft/ft requirement. Groundwater potentiometric maps of shallow, mid-depth, and deep wells from First Quarter 2019 (Arcadis 2019a), Second Quarter 2019 (Arcadis 2019b), Third Quarter 2019 (Arcadis 2019c), and Fourth Quarter 2019 (Figures 5-3a, 5-3b, and 5-3c) show the landward hydraulic gradient maintained throughout the year. Figure 5-5 further illustrates the measured hydraulic gradients during the Annual Reporting Period with the concurrent Colorado River elevations and IM-3 pumping rates.

Hydraulic Gradient Evaluation: Arizona Side of the Colorado River

During the Annual Reporting Period, potentiometric levels in monitoring wells in Arizona were higher than those in wells across the river on the California floodplain (Arcadis 2019a, 2019b, and 2019c; Figures 5-3a, 5-3b, and 5-3c). As stated in Section 5.3, this indicates that the apparent hydraulic gradient on the Arizona side of the river is westward, which is consistent with the site conceptual model and the current numerical groundwater flow model.

6.4 IM Contingency Plan Monitoring Results

During the Annual Reporting Period, Cr(VI) concentrations in the 24 IMCP monitoring wells were lower than the established trigger levels (Table 5-5); therefore, implementation of the contingency plan was not needed.

Trigger levels are re-evaluated annually to determine if any changes need to be made. During the Annual Reporting Period, Cr(VI) concentrations in the 24 IMCP monitoring wells remained below their respective trigger levels, which were established in August 2006 and approved in July 2008 (CH2M Hill 2006; DTSC 2008c; the trigger level for MW-47-115 was updated and approved in June 2009). Wells with Cr(VI) concentrations greater than the IM performance standard of 20 µg/L show stable or decreasing trends; therefore, changes to trigger levels are not recommended at this time.

6.5 Annual Performance Monitoring Program Evaluation Summary

A summary of the Annual Reporting Period PMP evaluation is provided below.

- Cr(VI) isoconcentration maps from First Quarter, Second Quarter, Third Quarter, and Fourth Quarter 2019 indicated that Cr(VI) concentrations greater than 20 µg/L in the floodplain area were hydraulically controlled. Cr(VI) concentrations in the floodplain are generally stable or decreasing, with notable decreases observed where groundwater is being extracted.
- Throughout 2019, IM extraction well TW-03D was primarily operated to support hydraulic control. A total of 66,642,772 gallons of groundwater were extracted by the IM-3 system, and an estimated 278 pounds (126 kilograms) of chromium were removed from groundwater.
- Cr(VI) and dissolved chromium concentrations in monitoring wells located within 800 feet of extraction well TW-03D were lower than their established 2014 (or 2013 where appropriate) maximum concentrations, except at 12 wells. The DTSC was notified of the exceedances each quarter, and shutdown of extraction well PE-01 was allowed to continue through the end of the Annual Reporting Period. The seasonal cycles of Colorado River levels are associated with small fluctuations in chromium concentrations, and the changes observed at these monitoring wells are consistent with past variations during GMP monitoring.
- Groundwater potentiometric surface maps and the gradient analysis from designated well pairs throughout 2019 provide evidence of hydraulic containment of the Cr(VI) plume. The overall monthly average landward gradients throughout the Annual Reporting Period met the required minimum gradient of 0.001 ft/ft. The average monthly IM pumping rates, ranging between 110.5 and 134.2 gpm (Table 6-1), were sufficient to meet this requirement and maintain hydraulic control of the Cr(VI) plume.
- Each quarter, Cr(VI) concentrations in the IMCP monitoring wells were lower than their established trigger levels, indicating that chromium concentrations did not increase at areas of interest across the site.

7 UPCOMING OPERATION AND MONITORING EVENTS

GMP, RMP, and PMP monitoring activities will continue under direction from the DTSC in First Quarter 2020. Monitoring activities and results will be reported in the First Quarter 2020 PMP-GMP Report (planned for submittal by April 30, 2020).

7.1 Groundwater Monitoring Program

7.1.1 Monthly Groundwater Monitoring

Monthly GMP monitoring events are planned for January, February, and March 2020 at extraction wells PE-01 and TW-03D.

7.1.2 Quarterly Groundwater Sampling

The quarterly GMP monitoring event is planned for February 2020. This event will consist of groundwater sampling and inspection of 20 monitoring wells. Any necessary corrective actions to monitoring wells will be performed in a timely manner.

If rainfall events occur in First Quarter 2020 that cause surface water flow in Bat Cave Wash, monitoring wells MW-09, MW-10, and MW-11 will be sampled.

7.1.3 Sampling Method Trials at Select Wells

Sampling method trials are proposed to continue at monitoring well MW-60BR-245, as noted in Section 4.1.3. Groundwater samples will be collected using the 3V method first followed by the low-flow method. The next sampling method trial for this well is planned for First Quarter 2020 (during the quarterly GMP monitoring event).

7.2 Surface Water Monitoring Program

Two surface water monitoring events will be performed in First Quarter 2020. The first event is planned for January 2020 during low-flow conditions, and the second event is planned for February 2020. Both events will consist of surface water sampling at 16 locations.

7.3 IM Performance Monitoring Program

7.3.1 Chromium Monitoring

Chromium monitoring will be performed as part of the First Quarter 2020 GMP monthly and quarterly monitoring events. Cr(VI) data will be collected from a total of 22 monitoring wells.

7.3.2 IM Extraction System Operation

During First Quarter 2020, the IM-3 system will continue operating and operations will be documented. IM extraction wells TW-03D and PE-01 (as needed) will be pumped with a target rate of 135 gpm, except

during periods of planned and unplanned downtime, to maintain appropriate hydraulic gradients across the Alluvial Aquifer. Extraction will be primarily from TW-03D, coupled with PE-01 only if needed 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 TW-03D and achieve total flow.

First Quarter 2020 GMP monitoring results from wells listed in the July 20, 2015 DTSC approval letter for conditional PE-01 shutdown (DTSC 2015) will be compared to the 2014 (or 2013 for wells sampled biennially) maximum Cr(VI) and dissolved chromium concentrations. Results that exceed the 2014/2013 maximum concentrations will be reported to the DTSC within 40 days after the end of the quarterly GMP sampling event.

7.3.3 IM Hydraulic Monitoring

The IM hydraulic monitoring network will continue to be used to demonstrate compliance of the required 0.001 ft/ft landward hydraulic gradient. During the first two weeks of each month, pressure transducers will be downloaded from the 52 monitoring wells in the IM hydraulic monitoring network, five wells located on the Arizona side of the Colorado River, and two river monitoring locations. Pressure transducers at the six gradient control wells (MW-27-085, MW-31-135, MW-33-150, MW-34-100, MW-45-095, and MW-20-130) will continue to be downloaded via cellular telemetry at monthly or more frequent intervals, as needed, to verify that 0.001 ft/ft landward gradients are maintained.

7.3.4 IM Contingency Plan Monitoring

First Quarter 2020 GMP monitoring results from IMCP wells will be compared to their respective trigger levels. If any exceedances are observed, the DTSC will be notified in accordance with the Revised Contingency Plan Flow Chart (PG&E 2008).

7.4 Quarterly Notifications

Email notifications will be sent in First Quarter 2020 providing Cr(VI) and dissolved chromium results for shoreline and in-channel surface water monitoring locations and monitoring wells MW-34-100, MW-44-115, MW-46-175, and MW-44-125.

7.5 Monitoring Well Installation

In accordance with the Basis of Design Report (CH2M Hill 2015), new monitoring wells, extraction wells, and injection wells are currently being installed as part of the final groundwater remedy at the site. A summary of field activities and monitoring results associated with the installation of the new wells will be reported under separate cover as part of the monthly reporting process associated with construction of the final groundwater remedy.

8 REFERENCES

Arcadis. 2019a. First Quarter 2019 Interim Measures Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California. April 30.

Arcadis. 2019b. Second Quarter 2019 Interim Measures Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California. August 15.

Arcadis. 2019c. Third Quarter 2019 Interim Measures Performance Monitoring and Site-Wide Groundwater and Surface Water Monitoring Report, PG&E Topock Compressor Station, Needles, California. December 15.

CH2M Hill. 2005. Monitoring Plan for Groundwater and Surface Water Monitoring Program. PG&E Topock Compressor Station, Needles, California. April 11.

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

CH2M Hill. 2007. RCRA Facility Investigation/Remedial Investigation Report, Volume 1 – Site Background and History. PG&E Topock Compressor Station, Needles, California. August.

CH2M. 2009a. Revised Final RCRA Facility Investigation/Remedial Investigation Report. Volume 2 – Hydrogeologic Characterization and Results of Groundwater and Surface Water Investigation. PG&E Topock Compressor Station, Needles, California. February 11.

CH2M Hill. 2009b. Groundwater Background Study, Steps 3 and 4: Revised Final Report of Results, PG&E Topock Compressor Station, Needles, California. November 6.

CH2M Hill. 2015. Basis of Design Report/Final [100%] Design Submittal for the Final Groundwater Remedy. November.

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

DTSC. 2007. Letter to PG&E. Approval of Updates and Modifications to the Interim Measures Performance Monitoring Program. PG&E Topock Compressor Station. October 12.

DTSC. 2008a. Letter to PG&E. Modifications to Hydraulic Data Collection for the Interim Measures Performance Monitoring Program at PG&E Topock Compressor Station, Needles, California. July 14.

DTSC. 2008b. Letter to Geology and Remediation Engineering. Updates to the Interim Measures Chemical Performance Monitoring Program. PG&E Topock Compressor Station, Needles, California. July 16.

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

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

DTSC. 2010a. Email. Re: Topock GMP Monitoring Frequency Modification. March 3.

DTSC. 2010b. Letter to PG&E. Arizona Monitoring Well Sampling Frequency Modification. PG&E Topock Compressor Station, Needles, California. April 28.

DTSC. 2014. 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 PG&E Topock Compressor Station, Needles, California (USEPA ID No. CAT080011729). July 0.

DTSC. 2017a. Memorandum from Chris Guerre/DTSC to Aaron Yue/DTSC Proposal for Alternative Groundwater Sampling Trial. PG&E Topock Compressor Station Site, Needles, California. April 6.

DTSC. 2017b. Email from Chris Guerre/DTSC to Jay Piper/CH2M and Curt Russell/PG&E. Re: PG&E Topock – Letter Requesting Modified Key Gradient Well Pairs When PE-01 Is Not Pumping. August 18.

DTSC. 2017c. Memorandum from Chris Guerre/DTSC to Aaron Yue/DTSC. Response to Comments on Proposal for Alternative Groundwater Sampling Trial. PG&E Topock Compressor Station Site, Needles, California. October 20.

DTSC. 2018. PG&E Topock Compressor Station: Environmental Investigation and Cleanup Activities. Web page. Located at: http://dtsc-topock.com/.

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 2019 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report

PG&E Topock Compressor Station, Needles, California

Period	Reporting Period	Report Submittal Date	Anticipated Number of Monitoring Locations: Groundwater Monitoring Program (GMP)	Anticipated Number of Monitoring Locations: Surface Water Monitoring Program (RMP)	Anticipated Number of Monitoring Locations: Chromium Monitoring*	Anticipated Number of Monitoring Locations: Monitoring for Conditional Shutdown of PE-01*	Anticipated Number of Monitoring Locations: IM Hydraulic Monitoring	Anticipated Number of Monitoring Locations: IM Contingency Plan Monitoring*	Anticipated Number of Monitoring Locations: IM Chemical Performance Monitoring
First Quarter	January - March	April 30	22	16	22	4	59	3	0
Second Quarter	April - June	August 15	105	16	105	30	59	19	0
Third Quarter	July - October	December 15	22	16	22	4	59	3	0
Fourth Quarter	November - December	March 15	143 annual + 2 biennial	16	143 annual + 2 biennial	47	59	24	10 annual + 1 biennial

Notes:

1. On July 23, 2010, DTSC approved a revised reporting schedule that included a revised IM-3 monitoring period (i.e., chromium removed), as follows:
   First Quarter: January - February
   Second Quarter: March - May
   Third Quarter: June - September
   Fourth Quarter: October - December

* = Monitoring consists of collecting hexavalent chromium and/or dissolved chromium data from groundwater monitoring wells; these data are collected during the GMP monitoring event.

GMP = Groundwater Monitoring Program.

DTSC = Department of Toxic Substance Control.

IM = interim measure.

RMP = Surface Water Monitoring Program.

Table 1-2
GMP, RMP, and PMP Monitoring Summary
Fourth Quarter 2019 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report
PG&E Topock Compressor Station, Needles, California

Location ID	Site Area	Measuring Point Elevation (ft amsl)	Well Screen Interval (ft bgs)	Well Screen Lithology	Well Casing Diameter (inches)	Well Depth (ft bgs)	Aquifer Zone	Sampling Method	GMP Monitoring Frequency	RMP Monitoring Frequency	PMP Monitoring: Chromium Monitoring Frequency	PMP Monitoring: Monitoring Frequency for Conditional Shutdown of PE-01	PMP Monitoring: IM Hydraulic Monitoring Frequency	PMP Monitoring: IM Contingency Plan Monitoring Frequency	PMP Monitoring: IM Chemical Performance Monitoring Frequency	Notes
MW-09	Bat Cave Wash	536.56	77 - 87	Alluvial	4 in PVC	89.4	Shallow	LF	Semiannual	--	Semiannual	--	--	--	--	Bat Cave Wash flow
MW-10	Bat Cave Wash	530.65	74 - 94	Alluvial	4 in PVC	96.9	Shallow	LF	Semiannual	--	Semiannual	--	--	--	--	Bat Cave Wash flow
MW-11	Bat Cave Wash	522.54	62.5 - 82.5	Alluvial	4 in PVC	86.1	Shallow	LF	Semiannual	--	Semiannual	--	--	--	--	Bat Cave Wash flow
MW-12	East of Station	484.01	27.5 - 47.5	Alluvial	4 in PVC	50.4	Shallow	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-13	Bat Cave Wash	488.64	28.5 - 48.5	Alluvial	4 in PVC	52.0	Shallow	LF	Annual	--	Annual	--	--	--	--	
MW-14	East Mesa	570.99	111 - 131	Alluvial	4 in PVC	133.8	Shallow	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-15	East of New Ponds	641.52	180.5 - 200.5	Alluvial	4 in PVC	203.0	Shallow	LF	Annual	--	Annual	--	--	--	--	
MW-16	Near New Ponds	657.31	198 - 218	Alluvial	4 in PVC	218.1	Shallow	LF	Biennial	--	Biennial	--	--	--	--	
MW-17	West of Mesa Area	589.96	130 - 150	Alluvial	4 in PVC	153.6	Shallow	LF	Biennial	--	Biennial	--	--	--	--	
MW-18	West Mesa	545.32	85 - 105	Alluvial	4 in PVC	106.7	Shallow	LF	Annual	--	Annual	--	--	--	--	
MW-19	Route 66	499.92	46 - 66	Alluvial	4 in PVC	65.8	Shallow	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-20-070	MW-20 bench	500.07	50 - 70	Alluvial	4 in PVC	69.6	Shallow	LF	Semiannual	--	Semiannual	Semiannual	Monthly	--	Annual	
MW-20-100	MW-20 bench	500.58	89.5 - 99.5	Alluvial	4 in PVC	101.4	Middle	LF	Semiannual	--	Semiannual	Semiannual	Monthly	--	Annual	
MW-20-130	MW-20 bench	500.66	121 - 131	Alluvial	4 in PVC	132.3	Deep	LF	Semiannual	--	Semiannual	Semiannual	Monthly	--	Annual	Hydraulic Gradient Well
MW-21	Route 66	505.55	39 - 59	Alluvial	4 in PVC	58.5	Shallow	LF	Semiannual	--	Semiannual	--	--	Semiannual	--	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	Shallow	LF	Semiannual	--	Semiannual	--	Monthly	--	--	
MW-23-060	East Ravine	504.08	50 - 60	Bedrock	2 in Sch 40 PVC	60.2	Bedrock	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-23-080	East Ravine	504.13	75 - 80	Bedrock	2 in Sch 40 PVC	80.8	Bedrock	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-24A	MW-24 Bench	567.16	104 - 124	Alluvial	4 in PVC	127.5	Shallow	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-24B	MW-24 Bench	564.76	193 - 213	Alluvial	4 in PVC	214.8	Deep	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-24BR	MW-24 Bench	563.95	378 - 437	Bedrock	4 in PVC	441.0	Bedrock	3V	Annual	--	Annual	--	--	--	--	Low recharge well; typically purges dry at 1 casing volume
MW-25	Near Bat Cave Wash	542.90	84.5 - 104.5	Alluvial	4 in PVC	106.5	Shallow	LF	Semiannual	--	Semiannual	--	Monthly	--	Annual	
MW-26	Route 66	502.22	51.5 - 71.5	Alluvial	2 in PVC	70.1	Shallow	LF	Semiannual	--	Semiannual	Semiannual	Monthly	--	Biennial	
MW-27-020	Floodplain	460.56	7 - 17	Fluvial	2 in PVC	14.4	Shallow	LF	Annual	--	Annual	Annual	Monthly	--	--	
MW-27-060	Floodplain	461.49	47.3 - 57.3	Fluvial	2 in PVC	59.0	Middle	LF	Annual	--	Annual	Annual	Monthly	--	--	
MW-27-085	Floodplain	460.99	77.5 - 87.5	Fluvial	2 in PVC	80.0	Deep	LF	Semiannual	--	Semiannual	Semiannual	Monthly	Semiannual	--	Hydraulic Gradient Well
MW-28-025	Floodplain	466.77	13 - 23	Fluvial	2 in PVC	21.1	Shallow	LF	Semiannual	--	Semiannual	Semiannual	Monthly	--	--	
MW-28-090	Floodplain	467.53	70 - 90	Fluvial	2 in PVC	98.4	Deep	LF	Semiannual	--	Semiannual	Semiannual	Monthly	Semiannual	--	
MW-29	Floodplain	485.21	29.5 - 39.5	Fluvial	2 in PVC	41.5	Shallow	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-30-030	Floodplain	468.12	12 - 32	Fluvial	2 in PVC	26.9	Shallow	LF	Annual	--	Annual	Annual	--	--	--	
MW-30-050	Floodplain	468.81	40 - 50	Fluvial	4 in PVC	52.6	Middle	LF	Annual	--	Annual	Annual	Monthly	--	--	
MW-31-060	MW-20 Bench	496.81	41.5 - 61.5	Alluvial	4 in PVC	64.0	Shallow	LF	Semiannual	--	Semiannual	Semiannual	Monthly	--	Annual	
MW-31-135	MW-20 Bench	498.11	113 - 133	Alluvial	2 in PVC	135.4	Deep	LF	Annual	--	Annual	Annual	Monthly	--	--	Hydraulic Gradient Well
MW-32-020	Floodplain	461.51	10 - 20	Fluvial	2 in PVC	19.6	Shallow	LF	Annual	--	Annual	Annual	--	Annual	--	
MW-32-035	Floodplain	461.63	27.5 - 35	Fluvial	4 in PVC	37.2	Shallow	LF	Semiannual	--	Semiannual	Semiannual	Monthly	Semiannual	Annual	
MW-33-040	Floodplain	487.38	29 - 39	Fluvial	2 in PVC	41.8	Shallow	LF	Semiannual	--	Semiannual	Semiannual	Monthly	Semiannual	--	
MW-33-090	Floodplain	487.55	69 - 89	Alluvial	4 in PVC	88.3	Middle	LF	Semiannual	--	Semiannual	Semiannual	Monthly	Semiannual	--	
MW-33-150	Floodplain	487.77	132 - 152	Alluvial	2 in PVC	155.4	Deep	LF	Semiannual	--	Semiannual	Semiannual	Monthly	Semiannual	--	Hydraulic Gradient Well
MW-33-210	Floodplain	487.25	190 - 210	Alluvial	2 in PVC	223.0	Deep	LF	Semiannual	--	Semiannual	Semiannual	--	Semiannual	--	
MW-34-055	Floodplain	460.95	45 - 55	Fluvial	4 in PVC	56.6	Middle	LF	Annual	--	Annual	Annual	Monthly	--	Annual	
MW-34-080	Floodplain	461.20	73 - 83	Fluvial	4 in PVC	84.3	Deep	LF	Semiannual	--	Semiannual	Semiannual	Monthly	Semiannual	Annual	
MW-34-100	Floodplain	460.97	89.5 - 99.5	Fluvial	2 in PVC	117.0	Deep	LF	Quarterly	--	Quarterly	Quarterly	Monthly	Quarterly	Annual	Hydraulic Gradient Well
MW-35-060	Route 66	484.33	41 - 61	Alluvial	2 in PVC	56.8	Shallow	LF	Semiannual	--	Semiannual	--	Monthly	--	--	
MW-35-135	Route 66	484.24	116 - 136	Alluvial	2 in PVC	158.7	Deep	LF	Semiannual	--	Semiannual	--	Monthly	--	--	
MW-36-020	Floodplain	469.33	10 - 20	Fluvial	1 in PVC	20.3	Shallow	LF	Annual	--	Annual	Annual	Monthly	--	--	
MW-36-040	Floodplain	469.59	30 - 40	Fluvial	1 in PVC	40.3	Shallow	LF	Annual	--	Annual	Annual	Monthly	--	--	
MW-36-050	Floodplain	469.62	46 - 51	Fluvial	1 in PVC	108.0	Middle	LF	Annual	--	Annual	Annual	Monthly	--	--	
MW-36-070	Floodplain	469.27	60 - 70	Fluvial	1 in PVC	70.3	Middle	LF	Annual	--	Annual	Annual	Monthly	Annual	--	
MW-36-090	Floodplain	469.64	80 - 90	Fluvial	1 in PVC	90.3	Deep	LF	Semiannual	--	Semiannual	Semiannual	Monthly	--	--	
MW-36-100	Floodplain	469.65	88 - 98	Fluvial	2 in PVC	108.0	Deep	LF	Semiannual	--	Semiannual	Semiannual	Monthly	--	--	
MW-37D	Bat Cave Wash	486.19	180 - 200	Alluvial	2 in PVC	226.7	Deep	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-37S	Bat Cave Wash	485.97	64 - 84	Alluvial	2 in PVC	85.0	Middle	LF	Annual	--	Annual	--	--	--	--	
MW-38D	Bat Cave Wash	525.31	163 - 183	Alluvial	2 in PVC	190.9	Deep	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-38S	Bat Cave Wash	526.59	75 - 95	Alluvial	2 in PVC	98.1	Shallow	LF	Quarterly	--	Quarterly	--	--	--	--	
MW-39-040	Floodplain	468.02	30 - 40	Fluvial	1 in PVC	42.1	Shallow	LF	Annual	--	Annual	Annual	Monthly	Annual	--	
MW-39-050	Floodplain	467.93	47 - 52	Fluvial	1 in PVC	54.6	Middle	LF	Annual	--	Annual	Annual	Monthly	--	--	
MW-39-060	Floodplain	468.00	49 - 59	Alluvial	1 in PVC	15.2	Middle	LF	Annual	--	Annual	Annual	Monthly	--	--	
MW-39-070	Floodplain	468.02	60 - 70	Alluvial	1 in PVC	71.7	Middle	LF	Annual	--	Annual	Annual	Monthly	--	--	
MW-39-080	Floodplain	467.92	70 - 80	Alluvial	1 in PVC	82.6	Deep	LF	Annual	--	Annual	Annual	Monthly	--	--	
MW-39-100	Floodplain	468.12	80 - 100	Alluvial	2 in PVC	117.7	Deep	LF	Semiannual	--	Semiannual	Semiannual	Monthly	--	--	
MW-40D	I-40 Median	566.08	240 - 260	Alluvial	2 in PVC	266.0	Deep	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-40S	I-40 Median	566.04	115 - 135	Alluvial	2 in PVC	134.0	Shallow	H	Semiannual	--	Semiannual	--	--	--	--	

Table 1-2
GMP, RMP, and PMP Monitoring Summary
Fourth Quarter 2019 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report
PG&E Topock Compressor Station, Needles, California

Location ID	Site Area	Measuring Point Elevation (ft amsl)	Well Screen Interval (ft bgs)	Well Screen Lithology	Well Casing Diameter (inches)	Well Depth (ft bgs)	Aquifer Zone	Sampling Method	GMP Monitoring Frequency	RMP Monitoring Frequency	PMP Monitoring: Chromium Monitoring Frequency	PMP Monitoring: Monitoring Frequency for Conditional Shutdown of PE-01	PMP Monitoring: IM Hydraulic Monitoring Frequency	PMP Monitoring: IM Contingency Plan Monitoring Frequency	PMP Monitoring: IM Chemical Performance Monitoring Frequency	Notes
MW-41D	Bat Cave Wash	479.42	271 - 291	Alluvial	2 in PVC	311.5	Deep	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-41M	Bat Cave Wash	479.84	170 - 190	Alluvial	2 in PVC	190.0	Deep	LF	Annual	--	Annual	--	--	--	--	
MW-41S	Bat Cave Wash	480.07	40 - 60	Alluvial	2 in PVC	60.0	Shallow	LF	Annual	--	Annual	--	--	--	--	
MW-42-030	Floodplain	463.74	9.8 - 29.8	Fluvial	2 in Sch 40 PVC	30.1	Shallow	LF	Annual	--	Annual	Annual	Monthly	--	--	
MW-42-055	Floodplain	463.85	42.5 - 52.5	Fluvial	2 in PVC	52.8	Middle	LF	Semiannual	--	Semiannual	Semiannual	--	Semiannual	--	
MW-42-065	Floodplain	463.37	56.2 - 66.2	Fluvial	2 in PVC	80.0	Middle	LF	Semiannual	--	Semiannual	Semiannual	Monthly	Semiannual	--	
MW-43-025	Floodplain	462.54	15 - 25	Fluvial	2 in PVC	25.0	Shallow	LF	Annual	--	Annual	--	Monthly	--	--	
MW-43-075	Floodplain	462.71	65 - 75	Fluvial	2 in PVC	75.0	Deep	LF	Annual	--	Annual	--	--	Annual	--	
MW-43-090	Floodplain	462.76	80 - 90	Fluvial	2 in PVC	97.0	Deep	LF	Annual	--	Annual	--	Monthly	Annual	--	
MW-44-070	Floodplain	471.84	61 - 71	Fluvial	2 in PVC	70.0	Middle	LF	Semiannual	--	Semiannual	Semiannual	Monthly	Semiannual	--	
MW-44-115	Floodplain	471.94	105 - 115	Alluvial	2 in PVC	113.5	Deep	LF	Quarterly	--	Quarterly	Quarterly	Monthly	Quarterly	--	
MW-44-125	Floodplain	472.11	116 - 125	Alluvial	2 in PVC	128.8	Deep	LF	Semiannual	--	Semiannual	Semiannual	Monthly	Semiannual	--	
MW-45-095a	Floodplain	468.27	83 - 93	Fluvial	2 in PVC	97.0	Deep	--	--	--	--	X (see Note 1)	Monthly	--	--	Pressure transducer location; Hydraulic Gradient Well
MW-46-175	Floodplain	482.16	165 - 175	Alluvial	2 in PVC	175.5	Deep	LF	Quarterly	--	Quarterly	Quarterly	Monthly	Quarterly	--	
MW-46-205	Floodplain	482.23	196.5 - 206.5	Alluvial	2 in PVC	206.5	Deep	LF	Semiannual	--	Semiannual	Semiannual	--	Semiannual	--	
MW-47-055	Floodplain	484.04	45 - 55	Alluvial	2 in PVC	55.0	Shallow	LF	Semiannual	--	Semiannual	Semiannual	Monthly	Semiannual	--	
MW-47-115	Floodplain	484.17	105 - 115	Alluvial	2 in PVC	115.0	Deep	LF	Semiannual	--	Semiannual	Semiannual	Monthly	Semiannual	--	
MW-48	East of Station	486.22	124 - 134	Bedrock	2 in PVC	138.0	Bedrock	LF	Semiannual	--	Semiannual	--	--	--	--	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	Deep	LF	Annual	--	Annual	--	Monthly	--	--	
MW-49-275	Floodplain	483.95	255 - 275	Alluvial	2 in PVC	274.7	Deep	LF	Annual	--	Annual	--	--	--	--	
MW-49-365	Floodplain	484.01	346 - 366	Alluvial	2 in PVC	367.4	Deep	LF	Annual	--	Annual	--	--	--	--	
MW-50-095	Route 66	496.49	85 - 95	Alluvial	2 in PVC	95.0	Middle	LF	Semiannual	--	Semiannual	--	Monthly	--	--	
MW-50-200	Route 66	496.35	190 - 200	Alluvial	2 in PVC	204.5	Deep	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-51	Route 66	501.56	97 - 112	Alluvial	4 in PVC	113.3	Middle	LF	Semiannual	--	Semiannual	Semiannual	Monthly	--	--	
MW-52D	Floodplain	462.16	85 - 87	Fluvial	0.75 in MLABS	89.5	Deep	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-52M	Floodplain	462.16	66 - 68	Fluvial	0.75 in MLABS	70.5	Deep	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-52S	Floodplain	462.16	47 - 49	Fluvial	0.75 in MLABS	51.5	Middle	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-53D	Floodplain	461.32	123.5 - 125	Fluvial	0.75 in MLABS	---	Deep	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-53M	Floodplain	461.32	98.5 - 100	Fluvial	0.75 in MLABS	---	Deep	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-54-085	Arizona	466.10	77 - 87	Fluvial	2 in PVC	93.2	Deep	LF	Semiannual	--	Semiannual	--	Monthly	--	--	
MW-54-140	Arizona	465.98	128 - 138	Fluvial	2 in PVC	138.0	Deep	LF	Semiannual	--	Semiannual	--	Monthly	--	--	
MW-54-195	Arizona	466.32	185 - 195	Fluvial	2 in PVC	195.0	Deep	LF	Semiannual	--	Semiannual	--	Monthly	--	--	
MW-55-045	Arizona	465.84	37 - 47	Fluvial	2 in PVC	54.0	Middle	LF	Semiannual	--	Semiannual	--	Monthly	--	--	
MW-55-120	Arizona	465.82	108 - 118	Fluvial	2 in PVC	120.3	Deep	LF	Semiannual	--	Semiannual	--	Monthly	--	--	
MW-56D	Arizona	461.36	103.5 - 105.5	Fluvial	0.75 in MLABS	---	Deep	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-56M	Arizona	461.36	73.5 - 75.5	Fluvial	0.75 in MLABS	---	Deep	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-56S	Arizona	461.36	33.5 - 35.5	Fluvial	0.75 in MLABS	---	Shallow	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-57-050	East Ravine	508.76	40 - 50	Bedrock	2 in Sch 40 PVC	50.0	Bedrock	LF	Quarterly	--	Quarterly	--	--	--	--	
MW-57-070	East Ravine	509.37	55 - 70	Bedrock	2 in Sch 40 PVC	70.0	Bedrock	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-57-185	East Ravine	508.97	70 - 184	Bedrock	4 in Sch 40 PVC	184.7	Bedrock	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-58-065	East Ravine	523.26	54 - 64	Bedrock	2 in Sch 40 PVC	66.0	Bedrock	LF	Quarterly	--	Quarterly	--	--	--	--	
MW-58BR	East Ravine	---	--	Bedrock	---	---	Bedrock	LF	Quarterly	--	Quarterly	--	--	--	--	
MW-59-100	East Ravine	541.61	86 - 101	Alluvial	2 in Sch 40 PVC	101.0	Shallow	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-60-125	East Ravine	555.47	103 - 123	Bedrock	2 in Sch 40 PVC	122.5	Bedrock	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-60BR-245	East Ravine	554.95	136 - 245	Bedrock	5 in	244.1	Bedrock	LF, 3V	Quarterly	--	Quarterly	--	--	--	--	Sampling Method Trial
MW-61-110	East Ravine	544.03	92 - 112	Bedrock	2 in Sch 40 PVC	112.5	Bedrock	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-62-065	East Ravine	503.56	44.5 - 64.5	Bedrock	2 in Sch 40 PVC	67.4	Bedrock	LF	Quarterly	--	Quarterly	--	--	--	--	
MW-62-110	East Ravine	504.05	85 - 110	Bedrock	---	110.0	Bedrock	G	Quarterly	--	Quarterly	--	--	--	--	
MW-62-190	East Ravine	504.05	155 - 192	Bedrock	---	190.0	Bedrock	3V	Semiannual	--	Semiannual	--	--	--	--	
MW-63-065	East Ravine	504.47	46 - 66	Bedrock	2 in Sch 40 PVC	65.6	Bedrock	LF	Quarterly	--	Quarterly	--	--	--	--	
MW-64BR	East Ravine	575.60	2 - 258	Bedrock	3 in	260.0	Bedrock	LF	Quarterly	--	Quarterly	--	--	--	--	
MW-65-160	Topock Compressor Station	596.59	150 - 160	Alluvial	2 in PVC	160.1	Shallow	LF	Quarterly	--	Quarterly	--	--	--	--	
MW-65-225	Topock Compressor Station	596.58	215 - 225	Alluvial	2 in PVC	225.1	Deep	LF	Quarterly	--	Quarterly	--	--	--	--	
MW-66-165	Topock Compressor Station	586.16	142 - 162	Alluvial	2 in PVC	162.1	Shallow	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-66-230	Topock Compressor Station	586.22	218 - 228	Alluvial	2 in PVC	228.1	Deep	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-66BR-270	Topock Compressor Station	586.15	248 - 271	Bedrock	5 in	270.6	Bedrock	3V	Semiannual	--	Semiannual	--	--	--	--	
MW-67-185	Topock Compressor Station	625.91	177 - 187	Alluvial	2 in	186.7	Shallow	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-67-225	Topock Compressor Station	625.83	210 - 225	Alluvial	2 in PVC	225.0	Middle	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-67-260	Topock Compressor Station	625.81	250 - 260	Alluvial	2 in PVC	260.0	Deep	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-68-180	Topock Compressor Station	621.17	165 - 180	Alluvial	2 in PVC	180.1	Shallow	LF	Quarterly	--	Quarterly	--	--	--	--	
MW-68-240	Topock Compressor Station	621.17	220 - 240	Alluvial	2 in PVC	240.1	Deep	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-68BR-280	Topock Compressor Station	620.64	257 - 279	Bedrock	5 in	278.2	Bedrock	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-69-195	Topock Compressor Station	631.36	176 - 196	Bedrock	2 in	195.5	Bedrock	LF	Quarterly	--	Quarterly	--	--	--	--	

Table 1-2
GMP, RMP, and PMP Monitoring Summary
Fourth Quarter 2019 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report
PG&E Topock Compressor Station, Needles, California

Location ID	Site Area	Measuring Point Elevation (ft amsl)	Well Screen Interval (ft bgs)	Well Screen Lithology	Well Casing Diameter (inches)	Well Depth (ft bgs)	Aquifer Zone	Sampling Method	GMP Monitoring Frequency	RMP Monitoring Frequency	PMP Monitoring: Chromium Monitoring Frequency	PMP Monitoring: Monitoring Frequency for Conditional Shutdown of PE-01	PMP Monitoring: IM Hydraulic Monitoring Frequency	PMP Monitoring: IM Contingency Plan Monitoring Frequency	PMP Monitoring: IM Chemical Performance Monitoring Frequency	Notes
MW-70-105	East Ravine	541.47	85 - 105	Bedrock	2 in PVC	107.8	Bedrock	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-70BR-225	East Ravine	539.84	120 - 227	Bedrock	5 in	229.3	Bedrock	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-71-035	East Ravine	483.69	26 - 36	Alluvial	2 in	36.2	Shallow	LF	Semiannual	--	Semiannual	--	--	--	--	
MW-72-080	East Ravine	513.32	60 - 80	Bedrock	2 in	80.1	Bedrock	LF	Quarterly	--	Quarterly	--	--	--	--	
MW-72BR-200	East Ravine	513.79	107 - 200	Bedrock	---	200.0	Bedrock	LF	Quarterly	--	Quarterly	--	--	--	--	
MW-73-080	East Ravine	505.84	60.2 - 80.2	Bedrock	2 in	79.9	Bedrock	LF	Quarterly	--	Quarterly	--	--	--	--	
MW-74-240	East Ravine	672.34	220 - 240	Bedrock	2 in	239.7	Bedrock	LF	Semiannual	--	Semiannual	--	--	--	--	
OW-03D	West Mesa	558.63	242 - 262	Alluvial	2 in Sch 40 PVC	272.5	Deep	LF	Annual	--	Annual	--	--	--	--	
OW-03M	West Mesa	558.9	180 - 200	Alluvial	2 in Sch 40 PVC	200.3	Middle	LF	Annual	--	Annual	--	--	--	--	
OW-03S	West Mesa	558.58	86 - 116	Alluvial	2 in Sch 40 PVC	116.3	Shallow	LF	Annual	--	Annual	--	--	--	--	
PGE-07BR	MW-24 Bench	--	249 - 300	Bedrock	7 in	300.0	Bedrock	3V	Annual	--	Annual	--	--	--	--	Inactive supply well
PGE-8	Station	596.01	405-554	Bedrock	6.75 in Steel	564.0	Bedrock	3V	Annual	--	Annual	--	--	--	--	Inactive injection well
PT-2D	Floodplain	--	95 - 105	Alluvial	2 in in PVC	105	Deep	--	--	--	--	--	Monthly	--	--	
PT-5D	Floodplain	--	95 - 105	Alluvial	2 in in PVC	105	Deep	--	--	--	--	--	Monthly	--	--	
PT-6D	Floodplain	--	95 - 105	Alluvial	2 in in PVC	105	Deep	--	--	--	--	--	Monthly	--	--	
PE-01	Floodplain	457.52	79 - 89	Fluvial	6 in Sch 40	99.0	Deep	tap	Monthly	--	Monthly	Monthly	--	--	--	IM extraction well
TW-01	Plan B Test	620.55	169 - 269	Alluvial	5 in PVC	271.0	Shallow	LF	Semiannual	--	Semiannual	--	--	--	--	Inactive pilot test well
TW-02D	MW-20 bench	493.29	113 - 148	Alluvial	6 in Sch 80 PVC	150.0	Deep	tap	Quarterly	--	Quarterly	--	--	--	--	IM extraction well
TW-02S	MW-20 bench	499.05	42.5 - 92.5	Alluvial	6 in Sch 80 PVC	97.5	Shallow	tap	Annual	--	Annual	--	--	--	--	IM extraction well
TW-03D	MW-20 bench	498.09	111 - 156	Alluvial	8 in PVC	156.0	Deep	tap	Monthly	--	Monthly	--	--	--	--	IM extraction well
TW-04	Floodplain	484.11	210 - 250	Alluvial	4 in PVC	255.0	Deep	LF	Semiannual	--	Semiannual	Semiannual	--	--	--	
TW-05	Route 66	496.30	110 - 150	Alluvial	4 in PVC	155.0	Deep	LF	Semiannual	--	Semiannual	--	--	--	--	
Park Moabi-3	Park Moabi	518.55	80 - 200	Alluvial	8 in Steel	252.0	Middle	tap	Annual	--	Annual	--	--	--	--	Active supply well
Park Moabi-4	Park Moabi	---	93 - 140	Alluvial	Steel	---	Middle	tap	Annual	--	Annual	--	--	--	--	Active supply well
C-BNS	In-Channel	--	--	--	--	--	--		--	Quarterly	--	--	--	--	--	
C-CON	In-Channel	--	--	--	--	--	--		--	Quarterly	--	--	--	--	--	Deep and shallow depth intervals
C-I-3 (I-3)	In-Channel	--	--	--	--	--	--		--	Quarterly	--	--	Monthly	--	--	Deep and shallow depth intervals
C-MAR	In-Channel	--	--	--	--	--	--		--	Quarterly	--	--	--	--	--	Deep and shallow depth intervals
C-NR1	In-Channel	--	--	--	--	--	--		--	Quarterly	--	--	--	--	--	Deep and shallow depth intervals
C-NR3	In-Channel	--	--	--	--	--	--		--	Quarterly	--	--	--	--	--	Deep and shallow depth intervals
C-NR4	In-Channel	--	--	--	--	--	--		--	Quarterly	--	--	--	--	--	Deep and shallow depth intervals
C-R22A	In-Channel	--	--	--	--	--	--		--	Quarterly	--	--	--	--	--	Deep and shallow depth intervals
C-R27	In-Channel	--	--	--	--	--	--		--	Quarterly	--	--	--	--	--	Deep and shallow depth intervals
C-TAZ	In-Channel	--	--	--	--	--	--		--	Quarterly	--	--	--	--	--	Deep and shallow depth intervals
R-28	Shoreline	--	--	--	--	--	--		--	Quarterly	--	--	--	--	Annual	
R-19	Shoreline	--	--	--	--	--	--		--	Quarterly	--	--	--	--	--	
R-63	Shoreline	--	--	--	--	--	--		--	Quarterly	--	--	--	--	--	
RRB	Shoreline	--	--	--	--	--	--		--	Quarterly	--	--	Monthly	--	--	
SW-1	Other Surface Water Monitoring Location	--	--	--	--	--	--		--	Quarterly	--	--	--	--	--	
SW-2	Other Surface Water Monitoring Location	--	--	--	--	--	--		--	Quarterly	--	--	--	--	--	

Notes:
1. On June 27, 2014, DTSC approved discontinuation of groundwater sampling at monitoring well MW-45-095a. This location was originally included in the list of wells monitored for conditional shutdown of PE-01.

-- = not applicable.
3V = three volume.
amsl = above mean sea level.
bgs = below ground surface.
Deep = deep interval of Alluvial Aquifer.
DTSC = Department of Toxic Substance Control.
ft = feet.
G = grab sample.
GMP = Groundwater Monitoring Program.
H = HydraSleeve
ID = identification.
IM = interim measure.
LF = low flow (minimal drawdown).
Middle = mid-depth interval of Alluvial Aquifer.
PMP = Performance Monitoring Program.
PVC = polyvinyl chloride (pipe)
RMP = Surface Water Monitoring Program.
Shallow = shallow interval of Alluvial Aquifer.
Tap = sampled from tap of extraction well.

Table 3-1

Groundwater Sampling Results, 2019 Annual Reporting Period

Fourth Quarter 2019 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 Type	Sample Method	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)	Total Chromium (µg/L)	Specific Conductance (µS/cm)	Dissolved Molybdenum (µg/L)	Dissolved Selenium (µg/L)	Nitrate/Nitrite as Nitrogen (mg/L)	Dissolved Arsenic (µg/L)	Dissolved Manganese (µg/L)	Dissolved Iron (µg/L)	ORP (mV)	Field pH (SU)	Turbidity (NTU)
MW-09	SA	03/18/2019	N	LF	140	130	--	2,700	3.6	5.7	12	1.8	ND (0.5)	43	92	7.1	3.0
MW-09	SA	05/17/2019	N	LF	150	150	--	3,200	4.4	5.7	12	1.8	ND (0.5)	--	200	7.4	1.0
MW-09	SA	09/30/2019	N	LF	130	150	--	2,700	4.8	5.8	11	1.7	ND (0.5)	ND (20)	230	7.3	1.0
MW-09	SA	12/18/2019	N	LF	120	120	--	2,700	3.0	4.9	12	1.2	1.7	ND (100)	71	7.7	7.0
MW-10	SA	03/18/2019	N	LF	150	140	--	2,500	19	7.2	12	2.4	5.1	110 J	94	7.3	7.0
MW-10	SA	03/18/2019	FD	--	150	140	--	2,600	20	6.7	12	2.5	4.4	64 J	--	--	--
MW-10	SA	05/17/2019	N	LF	180	180	--	3,100	20	6.4	12	--	--	--	240	7.3	47
MW-10	SA	05/17/2019	FD	--	180	180	--	3,100	19	6.7	12	--	--	--	--	--	--
MW-10	SA	09/30/2019	N	LF	110	110	--	2,400	18	6.3	11	2.1	ND (0.5)	36	170	7.4	9.0
MW-10	SA	12/18/2019	N	LF	220	230	--	2,200	27	6.2	11	2.6	0.87	ND (20)	83	7.7	5.0
MW-11	SA	03/18/2019	N	LF	42	43	--	2,100	5.8	5.5	5.6	1.5	0.68	62	100	7.4	7.0
MW-11	SA	05/17/2019	N	LF	51	49	--	2,300	4.8	4.7	5.1	1.4	1.5	--	190	7.4	1.0
MW-11	SA	09/30/2019	N	LF	44	47	--	2,200	5.3	4.7	5.2	1.3	ND (0.5)	ND (20)	160	7.5	5.0
MW-11	SA	12/18/2019	N	LF	37	35	--	2,300	5.1	4.1	4.9	0.95	3.8	81	98	7.8	8.0
MW-12	SA	05/22/2019	N	LF	1,600	1,600	--	6,900	6.3	32	16	--	--	--	30	8.1	3.0
MW-12	SA	12/17/2019	N	LF	1,600	1,800	--	6,600	11	24 J	14	43 J	1.8	68 J	52	8.2	5.0
MW-13	SA	12/19/2019	N	LF	24	22	--	2,400	10	2.9	--	--	0.75	40	73	7.7	9.0
MW-14	SA	05/15/2019	N	LF	14	13	--	2,800	11	2.0	3.1	0.7	ND (0.5)	--	-66	7.0	3.0
MW-14	SA	12/09/2019	N	LF	10	8.8	--	2,800	13 J	1.8	3.3	0.26	3.4	140 J	72	7.5	38
MW-15	SA	12/12/2019	N	LF	14	14	--	2,000	4.9	3.5	--	--	ND (0.5)	ND (100)	92	7.8	3.0
MW-16	SA	12/09/2019	N	LF	11	10	--	1,000	14	2.1	--	--	ND (0.5)	22	77	7.9	8.0
MW-17	SA	12/09/2019	N	LF	12	11	--	1,200	13	7.0	--	--	ND (0.5)	31	75	7.8	3.0
MW-18	SA	12/09/2019	N	LF	19	19	--	1,500	6.4	3.7	--	--	1.1	49	74	7.6	3.0
MW-19	SA	05/15/2019	N	LF	250	250	--	2,000	--	--	--	--	--	--	-23	6.8	2.0
MW-19	SA	12/12/2019	N	LF	130	120	--	2,000	5.6	3.4	--	--	1.7	130	240	7.9	2.0
MW-20-070	SA	05/24/2019	N	LF	1,700	1,800	--	1,800	35	7.1	8.7	--	--	--	69	7.7	4.0
MW-20-070	SA	12/13/2019	N	LF	2,300	2,200	--	2,100	33	6.9	11	--	0.57	--	-34	7.6	5.0
MW-20-100	MA	05/24/2019	N	LF	1,300	1,500	--	2,200	3.7	6.0	7.9	--	--	--	61	7.1	2.0
MW-20-100	MA	12/13/2019	N	LF	750	780	--	2,200	4.7	5.6	6.7	--	1.7	--	-40	7.4	3.0
MW-20-130	DA	05/24/2019	N	LF	5,900	6,800	--	10,000	42	34	11	4.6	1.7	--	17	7.5	7.0
MW-20-130	DA	05/24/2019	FD	--	6,000	6,800	--	10,000	40	36	11	4.5	2.2	--	--	--	--
MW-20-130	DA	12/13/2019	N	LF	5,900	6,000	--	12,000	37	25 J	13	4.6 J	0.73	--	-120	7.1	3.0
MW-21	SA	05/23/2019	N	LF	6.5	6.7	--	12,000	59	13	0.69	--	--	--	83	7.3	22
MW-21	SA	12/13/2019	N	LF	ND (1.0)	8.9	--	14,000	64	8.8	0.12	--	390	--	67	7.3	44
MW-22	SA	04/23/2019	N	LF	ND (1.0)	ND (1.0)	--	14,000	--	--	--	13	1,900	--	-100	7.0	1.0
MW-22	SA	12/11/2019	N	LF	ND (1.0)	ND (1.0)	--	25,000	28	ND (2.5)	--	6.4	5,600	21,000	-110	6.6	213
MW-22	SA	12/11/2019	FD	--	ND (1.0)	ND (1.0)	--	24,000	29	ND (2.5)	--	6.7	6,100	21,000	--	--	--
MW-23-060	BR	05/21/2019	N	LF	40	35	--	16,000	--	--	--	5.7	ND (0.5)	--	10	9.4	2.0
MW-23-060	BR	12/09/2019	N	LF	41	34	--	17,000	22	5.1	--	1.2	1.1	ND (100)	79	9.1	3.0
MW-23-080	BR	05/21/2019	N	LF	ND (1.0)	1.1	--	17,000	--	--	--	5.6	ND (0.5)	--	-120	9.7	8.0
MW-23-080	BR	12/09/2019	N	LF	ND (1.0)	1.1	--	17,000	47	5.1	--	5.5	0.91	59	45	9.6	3.0
MW-24A	SA	05/17/2019	N	LF	ND (0.2)	ND (1.0)	--	1,600	110	ND (0.5)	0.051	ND (0.1)	16	--	-88	7.9	5.0
MW-24A	SA	12/03/2019	N	LF	ND (0.2)	1.8	--	1,500	120 J	ND (0.5)	0.074	ND (0.1)	6.9	--	-290	8.5	5.0
MW-24B	DA	05/17/2019	N	LF	86	73	--	20,000	56	ND (2.5)	0.71	3.1	100	--	-97	7.4	5.0
MW-24B	DA	05/17/2019	FD	--	84	73	--	20,000	55	ND (2.5)	0.71	3.0	100	--	--	--	--
MW-24B	DA	12/03/2019	N	LF	230	220	--	20,000	57	1.5	1.1	3.9	110 J	--	-210	7.9	7.0
MW-24B	DA	12/03/2019	FD	--	230	230	--	20,000	57	1.8	1.2	3.8	ND (0.5 J)	--	--	--	--
MW-24BR	BR	12/04/2019	N	LF	ND (1.0)	ND (1.0)	--	14,000	54	ND (0.5)	ND (0.05)	0.39	79	140	-240	7.9	1.0
MW-25	SA	05/15/2019	N	LF	68	66	--	2,000	4.2	8.4	12	1.3	ND (0.5)	--	-64	6.7	2.0
MW-25	SA	12/09/2019	N	LF	72	69	--	1,900	6.3	7.4	11	0.9	2.1	46 J	76	7.5	8.0
MW-25	SA	12/09/2019	FD	--	74	71	--	1,900	6.5	7.5	11	1.0	2.0	130 J	--	--	--
MW-26	SA	05/22/2019	N	LF	2,300	2,500	--	3,700	30	39	21	1.9	ND (0.5)	--	77	7.3	17
MW-26	SA	12/12/2019	N	LF	2,300	2,300	--	3,300	31	35	19	1.0	ND (0.5)	24	160	7.4	3.0
MW-26	SA	12/12/2019	FD	--	2,300	2,400	--	3,400	31	35	19	1.1	ND (0.5)	28	--	--	--
MW-27-020	SA	12/10/2019	N	LF	ND (0.2)	1.1	--	1,100	5.0	2.3	0.084	4.8	42	2,900	-37	7.6	9.0
MW-27-060	MA	12/10/2019	N	LF	ND (0.2)	ND (1.0)	--	970	3.9	ND (0.5)	ND (0.05)	9.6	280	560	-110	7.6	8.0
MW-27-085	DA	04/22/2019	N	LF	ND (0.2)	ND (1.0)	--	10,000	17	ND (0.5)	ND (0.05)	1.6	86	--	120	7.3	1.0
MW-27-085	DA	12/10/2019	N	LF	ND (0.2)	ND (1.0)	--	9,600	19	ND (0.5)	ND (0.05)	ND (0.1)	98	140	-25	7.4	2.0

Table 3-1

Groundwater Sampling Results, 2019 Annual Reporting Period

Fourth Quarter 2019 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 Type	Sample Method	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)	Total Chromium (µg/L)	Specific Conductance (µS/cm)	Dissolved Molybdenum (µg/L)	Dissolved Selenium (µg/L)	Nitrate/Nitrite as Nitrogen (mg/L)	Dissolved Arsenic (µg/L)	Dissolved Manganese (µg/L)	Dissolved Iron (µg/L)	ORP (mV)	Field pH (SU)	Turbidity (NTU)
MW-28-025	SA	05/21/2019	N	LF	ND (0.2)	ND (1.0)	--	1,000	4.4	ND (0.5)	ND (0.05)	0.81	ND (0.5)	--	81	7.5	2.0
MW-28-025	SA	12/09/2019	N	LF	ND (0.2)	ND (1.0)	--	1,200	4.0	1.7	ND (0.05)	0.45	7.4	30	13	7.0	3.0
MW-28-090	DA	05/21/2019	N	LF	ND (0.2)	ND (1.0)	--	4,600	23	ND (0.5)	ND (0.05)	2.2	280	--	-25	7.1	16
MW-28-090	DA	12/09/2019	N	LF	ND (0.2)	ND (1.0)	--	7,600	22	ND (0.5)	ND (0.05)	1.7	100	510	-65	7.1	2.0
MW-29	SA	05/21/2019	N	LF	ND (0.2)	ND (1.0)	--	2,500	30	ND (0.5)	ND (0.05)	15	300	--	-160	7.4	2.0
MW-29	SA	12/10/2019	N	LF	ND (0.2)	ND (1.0)	--	1,900	8.9	ND (0.5)	ND (0.05)	11	200	1,200	-110	7.3	8.0
MW-30-030	SA	12/05/2019	N	LF	ND (1.0)	ND (1.0)	--	7,100	56	1.3	0.1	4.6	150	560	-32	7.7	2.0
MW-30-050	MA	12/05/2019	N	LF	ND (0.2)	ND (1.0)	--	1,000	4.4	ND (0.5)	ND (0.05)	2.9	210	68	22	7.6	1.0
MW-31-060	SA	05/20/2019	N	LF	250	240	--	3,800	--	--	--	1.0	0.7	--	68	7.5	16
MW-31-060	SA	05/20/2019	FD	--	250	240	--	3,900	--	--	--	1.0	ND (0.5)	--	--	--	--
MW-31-060	SA	12/12/2019	N	LF	370	370	--	3,200	15	2.7	3.5	0.42	ND (0.5)	ND (100)	-9.9	7.7	2.0
MW-31-060	SA	12/12/2019	FD	--	370	360	--	3,100	14	2.7	3.3	0.36	ND (0.5)	29	--	--	--
MW-31-135	DA	12/12/2019	N	LF	13	14	--	11,000	25	0.73	--	3.6	1.8	ND (100)	-130	7.8	8.0
MW-32-020	SA	12/09/2019	N	LF	ND (1.0)	ND (1.0)	--	23,000	120	2.0	--	3.0	180	5,700	-130	6.8	8.0
MW-32-035	SA	04/23/2019	N	LF	ND (0.2)	ND (1.0)	--	7,400	--	--	--	4.6	890	--	-50	7.0	15
MW-32-035	SA	12/09/2019	N	LF	ND (1.0)	ND (1.0)	--	9,300	12	ND (0.5)	0.051	15	820	13,000	-130	7.0	19
MW-33-040	SA	04/23/2019	N	LF	ND (0.2)	ND (1.0)	--	8,700	130	ND (0.5)	ND (0.05)	10	15	--	61	7.8	1.0
MW-33-040	SA	12/05/2019	N	LF	ND (1.0)	ND (1.0)	--	14,000	220	0.85	0.28	9.7	5.3	ND (100)	82	7.2	1.0
MW-33-040	SA	12/05/2019	FD	--	ND (1.0)	ND (1.0)	--	14,000	240	0.86	0.3	9.6	2.7	ND (100)	--	--	--
MW-33-090	MA	04/22/2019	N	LF	2.5	5.5	--	9,800	8.6	ND (0.5)	1.1	1.2	9.2	--	58	7.0	27
MW-33-090	MA	12/05/2019	N	LF	2.7	3.8	--	9,500	8.3	ND (0.5)	1.1	1.0	7.5	ND (100)	73	7.3	6.0
MW-33-090	MA	12/05/2019	FD	--	2.8	3.9	--	9,400	8.4	ND (0.5)	1.1	1.0	6.6	63	--	--	--
MW-33-150	DA	05/21/2019	N	LF	5.5	21	--	14,000	48	0.93	1.5	1.7	74	--	84	7.5	20
MW-33-150	DA	12/05/2019	N	LF	2.0	7.7	--	15,000	48	0.85	1.8	1.0	10	ND (100)	110	7.4	8.0
MW-33-150	DA	12/05/2019	FD	--	1.9	7.6	--	14,000	46	0.76	1.6	1.0	9.7	84	--	--	--
MW-33-210	DA	04/22/2019	N	LF	10	9.2	--	19,000	19	ND (2.5)	1.6	1.4	ND (0.5)	--	130	7.5	1.0
MW-33-210	DA	12/05/2019	N	LF	13	15	--	19,000	18	0.88	1.8	1.2	26	ND (100)	110	7.5	5.0
MW-33-210	DA	12/05/2019	FD	--	13	15	--	19,000	18	0.87	1.9	1.2	25	ND (100)	--	--	--
MW-34-055	MA	12/10/2019	N	LF	ND (0.2)	ND (1.0)	--	940	4.6	ND (0.5)	ND (0.05)	2.8	71	94	-85	7.6	4.0
MW-34-055	MA	12/10/2019	FD	--	ND (0.2)	ND (1.0)	--	940	5.0	ND (0.5)	ND (0.05)	2.9	76	81	--	--	--
MW-34-080	DA	04/24/2019	N	LF	ND (0.2)	ND (1.0)	--	7,900	--	--	ND (0.05)	1.4	55	--	51	7.1	1.0
MW-34-080	DA	12/10/2019	N	LF	ND (0.2)	ND (1.0)	--	8,100	17	ND (2.5)	ND (0.05)	ND (0.1)	58	170	-41	7.3	3.0
MW-34-080	DA	12/10/2019	FD	--	ND (0.2)	ND (1.0)	--	8,100	12	ND (0.5)	ND (0.05)	ND (0.1)	55	170	--	--	--
MW-34-100	DA	02/14/2019	N	LF	ND (1.0)	1.7	--	11,000	62	ND (0.5)	ND (0.05)	1.4	110	--	-86	7.6	2.0
MW-34-100	DA	04/24/2019	N	LF	ND (0.2)	ND (1.0)	--	9,700	56	ND (0.5)	ND (0.05)	1.6	140	--	-2.2	7.6	1.0
MW-34-100	DA	10/01/2019	N	LF	ND (0.2)	ND (1.0)	--	10,000	60	ND (0.5)	ND (0.05)	2.0	64	--	100	7.3	7.0
MW-34-100	DA	12/10/2019	N	LF	ND (1.0)	1.6	--	13,000	47	ND (0.5)	ND (0.05)	1.6	97	470	-67	7.6	2.0
MW-34-100	DA	12/10/2019	FD	--	ND (1.0)	1.9	--	14,000	45	ND (0.5)	ND (0.05)	1.6	96	65	--	--	--
MW-35-060	SA	05/24/2019	N	LF	24	22	--	4,600	11	1.5	2.0	1.3	ND (0.5)	--	83	7.5	24
MW-35-060	SA	12/13/2019	N	LF	24	21	--	6,100	10	1.1	2.1	ND (0.1)	ND (0.5)	ND (20)	51	7.5	14
MW-35-135	DA	05/24/2019	N	LF	28	24	--	9,200	19	1.3	2.4	0.82	1.3	--	95	7.7	8.0
MW-35-135	DA	12/13/2019	N	LF	28	25	--	11,000	22	1.0	2.5	0.95	0.6	ND (100)	35	7.7	27
MW-35-135	DA	12/13/2019	FD	--	28	24	--	11,000	23	1.0	2.2	0.89	ND (0.5)	ND (100)	--	--	--
MW-36-020	SA	12/04/2019	N	LF	ND (0.2)	ND (1.0)	--	5,700	17	ND (0.5)	--	ND (0.1)	350	880	-210	7.4	6.0
MW-36-040	SA	12/04/2019	N	LF	ND (0.2)	ND (1.0)	--	1,000	2.4	ND (0.5)	0.062	4.5	140	880	-260	7.9	3.0
MW-36-050	MA	12/04/2019	N	LF	ND (0.2)	ND (1.0)	--	950	3.6	ND (0.5)	--	5.2	200	180	-230	7.5	3.0
MW-36-070	MA	12/04/2019	N	LF	ND (0.2)	ND (1.0)	--	980	4.6	ND (0.5)	--	2.0	200	39	-240	7.8	3.0
MW-36-090	DA	04/24/2019	N	LF	ND (0.2)	ND (1.0)	--	4,800	--	--	--	3.3	65	--	20	7.2	1.0
MW-36-090	DA	12/04/2019	N	LF	ND (0.2)	ND (1.0)	--	5,000	12	ND (0.5)	--	2.1	67	30	-210	7.3	3.0
MW-36-100	DA	04/24/2019	N	LF	7.4	11	--	6,600	19	ND (0.5)	ND (0.05)	3.2	340	--	-60	7.5	1.0
MW-36-100	DA	04/24/2019	FD	--	7.1	11	--	6,600	20	ND (0.5)	ND (0.05)	3.2	330	--	--	--	--
MW-36-100	DA	12/04/2019	N	LF	7.5	9.8	--	7,100	18	ND (0.5)	ND (0.05)	0.81	240	220	-230	7.5	3.0
MW-37D	DA	05/20/2019	N	LF	6.2	6.0	--	14,000	60	ND (0.5)	0.55	--	--	--	86	7.7	3.0
MW-37D	DA	12/19/2019	N	LF	4.8	4.5	--	13,000	59	0.67	0.79	--	1.4	31	44	7.8	3.0
MW-37S	MA	12/19/2019	N	LF	12	11	--	6,900	14	0.7	--	ND (0.1)	1.0	84	42	7.7	7.0
MW-38D	DA	05/17/2019	N	LF	21	17	--	22,000	80	ND (2.5)	ND (0.05)	7.2	21	--	-94	7.8	9.0
MW-38D	DA	12/18/2019	N	LF	19	21	--	21,000	87	ND (2.5)	ND (0.05)	1.7	47	240	31	8.4	15

Table 3-1

Groundwater Sampling Results, 2019 Annual Reporting Period

Fourth Quarter 2019 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 Type	Sample Method	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)	Total Chromium (µg/L)	Specific Conductance (µS/cm)	Dissolved Molybdenum (µg/L)	Dissolved Selenium (µg/L)	Nitrate/Nitrite as Nitrogen (mg/L)	Dissolved Arsenic (µg/L)	Dissolved Manganese (µg/L)	Dissolved Iron (µg/L)	ORP (mV)	Field pH (SU)	Turbidity (NTU)
MW-38S	SA	02/13/2019	N	LF	5.1	5.6	--	1,600	32	2.6	3.8	6.0	57	--	-66	7.5	3.0
MW-38S	SA	05/17/2019	N	LF	6.0	5.7	--	1,700	22	3.7	5.2	5.8	46	--	-68	7.4	5.0
MW-38S	SA	09/25/2019	N	LF	4.8	4.7	--	1,700	23	4.7	4.4	5.5	52	--	-1.9	8.0	5.0
MW-38S	SA	12/18/2019	N	LF	4.7	4.5	--	1,600	26	2.4	4.6	6.6	160	31	71	8.0	5.0
MW-38S-SMT	SA	02/13/2019	N	3V	3.7	3.8	--	1,600	30	3.7	4.5	6.3	75	--	-35	7.4	2.0
MW-39-040	SA	12/05/2019	N	LF	ND (0.2)	ND (1.0)	--	1,100	--	--	--	16	73	--	-180	7.6	3.0
MW-39-050	MA	12/05/2019	N	LF	ND (0.2)	ND (1.0)	--	990	4.0	ND (0.5)	--	1.7	160	ND (20)	24	8.0	3.0
MW-39-060	MA	12/05/2019	N	LF	ND (0.2)	ND (1.0)	--	1,000	4.7	ND (0.5)	ND (0.05)	2.4	100	29	25	8.0	3.0
MW-39-070	MA	12/05/2019	N	LF	ND (0.2)	ND (1.0)	--	2,000	19	ND (0.5)	--	--	3.9	ND (20)	8.8	7.9	3.0
MW-39-080	DA	12/05/2019	N	LF	0.52	2.5	--	5,300	29	ND (0.5)	--	--	4.2	120	-210	8.1	3.0
MW-39-100	DA	04/24/2019	N	LF	88	89	--	12,000	7.1	ND (0.5)	0.1	2.2	11	--	54	6.8	8.0
MW-39-100	DA	12/05/2019	N	LF	87	82	--	13,000	7.1	ND (0.5)	0.099	2.2	5.9	27	30	7.3	8.0
MW-40D	DA	05/22/2019	N	LF	120	120	--	15,000	54	2.0	2.5	4.5	ND (0.5)	--	-62	7.5	6.0
MW-40D	DA	05/22/2019	FD	--	120	120	--	15,000	54	1.9	2.6	4.5	ND (0.5)	--	--	--	--
MW-40D	DA	12/11/2019	N	LF	150	130	--	15,000	50	2.0	3.1	4.8 J	3.2	57 J	25	7.7	4.0
MW-40S	SA	05/22/2019	N	H	12	15	--	2,100	18	5.6	5.6	2.7	1.8	--	26	7.4	15
MW-40S	SA	12/11/2019	N	H	17	17	--	2,000	19	5.8	8.9	2.4	ND (0.5)	--	77	7.2	9.0
MW-41D	DA	05/15/2019	N	LF	ND (1.0)	ND (1.0)	--	18,000	73	ND (0.5)	ND (0.05)	2.4	180	--	-79	7.1	2.0
MW-41D	DA	12/17/2019	N	LF	ND (1.0)	1.8	--	21,000	74	ND (2.5)	0.59	ND (0.5)	39	ND (100)	21	7.8	2.0
MW-41M	DA	12/17/2019	N	LF	9.6	11	--	14,000	24	0.65	0.58	2.4	5.0	140	23	7.7	9.0
MW-41S	SA	12/17/2019	N	LF	7.2	6.8	--	6,400	13	1.8	2.2	ND (0.1)	ND (0.5)	38	56	7.8	15
MW-42-030	SA	12/11/2019	N	LF	ND (1.0)	ND (1.0)	--	2,900	24	ND (0.5)	0.075	1.1	37	--	-130	8.0	3.0
MW-42-055	MA	04/23/2019	N	LF	ND (0.2)	ND (1.0)	--	1,000	--	--	--	26	19	--	-36	8.3	1.0
MW-42-055	MA	12/11/2019	N	LF	ND (0.2)	ND (1.0)	--	940	3.0	ND (0.5)	--	22	280	360	-84	8.1	2.0
MW-42-065	MA	04/23/2019	N	LF	ND (0.2)	ND (1.0)	--	2,200	--	--	--	8.3	540	--	-10	7.5	1.0
MW-42-065	MA	12/11/2019	N	LF	ND (0.2)	ND (1.0)	--	3,000	8.7	ND (0.5)	--	8.2	900	55	60	7.3	3.0
MW-43-025	SA	12/12/2019	N	LF	ND (0.2)	1.9	--	1,500	6.5	ND (0.5)	--	22	350	3,700	-140	7.3	231
MW-43-075	DA	12/12/2019	N	LF	ND (1.0)	ND (1.0)	--	11,000	15	ND (0.5)	--	12	640	3,500	-130	7.0	2.0
MW-43-090	DA	12/12/2019	N	LF	ND (1.0)	ND (1.0)	--	16,000	27	ND (0.5)	--	3.1	530	870	-34	6.9	4.0
MW-44-070	MA	04/24/2019	N	LF	ND (0.2)	ND (1.0)	--	1,800	--	--	--	2.7	230	--	-60	7.2	4.0
MW-44-070	MA	12/11/2019	N	LF	ND (0.2)	ND (1.0)	--	1,100	6.3	ND (0.5)	--	3.4	140	370	-120	7.6	5.0
MW-44-115	DA	02/15/2019	N	LF	9.7	17	--	11,000	100	ND (0.5)	0.062	6.0	13	--	-100	6.9	2.0
MW-44-115	DA	04/24/2019	N	LF	6.0	6.1	--	10,000	68	ND (0.5)	ND (0.05)	5.2	6.1	--	91	7.5	3.0
MW-44-115	DA	10/01/2019	N	LF	6.2	6.3	--	11,000	89	ND (0.5)	ND (0.05)	6.4	ND (0.5)	--	140	7.7	4.0
MW-44-115	DA	12/11/2019	N	LF	6.7	7.3	--	10,000	77	ND (0.5)	0.066	5.6	8.4	ND (100)	-11	7.8	2.0
MW-44-125	DA	04/24/2019	N	LF	1.9	10	--	5,700	120	ND (0.5)	ND (0.05)	5.9	270	--	-88	7.7	1.0
MW-44-125	DA	12/11/2019	N	LF	2.6	3.8	--	14,000	220	ND (0.5)	0.09	4.9	310	250	-47	7.5	2.0
MW-46-175	DA	02/15/2019	N	LF	8.1	18	--	18,000	190	0.69	1.2	--	--	--	-88	6.9	2.0
MW-46-175	DA	02/15/2019	FD	--	7.9	20	--	18,000	200	0.63	1.2	--	--	--	--	--	--
MW-46-175	DA	05/21/2019	N	LF	7.6	9.1	--	17,000	190	0.78	1.1	--	--	--	140	7.5	1.0
MW-46-175	DA	10/01/2019	N	LF	6.0	6.1	--	17,000	190	ND (0.5)	1.1	--	--	--	120	7.9	5.0
MW-46-175	DA	12/04/2019	N	LF	5.1	6.3	--	18,000	180	0.72	1.1	--	17	ND (100)	120	8.2	7.0
MW-46-205	DA	05/21/2019	N	LF	2.4	2.7	--	21,000	--	--	--	--	--	--	110	8.4	2.0
MW-46-205	DA	12/04/2019	N	LF	ND (1.0)	6.2	--	20,000	330	0.98	--	--	32	ND (100)	140	7.9	9.0
MW-47-055	SA	05/16/2019	N	LF	17	15	--	4,800	--	--	--	1.1	ND (0.5)	--	120	7.4	14
MW-47-055	SA	05/16/2019	FD	--	17	15	--	4,700	--	--	--	1.1	ND (0.5)	--	--	--	--
MW-47-055	SA	12/04/2019	N	LF	21	18	--	4,400	7.8	1.1	--	0.38	ND (0.5)	ND (20)	77	7.5	7.0
MW-47-115	DA	05/16/2019	N	LF	27	23	--	12,000	--	--	--	--	--	--	150	7.4	28
MW-47-115	DA	12/04/2019	N	LF	16	22	--	14,000	21	1.1	--	--	5.6	ND (100)	21	7.6	4.0
MW-48	BR	05/23/2019	N	LF	ND (1.0)	ND (1.0)	--	17,000	--	--	--	--	--	--	77	7.9	8.0
MW-48	BR	12/19/2019	N	3V	ND (1.0)	ND (1.0)	--	17,000	9.6	ND (0.5)	--	--	8.3	ND (100)	81	8.0	16
MW-49-135	DA	12/10/2019	N	3V	1.7	5.3	--	13,000	32	1.2	--	1.6	290	350	-160	7.7	9.0
MW-49-275	DA	12/05/2019	N	LF	ND (1.0)	31	--	26,000	260	ND (2.5)	--	--	470	190	120	7.1	2.0
MW-49-365	DA	12/05/2019	N	LF	ND (1.0)	ND (5.0)	--	35,000	180	ND (2.5)	--	--	5.5	ND (100)	150	7.2	9.0
MW-50-095	MA	05/20/2019	N	LF	13	12	--	5,600	--	--	--	--	--	--	210	7.8	14
MW-50-095	MA	12/12/2019	N	LF	13	14	--	5,500	15	0.83	--	--	5.5	76	160	7.5	3.0

Table 3-1

Groundwater Sampling Results, 2019 Annual Reporting Period

Fourth Quarter 2019 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 Type	Sample Method	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)	Total Chromium (µg/L)	Specific Conductance (µS/cm)	Dissolved Molybdenum (µg/L)	Dissolved Selenium (µg/L)	Nitrate/Nitrite as Nitrogen (mg/L)	Dissolved Arsenic (µg/L)	Dissolved Manganese (µg/L)	Dissolved Iron (µg/L)	ORP (mV)	Field pH (SU)	Turbidity (NTU)
MW-50-200	DA	05/20/2019	N	LF	5,800	6,200	--	21,000	--	--	--	--	--	--	250	7.8	1.0
MW-50-200	DA	12/12/2019	N	LF	2,200	2,100	--	18,000	38	1.8	--	3.3	2.1	130	230	7.6	1.0
MW-50-200	DA	12/12/2019	FD	--	2,200	2,100	--	18,000	37	1.8	--	3.2	2.2	ND (100)	--	--	--
MW-51	MA	05/22/2019	N	LF	3,300	3,800	--	13,000	48	15	8.3	4.1	ND (0.5)	--	89	7.4	1.0
MW-51	MA	12/12/2019	N	LF	3,600	3,900	--	11,000	45	27	10	3.9	0.8	ND (100)	200	7.1	1.0
MW-51	MA	12/12/2019	FD	--	3,600	4,000	--	11,000	46	28	9.6	3.9	1.8	ND (100)	--	--	--
MW-52D	DA	04/23/2019	N	LF	ND (1.0)	ND (1.0)	--	19,000	--	--	--	3.0	260	--	-160	7.5	1.0
MW-52D	DA	04/23/2019	FD	--	ND (1.0)	ND (1.0)	--	19,000	--	--	--	3.0	270	--	--	--	--
MW-52D	DA	12/12/2019	N	LF	ND (1.0)	ND (1.0)	--	19,000	71	ND (0.5)	--	2.5	270	620	-140	7.9	1.0
MW-52M	DA	04/23/2019	N	LF	ND (1.0)	ND (1.0)	--	14,000	--	--	--	1.3	150	--	-17	7.0	1.0
MW-52M	DA	12/12/2019	N	LF	ND (1.0)	ND (1.0)	--	15,000	34	ND (0.5)	--	1.3	180	1,400	-130	7.4	1.0
MW-52S	MA	04/23/2019	N	LF	ND (0.2)	ND (1.0)	--	9,400	--	--	--	0.38	1,200	--	-110	7.1	1.0
MW-52S	MA	12/12/2019	N	LF	ND (0.2)	ND (1.0)	--	9,500	3.7	ND (0.5)	--	0.29	1,300	17,000	-86	6.9	3.0
MW-53D	DA	04/23/2019	N	LF	ND (1.0)	ND (1.0)	--	24,000	--	--	--	4.2	1,400	--	-130	8.3	1.0
MW-53D	DA	12/12/2019	N	LF	ND (1.0)	ND (1.0)	--	24,000	170	ND (2.5)	--	ND (0.5)	1,300	540	-94	8.1	2.0
MW-53M	DA	04/23/2019	N	LF	ND (1.0)	ND (1.0)	--	18,000	--	--	--	0.82	430	--	85	7.6	1.0
MW-53M	DA	12/12/2019	N	LF	ND (1.0)	ND (1.0)	--	18,000	62	ND (0.5)	--	0.84	470	420	-150	8.0	1.0
MW-54-085	DA	05/23/2019	N	LF	ND (0.1)	ND (2.0)	--	8,040	--	--	--	ND (2.0)	531	--	-82	7.6	12
MW-54-085	DA	12/10/2019	N	LF	ND (0.1)	ND (1.0)	--	7,710	ND (2.5)	--	--	ND (1.0)	810	ND (50)	15	7.4	5.0
MW-54-140	DA	05/23/2019	N	LF	ND (0.5)	ND (2.0)	--	12,600	--	--	--	ND (2.0)	ND (2.0)	--	-67	7.7	1.0
MW-54-140	DA	12/10/2019	N	LF	ND (0.5)	ND (1.0)	--	10,800	56.4	--	--	ND (1.0)	75.4	ND (50)	-6.1	7.7	8.0
MW-54-195	DA	05/23/2019	N	LF	ND (0.5)	15.1	--	21,800	--	--	--	ND (2.0)	273	--	-160	8.1	1.0
MW-54-195-1FF	DA	08/22/2019	N	LF	ND (0.5)	ND (2.0)	--	--	--	--	--	--	--	--	37	8.3	12
MW-54-195-2FF	DA	08/22/2019	N	LF	ND (0.5)	ND (2.0)	--	--	--	--	--	--	--	--	--	--	--
MW-54-195	DA	12/10/2019	N	LF	ND (0.5)	ND (1.0)	--	17,300	105	--	--	ND (1.0)	323	ND (50)	-270	7.8	3.0
MW-55-045	MA	05/23/2019	N	LF	ND (0.1)	ND (2.0)	--	1,300	--	--	--	--	--	--	-78	7.7	1.0
MW-55-045	MA	12/10/2019	N	LF	ND (0.1)	ND (1.0)	--	1,150	ND (2.5)	--	--	--	875	ND (50)	7.0	7.6	9.0
MW-55-120	DA	05/23/2019	N	LF	7.49	ND (2.0)	--	8,060	--	--	--	--	--	--	83	8.0	12
MW-55-120	DA	12/10/2019	N	LF	6.55	8.19	--	6,920	63.9	--	--	--	ND (1.0)	ND (50)	37	7.9	7.0
MW-56D	DA	05/23/2019	N	LF	ND (0.5)	ND (2.0)	--	21,700	--	--	--	--	--	--	-71	7.3	1.0
MW-56D	DA	12/10/2019	N	LF	ND (0.5)	ND (1.0)	--	15,000	ND (2.5)	--	--	--	947	1,110	-130	7.6	3.0
MW-56D	DA	12/10/2019	FD	--	ND (0.5)	ND (1.0)	--	15,300	ND (2.5)	--	--	--	858	990	--	--	--
MW-56M	DA	05/23/2019	N	LF	ND (0.5)	ND (2.0)	--	11,000	--	--	--	--	--	--	-81	7.0	1.0
MW-56M	DA	12/10/2019	N	LF	ND (0.5)	ND (1.0)	--	9,290	ND (2.5)	--	--	--	748	2,900	-120	7.4	3.0
MW-56S	SA	05/23/2019	N	LF	ND (0.1)	ND (2.0)	--	5,320	--	--	--	--	--	--	-110	7.0	1.0
MW-56S	SA	12/10/2019	N	LF	ND (0.1)	ND (1.0)	--	4,280	ND (2.5)	--	--	--	653	4,000	-91	7.4	3.0
MW-57-070	BR	05/20/2019	N	LF	380	400	--	2,600	4.0	3.2	9.6	1.3	1.2	--	54	7.5	8.0
MW-57-070	BR	12/06/2019	N	LF	420	390	--	2,700	4.3	3.4	10	1.1	2.8	110	-51	7.2	5.0
MW-57-185	BR	05/20/2019	N	LF	4.6	5.2	--	18,000	81	ND (2.5)	0.11	3.4	6.2 J	--	19	8.9	6.0
MW-57-185	BR	05/20/2019	FD	--	4.7	5.1	--	18,000	83	ND (2.5)	0.1	3.4	4.8 J	--	--	--	--
MW-57-185	BR	12/06/2019	N	LF	3.7	3.4	--	18,000	78	ND (0.5)	0.23	3.5	1.6	ND (100)	-200	9.6	5.0
MW-58BR	BR	02/14/2019	N	LF	7.4	9.4	--	8,300	26	1.8	0.61	1.7	320	--	28	7.7	26
MW-58BR	BR	05/21/2019	N	LF	12	14	--	8,200	26	1.9	0.68	1.9	270	--	34	7.7	43
MW-58BR	BR	08/19/2019	N	LF	90	88 J	--	7,500	22	2.7	1.5	1.9	230	--	44	7.9	3.0
MW-58BR	BR	08/19/2019	FD	--	90	89 J	--	7,600	23	2.6	1.4	1.9	220	--	--	--	--
MW-58BR	BR	12/13/2019	N	LF	76	70	--	8,700	23	2.4	1.2	ND (0.1)	190	110	-170	7.5	3.0
MW-59-100	SA	05/20/2019	N	LF	2,000	2,200	--	14,000	9.4	1.8	1.7	2.3	ND (0.5)	--	110	7.0	15
MW-59-100	SA	05/20/2019	FD	--	2,200	2,300	--	14,000	9.0	1.9	1.7	2.2	2.9	--	--	--	--
MW-59-100	SA	12/13/2019	N	LF	2,700	2,800	--	14,000	5.3	2.4	2.4	2.0	4.8	ND (100)	150	7.1	30
MW-59-100	SA	12/13/2019	FD	--	2,700	2,700	--	13,000	5.1	2.4	2.1	2.1	4.0	ND (100)	--	--	--
MW-60-125	BR	05/22/2019	N	LF	880	890	--	8,700	17	6.2	3.7	1.6	4.3	--	47	7.4	31
MW-60-125	BR	12/06/2019	N	LF	580	540	--	8,700	17	5.8	4.1	1.6	5.1	30	80	7.5	22
MW-60BR-245	BR	02/14/2019	N	3V	110	110	--	16,000	57	2.1	0.27	7.3	13	--	-81	7.7	3.0
MW-60BR-245	BR	05/22/2019	N	3V	130	120	--	16,000	60	2.7	0.3	8.8	7.9	--	68	7.9	7.0
MW-60BR-245	BR	12/12/2019	N	3V	64	52	--	16,000	58	2.6	0.29	7.5	3.6	ND (100)	17	7.9	1.0
MW-60BR-245_D	BR	02/14/2019	N	LF	18	17	--	16,000	62	2.2	0.18	6.6	21	--	16	7.6	3.0
MW-60BR-245_D	BR	05/23/2019	N	LF	68	61	--	17,000	63	3.2	0.22	9.2	6.7	--	3.1	7.9	1.0
MW-60BR-245_D	BR	12/13/2019	N	LF	75	61	--	17,000	58	2.4	0.18	8.4	5.3	ND (100)	30	7.9	1.0

Table 3-1

Groundwater Sampling Results, 2019 Annual Reporting Period

Fourth Quarter 2019 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 Type	Sample Method	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)	Total Chromium (µg/L)	Specific Conductance (µS/cm)	Dissolved Molybdenum (µg/L)	Dissolved Selenium (µg/L)	Nitrate/Nitrite as Nitrogen (mg/L)	Dissolved Arsenic (µg/L)	Dissolved Manganese (µg/L)	Dissolved Iron (µg/L)	ORP (mV)	Field pH (SU)	Turbidity (NTU)
MW-60BR-245_S	BR	02/14/2019	N	LF	25	29	--	16,000	63	2.9	0.18	7.3	21	--	3.5	7.3	5.0
MW-60BR-245_S	BR	05/23/2019	N	LF	85	74	--	17,000	59	2.7	0.22	8.7	6.7	--	8.1	7.8	1.0
MW-60BR-245_S	BR	12/13/2019	N	LF	86	76	--	18,000	57	2.6	0.26	6.7	4.4	ND (100)	27	7.9	1.0
MW-61-110	BR	05/23/2019	N	LF	280	280	--	16,000	23	0.87	0.54	3.7	210	--	-94	7.4	7.0
MW-61-110	BR	12/06/2019	N	LF	480	460	--	17,000	20	1.3	0.87	3.7	160	ND (100)	88	6.7	4.0
MW-62-065	BR	02/11/2019	N	LF	470	550	--	6,100	16	4.6	4.7	1.7	2.5	--	-52	7.0	12
MW-62-065	BR	05/21/2019	N	LF	570	560	--	6,200	13	4.3	4.8	1.6	0.89	--	62	7.4	7.0
MW-62-065	BR	10/01/2019	N	LF	490	530	--	6,200	14	4.2	4.7	1.8	ND (0.5)	--	200	7.3	3.0
MW-62-065	BR	12/03/2019	N	LF	560	540	--	6,000	13	3.8	4.3	1.7	ND (0.5)	35	99	7.7	11
MW-62-110	BR	02/14/2019	N	LF	ND (1.0)	ND (1.0)	--	11,000	69	1.1	0.28	13	140	--	-50	7.3	2.0
MW-62-110	BR	05/22/2019	N	G	ND (1.0)	ND (1.0)	--	12,000	68	ND (0.5)	ND (0.05)	3.0	150	--	-61	7.5	1.0
MW-62-110	BR	09/25/2019	N	G	ND (1.0)	ND (1.0)	--	12,000	45	ND (0.5)	0.097	3.6	64	--	16	7.4	3.0
MW-62-110	BR	12/04/2019	N	G	0.59	ND (1.0)	--	9,800	37	ND (0.5)	ND (0.05)	4.0	150	45 J	-15	7.5	2.0
MW-62-190	BR	05/22/2019	N	G	ND (1.0)	ND (1.0)	--	18,000	46	ND (0.5)	ND (0.05)	1.3	780	--	-94	7.7	2.0
MW-62-190	BR	12/04/2019	N	LF	ND (1.0)	ND (1.0)	--	18,000	39	ND (0.5)	0.11	4.7	930	ND (100)	-17	7.5	2.0
MW-63-065	BR	02/14/2019	N	LF	1.1	1.3	--	6,600	18	0.83	0.77	1.6	22	--	62	6.9	26
MW-63-065	BR	05/21/2019	N	LF	1.3	2.8	--	6,700	19	1.0	0.93	1.5	2.5	--	15	7.1	9.0
MW-63-065	BR	09/26/2019	N	LF	1.2	1.0	--	6,400	16	0.91	1.2	1.5	ND (0.5)	--	120	7.4	11
MW-63-065	BR	09/26/2019	FD	--	1.2	1.1	--	6,500	15	0.89	1.2	1.5	ND (0.5)	--	--	--	--
MW-63-065	BR	12/06/2019	N	LF	1.4	3.0	--	6,700	17	0.8	1.2	ND (0.1)	2.1	ND (100)	-54	7.1	5.0
MW-64BR	BR	02/13/2019	N	LF	ND (1.0)	ND (1.0)	--	13,000	65	ND (0.5)	ND (0.05)	4.1	940	--	-42	7.0	2.0
MW-64BR	BR	05/21/2019	N	LF	ND (1.0)	ND (1.0)	--	13,000	65	ND (0.5)	ND (0.05)	4.0	960	--	-69	7.2	5.0
MW-64BR	BR	08/22/2019	N	LF	ND (1.0)	ND (1.0)	--	13,000	62	ND (0.5)	ND (0.05)	3.6	840	--	12	7.7	3.0
MW-64BR	BR	12/06/2019	N	LF	ND (1.0)	ND (1.0)	--	14,000	61	ND (0.5)	ND (1.0)	3.1	960	550	52	7.5	1.0
MW-65-160	SA	02/13/2019	N	LF	220	220	--	3,800	42	11	15	0.76	ND (0.5)	--	25	6.8	8.0
MW-65-160	SA	05/16/2019	N	LF	160	190	--	4,000	110	9.4	14	0.69	76	--	100	7.3	20
MW-65-160	SA	09/26/2019	N	LF	150	160	--	3,900	65	9.8	14	0.61	7.5	--	41	7.4	9.0
MW-65-160	SA	12/03/2019	N	LF	260	260	--	3,900	35	11	14	0.97	ND (0.5)	97	88	7.1	6.0
MW-65-225	DA	02/13/2019	N	LF	490	490	--	8,700	28	8.2	9.4	2.2	12	--	27	6.8	14
MW-65-225	DA	05/16/2019	N	LF	180	160	--	15,000	44	2.3	2.6	2.5	40	--	110	7.2	27
MW-65-225	DA	09/26/2019	N	LF	330	340	--	13,000	34	4.1	5.2	2.4	ND (0.5)	--	30	7.3	4.0
MW-65-225	DA	09/26/2019	FD	--	330	320	--	13,000	33	4.6	5.7	2.3	ND (0.5)	--	--	--	--
MW-65-225	DA	12/03/2019	N	LF	480	450	--	7,000	26	8.1	9.2	2.3	ND (0.5)	51	80	7.3	5.0
MW-66-165	SA	05/16/2019	N	LF	550	570	--	3,900	5.5	28	25	1.2	ND (0.5)	--	-24	7.0	45
MW-66-165	SA	05/16/2019	FD	--	540	580	--	4,000	5.5	28	25	1.2	ND (0.5)	--	--	--	--
MW-66-165	SA	12/03/2019	N	LF	480	480	--	3,700	5.1	25	22	1.3	ND (0.5)	110	90	7.2	25
MW-66-230	DA	05/16/2019	N	LF	6,400	7,000	--	19,000	71	9.0	11	9.8	3.6	--	-92	7.4	3.0
MW-66-230	DA	12/03/2019	N	LF	6,800	6,600	--	17,000	78	18	21	8.7	ND (0.5)	ND (100)	51	7.9	8.0
MW-66BR-270	BR	05/22/2019	N	3V	ND (1.0)	ND (1.0)	--	2,300	10	ND (0.5)	1.7	ND (0.1)	66	--	-300	9.6	1.0
MW-66BR-270	BR	12/10/2019	N	3V	ND (1.0)	ND (1.0)	--	10,000	7.3	ND (0.5)	ND (0.05)	0.11	110	420	-110	8.9	8.0
MW-67-185	SA	05/16/2019	N	LF	2,100	2,200	--	7,700	5.7	400	79	1.0	ND (0.5)	--	-22	6.9	5.0
MW-67-185	SA	12/04/2019	N	LF	3,100	2,900 J	--	6,800	23	270 J	76	0.35	30	850	88	7.8	35
MW-67-225	MA	05/16/2019	N	LF	3,100	3,300	--	7,000	48	93	26	3.4	2.9	--	-35	7.2	45
MW-67-225	MA	12/04/2019	N	LF	3,300	3,300	--	6,500	56	84	28	1.2	13	460	55	8.2	15
MW-67-260	DA	05/16/2019	N	LF	800	850	--	18,000	69	ND (2.5)	0.55	8.9	130	--	-54	8.4	1.0
MW-67-260	DA	12/04/2019	N	LF	390	360	--	17,000	74	1.2	0.54	7.0	19	ND (100)	-7.3	8.8	9.0
MW-68-180	SA	02/13/2019	N	LF	37,000	42,000	--	5,000	46	21	33	2.6	ND (0.5)	--	63	7.0	49
MW-68-180	SA	05/22/2019	N	LF	5,400	6,200	--	3,500	36	11	9.4	3.1	ND (0.5)	--	42	7.5	46
MW-68-180	SA	09/26/2019	N	LF	9,700	11,000	--	3,500	33	10	11	3.1	ND (0.5)	--	56	7.6	26
MW-68-180	SA	12/04/2019	N	LF	34,000	37,000	--	4,800	40	19	26	1.7	2.1	160	73	7.4	39
MW-68-240	DA	05/23/2019	N	LF	2,000	2,000	--	16,000	30	4.8	4.3	1.6	29	--	-60	6.9	15
MW-68-240	DA	05/23/2019	FD	--	1,900	2,100	--	16,000	31	4.7	4.3	1.7	29	--	--	--	--
MW-68-240	DA	12/04/2019	N	LF	2,100	1,900	--	16,000	22	4.1	4.5	1.8	18	ND (100)	13	7.5	8.0
MW-68BR-280	BR	05/22/2019	N	LF	ND (1.0)	ND (1.0)	--	20,000	40	ND (2.5)	ND (0.05)	1.2	150	--	-54	8.8	1.0
MW-68BR-280	BR	12/04/2019	N	LF	ND (1.0)	ND (1.0)	--	20,000	12	ND (2.5)	ND (0.05)	ND (0.5)	180	ND (100)	31	8.4	2.0

Table 3-1

Groundwater Sampling Results, 2019 Annual Reporting Period

Fourth Quarter 2019 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 Type	Sample Method	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)	Total Chromium (µg/L)	Specific Conductance (µS/cm)	Dissolved Molybdenum (µg/L)	Dissolved Selenium (µg/L)	Nitrate/Nitrite as Nitrogen (mg/L)	Dissolved Arsenic (µg/L)	Dissolved Manganese (µg/L)	Dissolved Iron (µg/L)	ORP (mV)	Field pH (SU)	Turbidity (NTU)
MW-69-195	BR	02/13/2019	N	LF	110	100	--	2,800	70	9.4	12	2.4	1.0	--	43	7.1	18
MW-69-195	BR	05/16/2019	N	LF	120	120	--	2,600	58	8.0	10	2.2	0.54	--	-18	7.2	19
MW-69-195	BR	09/26/2019	N	LF	78	77	--	2,600	65	8.0	9.3	2.5	ND (0.5)	--	16	7.8	25
MW-69-195	BR	12/03/2019	N	LF	180	150	--	3,000	61	9.4	13	2.5	ND (0.5)	180	75	7.4	32
MW-70-105	BR	05/21/2019	N	LF	170	170	--	3,500	66	4.6	4.9	3.7	6.0	--	48	7.8	10
MW-70-105	BR	12/17/2019	N	LF	60	55	--	2,800	110	2.1	1.8	3.7	13	ND (20)	32	7.9	35
MW-70BR-225	BR	05/21/2019	N	LF	1,600	1,700	--	13,000	20	2.8	3.5	2.0	1.1	--	120	7.4	1.0
MW-70BR-225	BR	12/17/2019	N	LF	1,300	1,200	--	12,000	18	2.5	3.1	1.8	8.2	ND (100)	60	7.7	8.0
MW-71-035	SA	05/23/2019	N	LF	ND (1.0)	ND (1.0)	--	14,000	13 J	0.52	0.085	1.2	18 J	--	66	7.2	15
MW-71-035	SA	12/18/2019	N	LF	ND (1.0)	ND (1.0)	--	14,000	15	ND (2.5)	0.051	ND (0.5)	510	270	60	7.4	16
MW-72-080	BR	02/11/2019	N	LF	77	92	--	16,000	83	1.2	0.74	11	48	--	-110	7.2	8.0
MW-72-080	BR	05/24/2019	N	LF	55	51	--	13,000	85	ND (2.5)	0.37	10	77	--	120	7.8	21
MW-72-080	BR	08/22/2019	N	LF	93	91	--	15,000	77	1.4	0.71	13	ND (0.5)	--	170	8.0	33
MW-72-080	BR	12/06/2019	N	LF	120	110	--	17,000	72	1.2	0.9	12	19	150	-260	7.7	5.0
MW-72BR-200	BR	02/12/2019	N	3V	5.3	5.4	--	14,000	85	ND (0.5)	0.13	16	43	--	-79	7.8	5.0
MW-72BR-200	BR	08/22/2019	N	LF	ND (1.0)	ND (1.0)	--	14,000	61	ND (0.5)	ND (0.05)	9.8	130	--	100	8.2	26
MW-72BR-200	BR	12/06/2019	N	LF	2.4	3.5	--	15,000	66	ND (0.5)	0.18	13	34	ND (100)	-140	8.0	8.0
MW-72BR-200_D	BR	02/12/2019	N	LF	ND (1.0)	ND (1.0)	--	14,000	82	ND (0.5)	ND (0.05)	11	140	--	-160	7.4	3.0
MW-72BR-200_S	BR	02/12/2019	N	LF	ND (1.0)	1.3	--	14,000	82	ND (0.5)	0.072	12	140	--	-150	7.3	11
MW-72BR-200_S	BR	05/23/2019	N	LF	ND (1.0)	ND (1.0)	--	15,000	76	ND (0.5)	ND (0.05)	13	210	--	-210	8.0	227
MW-73-080	BR	02/11/2019	N	LF	29	34 J	--	12,000	38	3.4	2.8	1.5	20	--	-71	7.0	14
MW-73-080	BR	05/23/2019	N	LF	34	35	--	12,000	30	4.3	3.3	1.8	5.7	--	25	7.5	8.0
MW-73-080	BR	08/22/2019	N	LF	20	18	--	11,000	29	3.2	2.9	1.7	ND (0.5)	--	130	7.6	45
MW-73-080	BR	12/06/2019	N	LF	19	19	--	9,100	37	3.5	4.4	0.54	12	ND (100)	77	7.4	14
MW-74-240	BR	05/22/2019	N	LF	0.55	ND (1.0)	--	800	19	2.4	2.1	8.3	4.5	--	-46	8.4	86
MW-74-240	BR	12/05/2019	N	LF	ND (0.2)	ND (1.0)	--	700	18	ND (0.5)	0.31	9.4	6.6	350	41	8.0	24
OW-03D	DA	12/19/2019	N	LF	13	12	--	9,700	22	0.55	--	--	ND (0.5)	ND (20)	15	8.0	2.0
OW-03M	MA	12/19/2019	N	LF	18	16	--	6,400	14	0.71	--	--	ND (0.5)	ND (20)	22	8.0	4.0
OW-03S	SA	12/19/2019	N	LF	29	28	--	1,400	10	5.6	--	--	2.7	82	68	7.8	5.0
PE-01	DA	01/03/2019	N	Tap	ND (0.2)	ND (1.0)	--	2,200	--	--	ND (0.05)	--	630	ND (20)	--	--	--
PE-01	DA	02/14/2019	N	Tap	ND (0.2)	ND (1.0)	--	2,200	--	--	ND (0.05)	--	500	ND (20)	--	--	--
PE-01	DA	03/05/2019	N	Tap	ND (0.2)	ND (1.0)	--	3,500	--	--	ND (0.05)	--	860	ND (20)	73	7.7	1.0
PE-01	DA	04/23/2019	N	Tap	ND (0.2)	ND (1.0)	--	1,900	--	--	ND (0.05)	--	510	ND (20)	180	7.1	2.0
PE-01	DA	05/09/2019	N	Tap	ND (0.2)	ND (1.0)	--	2,400	--	--	ND (0.05)	--	360	1,200	170	7.4	2.0
PE-01	DA	06/05/2019	N	Tap	ND (0.2)	ND (1.0)	--	2,000	--	--	ND (0.05)	--	460	430	-45	7.8	1.0
PE-01	DA	07/24/2019	N	Tap	ND (0.2)	ND (1.0)	--	3,300	--	--	ND (0.05)	--	450	ND (20)	130	7.2	2.0
PE-01	DA	08/07/2019	N	Tap	--	--	--	--	--	--	--	--	--	--	-11	7.5	1.0
PE-01	DA	08/22/2019	N	Tap	ND (0.2)	ND (1.0)	--	2,400	--	--	ND (0.05)	--	390	47	160	7.6	2.0
PE-01	DA	09/04/2019	N	Tap	0.69	ND (1.0)	--	2,200	--	--	ND (0.05)	--	410	150	63	7.4	--
PE-01	DA	10/03/2019	N	Tap	ND (0.2)	ND (1.0)	--	3,300	--	--	ND (0.05)	--	420	1,100	31	7.7	2.0
PE-01	DA	11/07/2019	N	Tap	ND (0.2)	ND (1.0)	--	3,600	--	--	ND (0.05)	--	510	570	-42	6.9	2.0
PE-01	DA	12/04/2019	N	Tap	ND (0.2)	ND (1.0)	--	4,700	--	--	0.16	--	520	7,500	180	7.6	4.0
PGE-07BR	BR	12/04/2019	N	LF	ND (1.0)	4.4	--	19,000	8.5	0.59	--	--	1,900	29,000	-300	7.4	33
PGE-08	BR	12/10/2019	N	3V	ND (1.0)	1.2	--	20,000	100	ND (0.5)	ND (0.05)	3.1	480	130	-98	8.3	1.0
PM-03	MA	12/16/2019	N	Tap	10	9.6	9.5	1,400	5.8	1.7	2.8	--	0.74	87	89	7.9	2.0
PM-04	MA	12/16/2019	N	Tap	17	16	16	2,400	5.3	1.3	2.2	--	ND (0.5)	26	59	8.0	2.0
TW-01	SA	05/24/2019	N	LF	2,300	2,400	--	7,000	15	14	15	--	--	--	150	7.2	1.0
TW-01	SA	12/03/2019	N	LF	2,200	2,100	--	8,000	15	13	15	--	ND (0.5)	ND (20)	-120	7.3	1.0
TW-02D	DA	02/14/2019	N	Tap	120	140	--	4,300	11	2.4	--	--	4.6 J	--	94	7.7	1.0
TW-02D	DA	02/14/2019	FD	--	120	130	--	4,200	11	2.2	--	--	11 J	--	--	--	--
TW-02D	DA	04/23/2019	N	Tap	93	46	--	4,600	10	2.0	--	--	27	--	190	7.2	2.0
TW-02D	DA	10/03/2019	N	Tap	95	110	--	5,500	11	2.3	--	--	ND (0.5)	--	46	7.5	3.0
TW-02D	DA	12/04/2019	N	Tap	2.3	52	--	4,900	14	1.1	--	--	210	770	200	7.8	12
TW-03D	DA	01/03/2019	N	Tap	500	480	--	7,800	--	--	2.7	--	16	ND (20)	--	--	--
TW-03D	DA	02/14/2019	N	Tap	420	520	--	7,600	--	--	2.8	--	18	ND (20)	--	--	--
TW-03D	DA	03/05/2019	N	Tap	500	520	--	7,400	--	--	2.9	--	21	ND (20)	76	7.7	2.0
TW-03D	DA	04/23/2019	N	Tap	470	480	--	7,400	--	--	2.5	--	18	ND (20)	140	7.2	2.0
TW-03D	DA	05/09/2019	N	Tap	460	440	--	7,100	--	--	2.7	--	21	ND (20)	190	7.2	2.0

Table 3-1

Groundwater Sampling Results, 2019 Annual Reporting Period

Fourth Quarter 2019 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 Type	Sample Method	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)	Total Chromium (µg/L)	Specific Conductance (µS/cm)	Dissolved Molybdenum (µg/L)	Dissolved Selenium (µg/L)	Nitrate/Nitrite as Nitrogen (mg/L)	Dissolved Arsenic (µg/L)	Dissolved Manganese (µg/L)	Dissolved Iron (µg/L)	ORP (mV)	Field pH (SU)	Turbidity (NTU)
TW-03D	DA	06/05/2019	N	Tap	450	440	--	7,500	--	--	2.6	--	18	ND (100)	110	7.8	1.0
TW-03D	DA	07/24/2019	N	Tap	450	430	--	7,200	--	--	2.7	--	ND (0.5)	ND (20)	70	7.7	3.0
TW-03D	DA	08/07/2019	N	Tap	--	--	--	--	--	--	--	--	--	--	7.9	7.2	1.0
TW-03D	DA	08/22/2019	N	Tap	410	430	--	6,900	--	--	2.6	--	ND (0.5)	ND (20)	120	7.7	3.0
TW-03D	DA	09/04/2019	N	Tap	500	450	--	7,200	--	--	2.7	--	ND (0.5)	ND (20)	62	7.3	1.0
TW-03D	DA	10/03/2019	N	Tap	410	430	--	7,100	--	--	2.8	--	ND (0.5)	ND (20)	62	7.8	3.0
TW-03D	DA	11/07/2019	N	Tap	440	430	--	6,800	--	--	2.8 J	--	ND (0.5)	ND (20)	92	7.3	1.0
TW-03D	DA	12/04/2019	N	Tap	480	480	--	7,200	--	--	2.8	--	ND (0.5)	ND (100)	200	7.6	2.0
TW-04	DA	05/16/2019	N	LF	5.1	4.5	--	20,000	42	ND (2.5)	--	--	16	--	140	7.5	1.0
TW-04	DA	12/12/2019	N	LF	5.8	5.6	--	21,000	89	ND (2.5)	--	--	82	ND (100)	290	7.2	1.0
TW-05	DA	05/20/2019	N	LF	11	9.9	--	12,000	31	0.59	--	--	3.1	--	21	7.6	7.0
TW-05	DA	05/20/2019	FD	--	11	9.6	--	12,000	30	0.52	--	--	3.0	--	--	--	--
TW-05	DA	12/12/2019	N	LF	18	17	--	15,000	24	1.1	--	--	4.9	ND (100)	140	7.2	1.0

Notes:

1. Beginning February 1, 2008, hexavalent chromium samples are field-filtered per DTSC-approved change from analysis Method SW7199 to E218.6.
2. The following analytical methods were used:
   Hexavalent chromium = USEPA Method 218.6
   Dissolved chromium, dissolved arsenic, dissolved iron, dissolved manganese, dissolved molybdenum, dissolved selenium = Method SW6020
   Specific conductance = USEPA Method 120.1
   Nitrate/Nitrate as Nitrogen = SM 4500-NO3 F
3. Monitoring well MW-60BR-245 was not sampled in Third Quarter 2019 due to access issues.
4. Monitoring well MW-54-195 was re-sampled in Third Quarter 2019 to verify the Second Quarter 2019 results.
5. Monitoring wells MW-57-050 and MW-58-065 were dry during the Fourth Quarter 2019 sampling event.
6. The pump at extraction well TW-02S was not functioning during Fourth Quarter 2019.
7. Monitoring locations sampled in Fourth Quarter 2019 are highlighted in grey.

-- = not applicable or not reportable.
µg/L = micrograms per liter.
µS/cm = microSiemens per centimeter.
BR = bedrock.
DA = deep interval of Alluvial Aquifer.
DTSC = Department of Toxic Substance Control.
FD = field duplicate.
G = Grab sample.
J = concentration or reporting limit (RL) estimated by laboratory or data validation.
LF = Low Flow (minimal drawdown).
mV = millivolts.
ND = not detected at listed reporting limit.
NTU = nephelometric turbidity units.
ORP = oxidation-reduction potential.
SA = shallow interval of Alluvial Aquifer.
SU = standard units.
Tap = sampled from tap of extraction well.
USEPA = United States Environmental Protection Agency.

Table 3-2

Title 22 Metals Groundwater Sampling Results, Fourth Quarter 2019

Fourth Quarter 2019 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 Type	Sample Method	Dissolved Antimony (µg/L)	Dissolved Arsenic (µg/L)	Dissolved Barium (µg/L)	Dissolved Beryllium (µg/L)	Dissolved Cadmium (µg/L)	Dissolved Cobalt (µg/L)	Dissolved Chromium (µg/L)	Dissolved Copper (µg/L)	Dissolved Lead (µg/L)	Dissolved Mercury (µg/L)	Dissolved Molybdenum (µg/L)	Dissolved Nickel (µg/L)	Dissolved Selenium (µg/L)	Dissolved Silver (µg/L)	Dissolved Thallium (µg/L)	Dissolved Vanadium (µg/L)	Dissolved Zinc (µg/L)
California MCL	**--**	**--**	**--**	**--**	**6**	**10**	**1,000**	**4**	**5**	**NE**	**50**	**1,000***	**15**	**2**	**NE**	**100**	**50**	**100***	**2**	**NE**	**5,000***
MW-10	SA	12/18/2019	N	LF	ND (0.5)	2.6	47	ND (0.5)	ND (0.5)	ND (0.5)	**230**	ND (1.0)	ND (1.0)	ND (0.2)	27	ND (1.0 J)	6.2	ND (0.5)	ND (0.5)	16 J	ND (10)
MW-12	SA	12/17/2019	N	LF	ND (0.5)	**43 J**	42	ND (0.5 J)	ND (0.5)	ND (0.5 J)	**1,800**	ND (1.0 J)	ND (5.0)	ND (0.2)	11	--	24 J	ND (0.5)	ND (2.5)	18	--
MW-14	SA	12/9/2019	N	LF	ND (0.5)	0.26	180 J	ND (2.5)	ND (0.5)	ND (0.5)	8.8	ND (1.0)	ND (1.0)	ND (0.2 J)	13 J	3.4	1.8	ND (0.5)	ND (0.5 J)	1.8	--
MW-22	SA	12/11/2019	N	LF	ND (2.5)	6.4	420	ND (2.5)	ND (2.5)	2.1	ND (1.0)	ND (5.0)	ND (5.0)	ND (0.2)	28	ND (5.0)	ND (2.5)	ND (2.5)	ND (2.5)	1.4	ND (50)
MW-22	SA	12/11/2019	FD	--	ND (2.5)	6.7	420	ND (0.5)	ND (2.5)	2.2	ND (1.0)	--	ND (5.0)	--	29	--	ND (2.5)	ND (2.5)	ND (2.5)	1.4	ND (50)
MW-24A	SA	12/3/2019	N	LF	ND (0.5)	ND (0.1)	22	ND (0.5)	ND (0.5)	ND (0.5)	1.8	ND (1.0)	ND (1.0)	ND (0.2)	120 J	ND (1.0)	ND (0.5)	ND (0.5)	ND (0.5)	ND (1.0)	ND (10)
MW-24B	DA	12/3/2019	N	LF	ND (2.5)	3.9	72	ND (0.5)	ND (2.5)	ND (0.5)	**220**	ND (1.0)	ND (5.0)	ND (0.2)	57	ND (1.0)	1.5	ND (2.5)	ND (2.5)	4.1	ND (10)
MW-24B	DA	12/3/2019	FD	--	ND (2.5)	3.8	69	ND (0.5)	ND (0.5)	ND (0.5)	**230**	ND (1.0)	ND (5.0)	ND (0.2)	57	ND (1.0)	1.8	ND (0.5)	ND (2.5)	3.8	ND (10)
MW-26	SA	12/12/2019	N	LF	ND (0.5)	1.0	35	ND (0.5)	ND (0.5)	ND (0.5)	**2,300**	ND (1.0)	ND (1.0)	ND (0.2)	31	ND (1.0)	35	ND (0.5)	ND (0.5)	7.3	ND (10)
MW-26	SA	12/12/2019	FD	--	ND (0.5)	1.1	34	ND (0.5)	ND (0.5)	ND (0.5)	**2,400**	ND (1.0)	ND (1.0)	--	31	ND (1.0)	35	ND (0.5)	ND (0.5)	7.1	ND (10)
MW-35-060	SA	12/13/2019	N	LF	ND (0.5)	ND (0.1)	69	ND (0.5 J)	ND (0.5)	ND (0.5 J)	21	ND (1.0)	ND (1.0)	ND (0.2)	10	ND (1.0 J)	1.1	ND (0.5)	ND (0.5)	2.7	ND (10 J)
MW-35-135	DA	12/13/2019	N	LF	ND (2.5)	0.95	40	ND (0.5)	ND (0.5)	ND (0.5)	25	ND (1.0)	ND (5.0)	ND (0.2)	22	3.3	1.0	ND (2.5)	ND (2.5)	1.4	ND (10)
MW-35-135	DA	12/13/2019	FD	--	ND (2.5)	0.89	40	ND (0.5)	ND (0.5)	ND (0.5)	24	ND (1.0)	ND (5.0)	ND (0.2)	23	3.4	1.0	ND (0.5)	ND (2.5)	1.4	ND (10)
MW-59-100	SA	12/13/2019	N	LF	ND (0.5)	2.0	76	ND (0.5)	ND (0.5)	ND (0.5)	**2,800**	1.7	ND (5.0)	ND (0.2)	5.3	ND (1.0)	2.4	ND (2.5)	ND (2.5)	ND (1.0)	ND (10)
MW-59-100	SA	12/13/2019	FD	--	ND (2.5)	2.1	74	ND (0.5)	ND (0.5)	ND (0.5)	**2,700**	1.5	ND (5.0)	ND (0.2)	5.1	ND (1.0)	2.4	ND (2.5)	ND (2.5)	ND (1.0)	ND (10)

Notes:

1. Title 22 metals are the metals listed in California Code of Regulations, Title 22, Section 66261.24(a)(2)(A).
2. Metals were analyzed by USEPA Methods SW6020 or SW7470A (mercury).
3. The MCLs listed are the California primary drinking water standards, except where noted. The MCLs are intended to apply to total fraction.
4. Bold values exceed the California MCLs.

* = Secondary USEPA MCL.
-- = not applicable or not reportable.
µg/L = micrograms per liter.
DA = deep interval of Alluvial Aquifer.
FD = field duplicate.
ID = identification.
J = concentration or reporting limit (RL) estimated by laboratory or data validation.
LF = Low Flow (minimal drawdown).
MCL = maximum contaminant level.
ND = not detected at listed reporting limit.
NE = not established.
SA = shallow interval of Alluvial Aquifer.
USEPA = United States Environmental Protection Agency.

Table 3-3

Surface Water Sampling Results, Fourth Quarter 2019

Fourth Quarter 2019 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	Sample Type	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)	Field pH (SU)	Specific Conductance (µS/cm)	Dissolved Molybdenum (µg/L)	Dissolved Selenium (µg/L)	Nitrate/Nitrite as Nitrogen (mg/L)	Dissolved Arsenic (µg/L)	Dissolved Iron (µg/L)	Iron (µg/L)	Dissolved Manganese (µg/L)	Dissolved Barium (µg/L)	Total Suspended Solids (mg/L)
C-BNS	2/12/2019	N	ND (0.2)	ND (1.0)	7.7	890	5.0	1.8	0.39	2.1	ND (20)	37	ND (0.5)	120	ND (5.0)
C-BNS	3/19/2019	N	ND (0.2)	ND (1.0)	7.8	820	5.2	1.4	0.42	2.2	ND (20)	ND (20)	ND (0.5)	110	ND (5.0)
C-BNS	6/18/2019	N	ND (0.2)	ND (1.0)	8.1	880	4.2	1.5	0.4	2.2	ND (20)	22	ND (0.5)	110	ND (5.0)
C-BNS	8/21/2019	N	ND (0.2)	ND (1.0)	8.2	920	4.4	1.3	0.35	2.2	ND (20)	ND (20)	ND (0.5)	120	ND (5.0)
C-BNS	11/20/2019	N	ND (0.2)	ND (1.0)	8.2	910	4.4 J	1.5	0.28	2.2	ND (20)	37	ND (0.5)	110	ND (5.0)
C-CON-D	2/13/2019	N	ND (0.2)	ND (1.0)	7.8	900	4.5	1.7	0.39	2.2	ND (20)	140 J	ND (0.5)	110	ND (5.0)
C-CON-D	3/20/2019	N	ND (0.2)	ND (1.0)	8.0	920	5.1	1.9	0.41	2.5	ND (20)	43	ND (0.5)	110	ND (5.0)
C-CON-D	3/20/2019	FD	ND (0.2)	ND (1.0)	--	900	4.9	1.6	0.41	2.1	ND (20)	55	ND (0.5)	100	ND (5.0)
C-CON-D	6/19/2019	N	ND (0.2)	ND (1.0)	8.1	920	4.2	1.6	0.38	2.3	ND (20)	45	ND (0.5)	100	ND (5.0)
C-CON-D	8/22/2019	N	ND (0.2)	ND (1.0)	8.1	870	4.5	1.6	0.36	2.4	ND (20)	ND (20)	ND (0.5)	110	ND (5.0)
C-CON-D	11/21/2019	N	ND (0.2)	ND (1.0)	8.1	890	4.8	1.6	0.25	2.2	ND (20)	440	ND (0.5)	120	32
C-CON-S	2/13/2019	N	ND (0.2)	ND (1.0)	7.7	900	5.0	1.8	7.2	2.2	ND (20)	36	ND (0.5)	110	ND (5.0)
C-CON-S	3/20/2019	N	ND (0.2)	ND (1.0)	8.2	910	4.9	1.6	0.4	2.3	ND (20)	67	ND (0.5)	110	ND (5.0)
C-CON-S	6/19/2019	N	ND (0.2)	ND (1.0)	8.1	910	4.2	1.4	0.37	2.2	ND (20)	36	ND (0.5)	100	ND (5.0)
C-CON-S	8/22/2019	N	ND (0.2)	ND (1.0)	8.2	860	4.8	1.6	0.36	2.4	ND (20)	ND (20)	ND (0.5)	120	ND (5.0)
C-CON-S	11/21/2019	N	ND (0.2)	ND (1.0)	8.2	900	4.6	1.7	0.26	2.1	ND (20)	100	ND (0.5)	120	26
C-CON-S	11/21/2019	FD	ND (0.2)	ND (1.0)	--	910	4.8	1.6	0.25	2.3	ND (20)	97	ND (0.5)	120	28
C-I-3-D	2/12/2019	N	ND (0.2)	ND (1.0)	7.8	870	4.8	2.1	0.35	2.1	ND (20)	23	ND (0.5)	110	ND (5.0)
C-I-3-D	3/19/2019	N	ND (0.2)	ND (1.0)	8.2	820	5.6	1.9	0.4	2.4	22	82	ND (0.5)	110	ND (5.0)
C-I-3-D	6/18/2019	N	ND (0.2)	ND (1.0)	8.0	880	4.4	1.6	0.36	2.3	ND (20)	150 J	ND (0.5)	110	ND (5.0)
C-I-3-D	6/18/2019	FD	ND (0.2)	ND (1.0)	--	890	4.3	1.4	0.37	2.2	ND (20)	25 J	ND (0.5)	110	ND (5.0)
C-I-3-D	8/21/2019	N	ND (0.2)	ND (1.0)	8.1	900	4.6	1.3	0.39	2.3	ND (20)	ND (20)	ND (0.5)	120	ND (5.0)
C-I-3-D	8/21/2019	FD	ND (0.2)	ND (1.0)	--	910	4.7	1.7	0.39	2.4	ND (20)	ND (20)	ND (0.5)	120	ND (5.0)
C-I-3-D	11/20/2019	N	ND (0.2)	ND (1.0)	8.2	910	4.4	1.4	0.26	2.2	ND (20)	76	ND (0.5)	110	ND (5.0)
C-I-3-S	2/12/2019	N	ND (0.2)	ND (1.0)	7.8	860	5.0	1.7	0.36	2.0	ND (20)	ND (20)	ND (0.5)	120	ND (5.0)
C-I-3-S	2/12/2019	FD	ND (0.2)	ND (1.0)	--	860	4.8	1.4	0.39	2.2	ND (20)	ND (20)	ND (0.5)	110	ND (5.0)
C-I-3-S	3/19/2019	N	ND (0.2)	ND (1.0)	8.1	810	5.2	2.1	0.41	2.2	ND (20)	ND (20)	ND (0.5)	110	ND (5.0)
C-I-3-S	3/19/2019	FD	ND (0.2)	ND (1.0)	--	810	5.6	2.4	0.4	2.2	ND (20)	ND (20)	ND (0.5)	120	ND (5.0)
C-I-3-S	6/18/2019	N	ND (0.2)	ND (1.0)	8.0	900	4.2	1.5	0.37	2.2	ND (20)	41	ND (0.5)	110	ND (5.0)
C-I-3-S	8/21/2019	N	ND (0.2)	ND (1.0)	8.1	910	4.5	1.7	0.35	2.4	ND (20)	ND (20)	ND (0.5)	120	ND (5.0)
C-I-3-S	11/20/2019	N	ND (0.2)	ND (1.0)	8.2	910	4.4	1.6	0.27	2.2	ND (20)	42	ND (0.5)	110	ND (5.0)
C-MAR-D	2/13/2019	N	ND (0.2)	ND (1.0)	7.1	910	4.9	2.0	0.36	2.3	57	340	2.9	110	30
C-MAR-D	3/20/2019	N	ND (0.2)	ND (1.0)	8.3	900	5.0	1.9	0.82	2.2	26	100	ND (0.5)	110	ND (5.0)
C-MAR-D	6/19/2019	N	ND (0.2)	ND (1.0)	8.1	910	4.2	1.8	0.36	2.3	44	200	ND (0.5)	110	7.0
C-MAR-D	8/22/2019	N	ND (0.2)	ND (1.0)	8.2	860	4.6	1.6	0.66	2.3	55	290	2.6	110	12
C-MAR-D	11/21/2019	N	ND (0.2)	ND (1.0)	7.9	1,100	5.4	1.3	0.3	2.4	75	2,000	17	130	88
C-MAR-S	2/13/2019	N	ND (0.2)	ND (1.0)	7.8	910	5.2	1.7	0.37	2.3	25	81	1.8	120	ND (5.0)
C-MAR-S	3/20/2019	N	ND (0.2)	ND (1.0)	8.4	910	4.5	1.7	0.39	2.2	ND (20)	150	ND (0.5)	100	8.5
C-MAR-S	6/19/2019	N	ND (0.2)	ND (1.0)	8.1	900	4.3	1.6	0.38	2.3	ND (20)	190	0.66	110	9.5
C-MAR-S	8/22/2019	N	ND (0.2)	ND (1.0)	8.2	860	4.5	1.6	0.36	2.3	ND (20)	220	5.5	110	12
C-MAR-S	11/21/2019	N	ND (0.2)	ND (1.0)	7.9	1,100	5.1	1.3	0.29	2.4	37 J	1,500 J	9.9	130	87
C-MAR-S	11/21/2019	FD	ND (0.2)	ND (1.0)	--	1,100	5.2	1.3	0.28	2.4	91 J	1,900 J	9.4	130	90
C-NR1-D	2/13/2019	N	ND (0.2)	ND (1.0)	7.9	900	5.0	1.7	0.39	2.2	24	170	ND (0.5)	120	ND (5.0)
C-NR1-D	3/20/2019	N	ND (0.2)	ND (1.0)	8.1	910	4.6	1.7	0.39	2.0	ND (20)	34	ND (0.5)	110	ND (5.0)
C-NR1-D	6/19/2019	N	ND (0.2)	ND (1.0)	8.1	910	4.1	1.7	0.37	2.3	ND (20)	49	ND (0.5)	100	ND (5.0)
C-NR1-D	8/22/2019	N	ND (0.2)	ND (1.0)	8.1	870	4.6	1.5	0.35	2.4	ND (20)	ND (20)	ND (0.5)	110	ND (5.0)
C-NR1-D	11/21/2019	N	ND (0.2)	ND (1.0)	8.2	900	4.9	1.8	0.27	2.3	23	200	ND (0.5)	120	27

Table 3-3

Surface Water Sampling Results, Fourth Quarter 2019

Fourth Quarter 2019 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	Sample Type	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)	Field pH (SU)	Specific Conductance (µS/cm)	Dissolved Molybdenum (µg/L)	Dissolved Selenium (µg/L)	Nitrate/Nitrite as Nitrogen (mg/L)	Dissolved Arsenic (µg/L)	Dissolved Iron (µg/L)	Iron (µg/L)	Dissolved Manganese (µg/L)	Dissolved Barium (µg/L)	Total Suspended Solids (mg/L)
C-NR1-S	2/13/2019	N	ND (0.2)	ND (1.0)	7.9	910	5.0	1.8	0.38	2.1	ND (20)	ND (20)	ND (0.5)	120	ND (5.0)
C-NR1-S	3/20/2019	N	ND (0.2)	ND (1.0)	--	910	4.7	2.3	0.39	2.1	ND (20)	110	ND (0.5)	110	ND (5.0)
C-NR1-S	6/19/2019	N	ND (0.2)	ND (1.0)	8.1	910	4.1	1.6	0.42	2.2	ND (20)	46	ND (0.5)	100	ND (5.0)
C-NR1-S	8/22/2019	N	ND (0.2)	ND (1.0)	8.2	870	4.7	1.6	0.34	2.4	ND (20)	ND (20)	ND (0.5)	120	ND (5.0)
C-NR1-S	11/21/2019	N	ND (0.2)	ND (1.0)	8.2	900	4.7	1.3	0.28	2.1	ND (20)	160	ND (0.5)	120	22
C-NR3-D	2/13/2019	N	ND (0.2)	ND (1.0)	7.9	920	4.8	1.7	0.37	2.1	ND (20)	37	ND (0.5)	120	ND (5.0)
C-NR3-D	3/20/2019	N	ND (0.2)	ND (1.0)	8.0	910	4.7	1.4	0.4	2.1	31	39	ND (0.5)	100	ND (5.0)
C-NR3-D	6/19/2019	N	ND (0.2)	ND (1.0)	8.1	910	4.2	1.5	0.38	2.1	ND (20)	39	ND (0.5)	110	ND (5.0)
C-NR3-D	8/22/2019	N	ND (0.2)	ND (1.0)	8.0	880	4.6	1.7	0.34	2.2	ND (20)	ND (20)	ND (0.5)	110	ND (5.0)
C-NR3-D	11/21/2019	N	ND (0.2)	ND (1.0)	8.2	900	4.5	1.5	0.3	2.0	35	150	ND (0.5)	110	20
C-NR3-S	2/13/2019	N	ND (0.2)	ND (1.0)	7.9	910	5.0	1.7	0.39	2.1	ND (20)	22	ND (0.5)	120	ND (5.0)
C-NR3-S	2/13/2019	FD	ND (0.2)	ND (1.0)	--	910	5.1	1.5	0.39	2.2	26	23	ND (0.5)	120	ND (5.0)
C-NR3-S	3/20/2019	N	ND (0.2)	ND (1.0)	8.0	910	4.8	1.4	0.4	2.2	23	26	ND (0.5)	110	ND (5.0)
C-NR3-S	6/19/2019	N	ND (0.2)	ND (1.0)	8.1	920	4.2	1.4	0.35	2.2	ND (20)	32	ND (0.5)	110	ND (5.0)
C-NR3-S	6/19/2019	FD	ND (0.2)	ND (1.0)	--	920	4.1	1.6	0.36	2.2	ND (20)	26	ND (0.5)	100	ND (5.0)
C-NR3-S	8/22/2019	N	ND (0.2)	ND (1.0)	8.1	870	4.6	1.4	0.34	2.2	ND (20)	ND (20)	ND (0.5)	110	ND (5.0)
C-NR3-S	11/21/2019	N	ND (0.2)	ND (1.0)	8.2	900	4.8	1.4	0.27	2.3	28	140	ND (0.5)	120	18
C-NR4-D	2/13/2019	N	ND (0.2)	ND (1.0)	7.9	910	5.0	1.5	0.41	2.0	ND (20)	22	ND (0.5)	120	ND (5.0)
C-NR4-D	3/20/2019	N	ND (0.2)	ND (1.0)	8.1	920	4.5	1.6	0.4	2.1	ND (20)	33	ND (0.5)	100	ND (5.0)
C-NR4-D	6/19/2019	N	ND (0.2)	ND (1.0)	8.2	930	4.1	1.4	0.36	2.2	ND (20)	ND (20)	ND (0.5)	100	ND (5.0)
C-NR4-D	8/22/2019	N	ND (0.2)	ND (1.0)	8.4	880	4.4	1.6	0.42	2.2	ND (20)	ND (20)	ND (0.5)	110	ND (5.0)
C-NR4-D	11/21/2019	N	ND (0.2)	ND (1.0)	8.1	900	4.8	1.8	0.27	2.3	49	140	ND (0.5)	120	20
C-NR4-S	2/13/2019	N	ND (0.2)	ND (1.0)	7.9	900	4.7	1.6	0.4	2.1	ND (20)	ND (20)	ND (0.5)	110	ND (5.0)
C-NR4-S	3/20/2019	N	ND (0.2)	ND (1.0)	8.0	920	4.7	1.6	0.4	2.3	ND (20)	26	ND (0.5)	100	ND (5.0)
C-NR4-S	6/19/2019	N	ND (0.2)	ND (1.0)	8.2	930	4.3	1.7	0.36	2.3	ND (20)	31	ND (0.5)	100	ND (5.0)
C-NR4-S	8/22/2019	N	ND (0.2)	ND (1.0)	8.2	880	4.4	1.5	0.34	2.3	ND (20)	91	ND (0.5)	110	ND (5.0)
C-NR4-S	11/21/2019	N	ND (0.2)	ND (1.0)	8.1	910	4.7	1.2	0.28	2.2	52	120	ND (0.5)	120	15
C-R22A-D	2/12/2019	N	ND (0.2)	ND (1.0)	7.8	880	4.8	1.5	0.34	2.1	26	42	ND (0.5)	120	ND (5.0)
C-R22A-D	3/19/2019	N	ND (0.2)	ND (1.0)	7.7	820	5.3	1.9	0.37	2.2	ND (20)	ND (20)	ND (0.5)	110	ND (5.0)
C-R22A-D	3/19/2019	FD	ND (0.2)	ND (1.0)	--	830	5.2	1.3	0.38	2.3	ND (20)	23	ND (0.5)	120	ND (5.0)
C-R22A-D	6/18/2019	N	ND (0.2)	ND (1.0)	8.1	890	4.1	1.6	0.38	2.2	ND (20)	85 J	ND (0.5)	110 J	ND (5.0)
C-R22A-D	8/21/2019	N	ND (0.2)	ND (1.0)	8.1	910	4.5	1.5	0.37	2.3	ND (20)	43	ND (0.5)	120	ND (5.0)
C-R22A-D	11/20/2019	N	ND (0.2)	ND (1.0)	8.2	920	4.4	1.7	0.24	2.2	23	60	ND (0.5)	110	ND (5.0)
C-R22A-D	11/20/2019	FD	ND (0.2)	ND (1.0)	--	920	4.6	1.4	0.27	2.2	ND (20)	89	ND (0.5)	110	ND (5.0)
C-R22A-S	2/12/2019	N	ND (0.2)	ND (1.0)	7.6	870	4.8	1.5	0.36	1.9	22	46	ND (0.5)	120	ND (5.0)
C-R22A-S	3/19/2019	N	ND (0.2)	ND (1.0)	7.8	820	5.4	1.7	0.41	2.4	ND (20)	20	ND (0.5)	120	ND (5.0)
C-R22A-S	6/18/2019	N	ND (0.2)	ND (1.0)	8.1	890	4.3	1.5	0.39	2.2	ND (20)	33	ND (0.5)	110	ND (5.0)
C-R22A-S	8/21/2019	N	ND (0.2)	ND (1.0)	8.2	920	4.5	1.5	0.34	2.3	ND (20)	27	ND (0.5)	120	ND (5.0)
C-R22A-S	11/20/2019	N	ND (0.2)	ND (1.0)	8.2	920	4.4	1.3	0.26	2.2	ND (20)	27	ND (0.5)	110	ND (5.0)
C-R27-D	2/12/2019	N	ND (0.2)	ND (1.0)	7.7	880	5.1	2.0	0.33	2.1	26	24	ND (0.5)	120	ND (5.0)
C-R27-D	3/19/2019	N	ND (0.2)	ND (1.0)	--	820	5.1	1.5	0.4	2.2	25	45	ND (0.5)	110	ND (5.0)
C-R27-D	6/18/2019	N	ND (0.2)	ND (1.0)	8.1	880	4.2	1.7	0.39	2.1	ND (20)	38	ND (0.5)	110	ND (5.0)
C-R27-D	8/21/2019	N	ND (0.2)	ND (1.0)	8.1	920	4.6	0.87 J	0.37	2.4	ND (20)	ND (20)	ND (0.5)	120	ND (5.0)
C-R27-D	8/21/2019	FD	ND (0.2)	ND (1.0)	--	920	4.8	1.9 J	0.35	2.4	ND (20)	23	ND (0.5)	120	ND (5.0)
C-R27-D	11/20/2019	N	ND (0.2)	ND (1.0)	8.2	910	4.6	1.3	0.23	2.1	ND (20)	ND (20)	ND (0.5)	110	ND (5.0)

Table 3-3

Surface Water Sampling Results, Fourth Quarter 2019

Fourth Quarter 2019 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	Sample Type	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)	Field pH (SU)	Specific Conductance (µS/cm)	Dissolved Molybdenum (µg/L)	Dissolved Selenium (µg/L)	Nitrate/Nitrite as Nitrogen (mg/L)	Dissolved Arsenic (µg/L)	Dissolved Iron (µg/L)	Iron (µg/L)	Dissolved Manganese (µg/L)	Dissolved Barium (µg/L)	Total Suspended Solids (mg/L)
C-R27-S	2/12/2019	N	ND (0.2)	ND (1.0)	7.7	900	5.0	1.6	0.33	2.1	ND (20)	63	ND (0.5)	120	ND (5.0)
C-R27-S	3/19/2019	N	ND (0.2)	ND (1.0)	7.7	820	4.8	1.8	0.36	2.2	ND (20)	25	ND (0.5)	110	ND (5.0)
C-R27-S	6/18/2019	N	ND (0.2)	ND (1.0)	8.1	880	4.4	1.6	0.41	2.2	ND (20)	24	ND (0.5)	110	ND (5.0)
C-R27-S	8/21/2019	N	ND (0.2)	ND (1.0)	8.2	920	4.4	1.7	0.37	2.3	ND (20)	ND (20)	ND (0.5)	120	ND (5.0)
C-R27-S	11/20/2019	N	ND (0.2)	ND (1.0)	8.2	920	4.9	1.6	0.31	2.1	ND (20)	30	ND (0.5)	110	ND (5.0)
C-TAZ-D	2/12/2019	N	ND (0.2)	ND (1.0)	7.7	860	5.4	2.1	0.35	2.3	21	22	ND (0.5)	120	ND (5.0)
C-TAZ-D	2/12/2019	FD	ND (0.2)	ND (1.0)	--	880	5.0	1.9	0.32	2.2	ND (20)	29	ND (0.5)	120	ND (5.0)
C-TAZ-D	3/19/2019	N	ND (0.2)	ND (1.0)	8.3	810	4.9	1.3	0.41	2.2	ND (20)	31	ND (0.5)	110	ND (5.0)
C-TAZ-D	6/18/2019	N	ND (0.2)	ND (1.0)	7.9	870	4.4	1.3	0.37	2.3	ND (20)	32	ND (0.5)	110	ND (5.0)
C-TAZ-D	8/21/2019	N	ND (0.2)	ND (1.0)	8.1	890	4.5	1.5	1.8	2.4	ND (20)	36 J	ND (0.5)	120	ND (5.0)
C-TAZ-D	11/20/2019	N	ND (0.2)	ND (1.0)	8.2	920	4.4	1.5	0.28	2.2	ND (20)	140	ND (0.5)	110	ND (5.0)
C-TAZ-S	2/12/2019	N	ND (0.2)	ND (1.0)	7.8	880	5.2	1.9	0.36	2.2	ND (20)	ND (20)	ND (0.5)	110	ND (5.0)
C-TAZ-S	3/19/2019	N	ND (0.2)	ND (1.0)	8.2	820	5.3	2.1	0.39	2.3	ND (20)	ND (20)	ND (0.5)	110	ND (5.0)
C-TAZ-S	6/18/2019	N	ND (0.2)	ND (1.0)	8.0	880	4.3	1.4	0.39	2.2	29	20	ND (0.5)	110	ND (5.0)
C-TAZ-S	8/21/2019	N	ND (0.2)	ND (1.0)	8.1	900	4.6	1.3	0.39	2.4	ND (20)	ND (20)	ND (0.5)	120	ND (5.0)
C-TAZ-S	11/20/2019	N	ND (0.2)	ND (1.0)	8.2	910	4.8	1.7	0.25	2.3	ND (20)	21	ND (0.5)	110	ND (5.0)
R-19	2/13/2019	N	ND (0.2)	ND (1.0)	7.9	910	5.0	1.8	0.39	2.1	ND (20)	36	ND (0.5)	120	ND (5.0)
R-19	3/20/2019	N	ND (0.2)	1.7	8.3	920	4.7	1.8	0.41	2.3	ND (20)	58	ND (0.5)	100	ND (5.0)
R-19	6/19/2019	N	ND (0.2)	ND (1.0)	7.9	920	4.2	1.5	0.34	2.1	24	27	ND (0.5)	100	ND (5.0)
R-19	6/19/2019	FD	ND (0.2)	ND (1.0)	--	920	4.1	1.6	0.37	2.2	ND (20)	31	ND (0.5)	100	ND (5.0)
R-19	8/22/2019	N	ND (0.2)	ND (1.0)	8.1	880	4.6	1.4	0.31	2.3	34	35	ND (0.5)	110	ND (5.0)
R-19	11/21/2019	N	ND (0.2)	ND (1.0)	8.1	880	4.7	1.7	0.26	2.2	1,800	1,800	1.5	120	72
R-28	2/12/2019	N	ND (0.2)	ND (1.0)	7.7	930	5.1	2.0	0.32	2.1	ND (20)	160	ND (0.5)	120	31
R-28	3/19/2019	N	ND (0.2)	ND (1.0)	7.9	820	5.3	2.0	0.38	2.1	ND (20)	ND (20)	ND (0.5)	110	ND (5.0)
R-28	6/18/2019	N	ND (0.2)	ND (1.0)	8.1	870	4.3	1.4	0.38	2.2	ND (20)	51	ND (0.5)	110	ND (5.0)
R-28	8/21/2019	N	ND (0.2)	ND (1.0)	8.1	920	4.4	1.2	0.33	2.1	ND (20)	ND (20)	ND (0.5)	120	ND (5.0)
R-28	11/20/2019	N	ND (0.2)	ND (1.0)	8.1	920	5.1	1.8	0.28	2.1	ND (20)	67 J	ND (0.5)	110	ND (5.0)
R-63	2/12/2019	N	ND (0.2)	ND (1.0)	7.9	870	5.0	1.1	0.35	2.1	ND (20)	25	ND (0.5)	120	ND (5.0)
R-63	3/19/2019	N	ND (0.2)	ND (1.0)	8.0	820	5.1	1.9	0.36	2.2	ND (20)	ND (20)	ND (0.5)	110	ND (5.0)
R-63	6/18/2019	N	ND (0.2)	ND (1.0)	8.1	860	4.4	1.6	0.35	2.4	ND (20)	21	ND (0.5)	110	ND (5.0)
R-63	8/21/2019	N	ND (0.2)	ND (1.0)	8.2	910	4.5	1.7	0.38	2.3	ND (20)	33	ND (0.5)	120	ND (5.0)
R-63	11/20/2019	N	ND (0.2)	ND (1.0)	8.2	920	4.3	1.6	0.28	2.2	ND (20)	40	ND (0.5)	110	16
RRB	2/13/2019	N	ND (0.2)	ND (1.0)	7.9	930	5.3	1.8	0.33	2.2	22	24	1.9	120	ND (5.0)
RRB	3/20/2019	N	ND (0.2)	ND (1.0)	8.1	940	4.4	1.4	0.36	2.2	ND (20)	44	ND (0.5)	100	ND (5.0)
RRB	6/19/2019	N	ND (0.2)	ND (1.0)	8.1	920	4.3	1.7	0.35	2.3	ND (20)	50	ND (0.5)	100	ND (5.0)
RRB	8/22/2019	N	ND (0.2)	ND (1.0)	8.0	900	4.5	1.6	0.32	2.3	ND (20)	35	13	120	ND (5.0)
RRB	11/21/2019	N	ND (0.2)	ND (1.0)	7.9	3,200	6.3	1.5	0.3	2.4	210	180	590	300	34
SW-1	2/12/2019	N	ND (0.2)	ND (1.0)	7.7	960	--	--	--	--	--	--	--	--	--
SW-1	3/19/2019	N	ND (0.2)	ND (1.0)	8.0	920	--	--	--	--	--	--	--	--	--
SW-1	6/18/2019	N	ND (0.2)	ND (1.0)	7.8	950	--	--	--	--	--	--	--	--	--
SW-1	8/21/2019	N	ND (0.2)	ND (1.0)	8.0	950	--	--	--	--	--	--	--	--	--
SW-1	11/21/2019	N	ND (0.2)	ND (1.0)	7.9	900	--	--	--	--	--	--	--	--	--

Table 3-3

Surface Water Sampling Results, Fourth Quarter 2019

Fourth Quarter 2019 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	Sample Type	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)	Field pH (SU)	Specific Conductance (µS/cm)	Dissolved Molybdenum (µg/L)	Dissolved Selenium (µg/L)	Nitrate/Nitrite as Nitrogen (mg/L)	Dissolved Arsenic (µg/L)	Dissolved Iron (µg/L)	Iron (µg/L)	Dissolved Manganese (µg/L)	Dissolved Barium (µg/L)	Total Suspended Solids (mg/L)
SW-2	2/12/2019	N	ND (0.2)	ND (1.0)	7.5	960	--	--	--	--	--	--	--	--	--
SW-2	3/19/2019	N	ND (0.2)	ND (1.0)	8.0	890	--	--	--	--	--	--	--	--	--
SW-2	6/18/2019	N	ND (0.2)	ND (1.0)	7.7	940	--	--	--	--	--	--	--	--	--
SW-2	8/21/2019	N	ND (0.2)	ND (1.0)	8.0	960	--	--	--	--	--	--	--	--	--
SW-2	11/21/2019	N	ND (0.2)	ND (1.0)	7.7	960	--	--	--	--	--	--	--	--	--

Notes:

1. Beginning February 1, 2008, hexavalent chromium samples are field-filtered per DTSC-approved change from analysis Method SW7199 to E218.6.
2. The following analytical methods were used:
   Hexavalent chromium = USEPA 218.6
   Dissolved chromium, dissolved arsenic, dissolved barium, dissolved selenium = SW6020
   Dissolved iron, total iron, dissolved manganese, dissolved molybdenum = SW6010B
   Specific conductance = USEPA 120.1
   Nitrate/Nitrate as Nitrogen = SM 4500-NO3 F
   Total suspended solids = SM 2540D
3. Monitoring locations sampled in Fourth Quarter 2019 are highlighted in grey.

-- = not applicable.
µg/L = micrograms per liter.
µS/cm = microSiemens per centimeter.
DTSC = Department of Toxic Substance Control.
FD = field duplicate.
ID = identification.
J = concentration or reporting limit (RL) estimated by laboratory or data validation.
mg/L = milligrams per liter.
ND = not detected at listed reporting limit.
SU = standard units.
USEPA = United States Environmental Protection Agency.

Table 4-1

Sampling Method Trial Results through Fourth Quarter 2019

Fourth Quarter 2019 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report

PG&E Topock Compressor Station, Needles, California

Sampling Date	Sampling Method	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)
12/14/2017	3V	690	830
12/13/2017	LF - 175 ft	2.3	12
	Control Limit/RPD	**344 - 348**	**194%**
12/14/2017	3V	690	830
12/13/2017	LF - 238 ft	ND (1)	1.4
	Control Limit	**344 - 348**	**414 - 418**
2/21/2018	3V	69	59
2/21/2018	LF - 175 ft	ND (1)	7.7
	Control Limit/RPD	**33 - 37**	**154%**
2/21/2018	3V	69	59
2/21/2018	LF - 238 ft	4.1	39
	Control Limit/RPD	**35 - 39**	**41%**
5/2/2018	3V	73	67
5/2/2018	LF - 175 ft	1.1	1.5
	Control Limit	**35 - 39**	**32 - 36**
5/2/2018	3V	73	67
5/2/2018	LF - 238 ft	1.2	1.7
	Control Limit	**35 - 39**	**32 - 36**
9/25/2018	3V	76	81
9/25/2018	LF - 175 ft	ND (1)	ND (1)
	Control Limit	**37 - 41**	**39 - 43**
9/25/2018	3V	76	81
9/25/2018	LF - 238 ft	6.4	6.2
	RPD	**169%**	**172%**
12/6/2018	3V	110	120
12/6/2018	LF - 175 ft	17	17
	RPD	**146%**	**150%**
12/6/2018	3V	110	120
12/6/2018	LF - 238 ft	20	21
	RPD	**138%**	**140%**
2/14/2019	3V	110	110
2/14/2019	LF - 175 ft	25	29
	RPD	**126%**	**117%**
2/14/2019	3V	110	110
2/14/2019	LF - 238 ft	18	17
	RPD	**144%**	**146%**

Table 4-1

Sampling Method Trial Results through Fourth Quarter 2019

Fourth Quarter 2019 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report

PG&E Topock Compressor Station, Needles, California

Sampling Date	Sampling Method	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)
5/22/2019	3V	130	120
5/23/2019	LF - 175 ft	85	74
	RPD	**42%**	**47%**
5/22/2019	3V	130	120
5/23/2019	LF - 238 ft	68	61
	RPD	**63%**	**65%**
12/12/2019	3V	64	52
12/13/2019	LF - 175 ft	86	76
	RPD	**29%**	**38%**
12/12/2019	3V	64	52
12/13/2019	LF - 238 ft	75	61
	RPD	16%	16%

Notes:

1. Results presented in table are for monitoring well MW-60BR-245.
2. During the December 2017 through February 2019 sampling method trials, groundwater samples were collected using the LF method first followed by the 3V method. In May and December 2019, groundwater samples were collected using the 3V method first followed by the LF method.
3. **Bold underlined** values highlighted in green are above a 20% threshold for RPD evaluation or outside the control limit. If the concentration of either sample result within a sample pair is less than or equal to 5 times the reporting limit, then a control limit of two times the reporting limit is applied. For consistency purposes, a reporting limit of 1 µg/L was used for hexavalent chromium and dissolved chromium results.

µg/L = micrograms per liter.
3V = three volume purge.
ft = feet.
ID = identification.
J = concentration estimated by laboratory or data validation.
LF = low-flow.
ND = not detected at the listed reporting limit.
RPD = relative percent difference.

Table 5-1

Pumping Rate and Extracted Volume for IM-3 System, Fourth Quarter 2019

Fourth Quarter 2019 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 2019 Average Pumping Rate[a] (gpm)	November 2019 Volume Pumped (gal)	December 2019 Average Pumping Rate[a] (gpm)	December 2019 Volume Pumped (gal)	Fourth Quarter 2019 Average Pumping Rate[a] (gpm)	Fourth Quarter 2019 Volume Pumped (gal)	Annual 2019 Average Pumping Rate[a] (gpm)	Annual 2019 Volume Pumped (gal)
TW-02S	0.00	0	0.00	0	0.00	0	0.00	0
TW-02D	0.00	0	0.00	0	0.00	0	0.00	56
TW-03D	129.74	5,604,878	126.92	5,665,901	128.33	11,270,779	126.80	66,639,103
PE-01	0.02	712	0.01	262	0.01	974	0.01	3,613
TOTAL	**129.8**	**5,605,590**	**126.9**	**5,666,162**	**128.3**	**11,271,753**	**126.8**	**66,642,772**

Chromium Removed This Quarter (kg)	39.1
Chromium Removed This Year (kg)	126
Chromium Removed Project to Date (kg)	4,380
Chromium Removed This Quarter (lb)	86.1
Chromium Removed This Year (lb)	278
Chromium Removed Project to Date (lb)	9,660

Notes:

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

1. Chromium removed includes the period of October 1, 2019 through December 31, 2019.

gal = gallons.

gpm = gallons per minute.

ID = identification.

IM = Interim Measure.

kg = kilograms.

lb = pounds.

Table 5-2

Wells Monitored for Conditional Shutdown of PE-01, 2019 Annual Reporting Period

Fourth Quarter 2019 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	Q4 2019 Sample Date	Q4 2019 Sample Method	Hexavalent Chromium 2014 Maximum Concentration (µg/L)	Hexavalent Chromium Q1 2019 Result (µg/L)	Hexavalent Chromium Q2 2019 Result (µg/L)	Hexavalent Chromium Q3 2019 Result (µg/L)	Hexavalent Chromium Q4 2019 Result (µg/L)	Dissolved Chromium 2014 Maximum Concentration (µg/L)	Dissolved Chromium Q1 2019 Result (µg/L)	Dissolved Chromium Q2 2019 Result (µg/L)	Dissolved Chromium Q3 2019 Result (µg/L)	Dissolved Chromium Q4 2019 Result (µg/L)	Q4 2019 Result Exceeded 2014 Maximum Concentration?
MW-20-070	Shallow	12/13/2019	LF	2,200	NS	1,700	NS	**2,300**	2,400	NS	1,800	NS	2,200	**Yes**
MW-26	Shallow	12/12/2019	LF	2,400	NS	2,300	NS	2,300	2,300	NS	**2,500**	NS	**2,400**	**Yes**
MW-27-020	Shallow	12/10/2019	LF	ND (0.20)	NS	NS	NS	ND (0.2)	ND (1.0)	NS	NS	NS	**1.1**	**Yes**
MW-28-025	Shallow	12/09/2019	LF	ND (0.20)	NS	ND (0.2)	NS	ND (0.2)	ND (1.0)	NS	ND (1.0)	NS	ND (1.0)	No
MW-30-030	Shallow	12/05/2019	LF	0.21	NS	NS	NS	ND (1.0)	ND (1.0)	NS	NS	NS	ND (1.0)	No
MW-31-060	Shallow	12/12/2019	LF	600	NS	250	NS	370	660	NS	240	NS	370	No
MW-32-020	Shallow	12/09/2019	LF	ND (1.0)	NS	NS	NS	ND (1.0)	ND (5.0)	NS	NS	NS	ND (1.0)	No
MW-32-035	Shallow	12/09/2019	LF	ND (1.0)	NS	ND (0.2)	NS	ND (1.0)	ND (1.0)	NS	ND (1.0)	NS	ND (1.0)	No
MW-33-040	Shallow	12/05/2019	LF	0.28	NS	ND (0.2)	NS	ND (1.0)	ND (1.0)	NS	ND (1.0)	NS	ND (1.0)	No
MW-36-020	Shallow	12/04/2019	LF	ND (0.20)	NS	NS	NS	ND (0.2)	ND (1.0)	NS	NS	NS	ND (1.0)	No
MW-36-040	Shallow	12/04/2019	LF	0.34	NS	NS	NS	ND (0.2)	ND (1.0)	NS	NS	NS	ND (1.0)	No
MW-39-040	Shallow	12/05/2019	LF	ND (0.20)	NS	NS	NS	ND (0.2)	ND (1.0)	NS	NS	NS	ND (1.0)	No
MW-42-030	Shallow	12/11/2019	LF	0.54	NS	NS	NS	ND (1.0)	ND (1.0)	NS	NS	NS	ND (1.0)	No
MW-47-055	Shallow	12/04/2019	LF	16	NS	**17**	NS	**21**	16	NS	15	NS	**18**	**Yes**
MW-20-100	Middle	12/13/2019	LF	2,900	NS	1,300	NS	750	2,900	NS	1,500	NS	780	No
MW-27-060	Middle	12/10/2019	LF	ND (0.20)	NS	NS	NS	ND (0.2)	ND (1.0)	NS	NS	NS	ND (1.0)	No
MW-30-050	Middle	12/05/2019	LF	ND (0.20)	NS	NS	NS	ND (0.2)	ND (1.0)	NS	NS	NS	ND (1.0)	No
MW-33-090	Middle	12/05/2019	LF	13.3	NS	2.5	NS	2.8	15.5	NS	5.5	NS	3.9	No
MW-34-055	Middle	12/10/2019	LF	ND (0.20)	NS	NS	NS	ND (0.2)	ND (1.0)	NS	NS	NS	ND (1.0)	No
MW-36-050	Middle	12/04/2019	LF	ND (0.20)	NS	NS	NS	ND (0.2)	ND (1.0)	NS	NS	NS	ND (1.0)	No
MW-36-070	Middle	12/04/2019	LF	ND (0.20)	NS	NS	NS	ND (0.2)	ND (1.0)	NS	NS	NS	ND (1.0)	No
MW-39-050	Middle	12/05/2019	LF	ND (0.20)	NS	NS	NS	ND (0.2)	ND (1.0)	NS	NS	NS	ND (1.0)	No
MW-39-060	Middle	12/05/2019	LF	ND (0.20)	NS	NS	NS	ND (0.2)	ND (1.0)	NS	NS	NS	ND (1.0)	No
MW-39-070	Middle	12/05/2019	LF	ND (0.20)	NS	NS	NS	ND (0.2)	ND (1.0)	NS	NS	NS	ND (1.0)	No
MW-42-055	Middle	12/11/2019	LF	0.35	NS	ND (0.2)	NS	ND (0.2)	2.8	NS	ND (1.0)	NS	ND (1.0)	No
MW-42-065	Middle	12/11/2019	LF	ND (0.20)	NS	ND (0.2)	NS	ND (0.2)	ND (1.0)	NS	ND (1.0)	NS	ND (1.0)	No
MW-44-070	Middle	12/11/2019	LF	ND (0.20)	NS	ND (0.2)	NS	ND (0.2)	ND (1.0)	NS	ND (1.0)	NS	ND (1.0)	No
MW-51	Middle	12/12/2019	LF	4,800	NS	3,300	NS	3,600	4,800	NS	3,800	NS	4,000	No
MW-20-130	Deep	12/13/2019	LF	9,100	NS	6,000	NS	5,900	9,000	NS	6,800	NS	6,000	No
MW-27-085	Deep	12/10/2019	LF	ND (1.0)	NS	ND (0.2)	NS	ND (0.2)	ND (1.0)	NS	ND (1.0)	NS	ND (1.0)	No
MW-28-090	Deep	12/09/2019	LF	ND (0.20)	NS	ND (0.2)	NS	ND (0.2)	ND (1.0)	NS	ND (1.0)	NS	ND (1.0)	No
MW-31-135	Deep	12/12/2019	LF	12	NS	NS	NS	**13**	12	NS	NS	NS	**14**	**Yes**
MW-33-150	Deep	12/05/2019	LF	12	NS	5.5	NS	2.0	10.8	NS	**21**	NS	7.7	No
MW-33-210	Deep	12/05/2019	LF	13	NS	10	NS	13	13.5	NS	9.2	NS	**15**	**Yes**
MW-34-080	Deep	12/10/2019	LF	ND (0.20)	NS	ND (0.2)	NS	ND (0.2)	ND (1.0)	NS	ND (1.0)	NS	ND (1.0)	No
MW-34-100	Deep	12/10/2019	LF	263	ND (1.0)	ND (0.2)	ND (0.2)	ND (1.0)	270	1.7	ND (1.0)	ND (1.0)	1.9	No
MW-36-090	Deep	12/04/2019	LF	ND (0.20)	NS	ND (0.2)	NS	ND (0.2)	ND (1.0)	NS	ND (1.0)	NS	ND (1.0)	No
MW-36-100	Deep	12/04/2019	LF	65	NS	7.4	NS	7.5	62	NS	11	NS	9.8	No
MW-39-080	Deep	12/05/2019	LF	ND (0.20)	NS	NS	NS	**0.52**	ND (1.0)	NS	NS	NS	**2.5**	**Yes**
MW-39-100	Deep	12/05/2019	LF	57	NS	**88**	NS	**87**	49	NS	**89**	NS	**82**	**Yes**
MW-44-115	Deep	12/11/2019	LF	41.6	9.7	6.0	6.2	6.7	42.9	17	6.1	6.3	7.3	No
MW-44-125	Deep	12/11/2019	LF	4.0 J	NS	1.9	NS	2.6	5.9	NS	**10**	NS	3.8	No
MW-45-095a	Deep	--	--	13.7*	NS	NS	NS	NS	14.2*	NS	NS	NS	NS	--
MW-46-175	Deep	12/04/2019	LF	46.3	8.1	7.6	6.0	5.1	46.1	20	9.1	6.1	6.3	No
MW-46-205	Deep	12/04/2019	LF	5.5	NS	2.4	NS	ND (1.0)	4.8	NS	2.7	NS	**6.2**	**Yes**
MW-47-115	Deep	12/04/2019	LF	24	NS	**27**	NS	16	20	NS	**23**	NS	**22**	**Yes**
PE-01	Deep	--	Tap	5.6	--	--	ND (0.2)	--	6	--	--	ND (1.0)	--	
PE-01	Deep	--	Tap	5.6	ND (0.2)	ND (0.2)	ND (0.2)	--	6	ND (1.0)	ND (1.0)	ND (1.0)	--	
PE-01	Deep	11/07/2019	Tap	5.6	ND (0.2)	ND (0.2)	0.69	ND (0.2)	6	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	No
PE-01	Deep	12/04/2019	Tap	5.6	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	6	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	No
TW-04	Deep	12/12/2019	LF	7.4*	NS	5.1	NS	5.8	20	NS	4.5	NS	5.6	No

Table 5-2
Wells Monitored for Conditional Shutdown of PE-01, 2019 Annual Reporting Period
Fourth Quarter 2019 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report
PG&E Topock Compressor Station, Needles, California

Notes:
1. Monitoring wells presented in the table are located within approximately 800 feet of TW-03D, as stated in DTSC 2015.
2. * = Result is the maximum concentration from 2013.
3. Values shown in parentheses are the reporting limit.
4. If a field duplicate sample was collected, the maximum concentration between the primary and field duplicate sample is presented.
5. On June 27, 2014, DTSC approved discontinuation of groundwater sampling at monitoring well MW-45-095a.
6. **Bold** values exceeded the 2013 and/or 2014 maximum concentration for hexavalent chromium and/or dissolved chromium.
7. Monitoring results from Fourth Quarter 2019 are highlighted in grey.

-- = not applicable.
µg/L = micrograms per liter.
DTSC = Department of Toxic Substance Control.
ID = identification.
LF = low flow (minimal drawdown).
ND = not detected at listed reporting limit.
NS = not sampled.
Q1 = first quarter.
Q2 = second quarter.
Q3 = third quarter.
Q4 = fourth quarter.
Tap = sampled from tap of extraction well.

References:

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.

Table 5-3

Groundwater Elevation Results, Fourth Quarter 2019

Fourth Quarter 2019 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	November Average Groundwater Elevation (ft amsl)	December Average Groundwater Elevation (ft amsl)	Quarterly Average Groundwater Elevation (ft amsl)	Days in Quarterly Average
MW-20-070	Shallow	452.20	451.72	451.96	61
MW-22	Shallow	454.16	453.09	453.62	61
MW-25	Shallow	454.72	453.93	454.32	61
MW-26	Shallow	454.40	453.74	454.06	61
MW-27-020	Shallow	453.67	452.33	452.99	61
MW-28-025	Shallow	453.56	452.34	452.94	61
MW-31-060	Shallow	453.37	452.45	452.90	61
MW-32-035	Shallow	453.55	452.38	452.95	61
MW-33-040	Shallow	453.81	452.58	453.18	61
MW-35-060	Shallow	453.48	452.90	453.18	61
MW-36-020	Shallow	453.40	452.29	452.84	61
MW-36-040	Shallow	453.45	452.03	452.73	61
MW-39-040	Shallow	453.33	451.96	452.63	61
MW-42-030	Shallow	453.24	452.19	452.71	61
MW-43-025	Shallow	453.51	INC	INC	33
MW-47-055	Shallow	454.19	453.36	453.72	54
MW-20-100	Middle	451.36	450.90	451.13	61
MW-27-060	Middle	453.60	452.41	453.00	61
MW-30-050	Middle	453.24	452.04	452.64	61
MW-33-090	Middle	453.82	452.62	453.21	61
MW-34-055	Middle	453.40	452.23	452.74	55
MW-36-050	Middle	453.27	452.12	452.69	61
MW-36-070	Middle	453.27	452.13	452.70	61
MW-39-050	Middle	453.14	452.06	452.59	61
MW-39-060	Middle	452.87	451.78	452.32	61
MW-39-070	Middle	452.44	451.46	451.94	61
MW-42-065	Middle	453.34	452.29	452.81	61
MW-44-070	Middle	453.36	452.18	452.76	61
MW-50-095	Middle	453.96	453.07	453.51	61
MW-51	Middle	453.90	453.32	453.56	54
MW-55-045	Middle	455.35	454.99	455.17	61
MW-20-130	Deep	450.48	449.97	450.22	61
MW-27-085	Deep	453.52	452.30	452.90	61
MW-28-090	Deep	453.46	452.23	452.83	61
MW-31-135	Deep	452.24	451.76	452.00	61
MW-33-150	Deep	454.04	452.91	453.46	61
MW-34-080	Deep	453.84	452.59	453.20	61
MW-34-100	Deep	453.73	452.50	453.10	61
MW-35-135	Deep	453.15	452.52	452.83	61
MW-36-090	Deep	453.91	451.98	452.93	61
MW-36-100	Deep	453.10	452.04	452.56	61
MW-39-080	Deep	452.45	451.44	451.94	61
MW-39-100	Deep	453.01	452.05	452.52	61
MW-43-090	Deep	453.33	452.09	452.70	61
MW-44-115	Deep	453.05	452.23	452.63	61
MW-44-125	Deep	453.49	452.41	452.94	61
MW-45-095a	Deep	453.21	452.10	452.64	61
MW-46-175	Deep	453.87	452.80	453.33	61
MW-47-115	Deep	453.73	452.80	453.26	61
MW-49-135	Deep	454.12	453.12	453.61	61
MW-54-085	Deep	453.73	452.45	453.08	61
MW-54-140	Deep	453.66	452.76	453.20	61
MW-54-195	Deep	454.02	453.37	453.69	61
MW-55-120	Deep	455.89	455.21	455.54	61
PT-2D	Deep	451.95	450.96	451.45	61
PT-5D	Deep	452.93	451.93	452.42	61
PT-6D	Deep	452.88	451.90	452.38	61
I-3	Surface water	453.89	452.61	453.24	61
RRB	Surface water	INC	INC	INC	0

Notes:

ft amsl = feet above mean sea level.

INC = data are incomplete; less than 75 percent of data were available during the reporting period due to rejection, field equipment malfunction, or inaccessibility.

ID = identification.

Table 5-4

Average Hydraulic Gradients Measured at Well Pairs, Fourth Quarter 2019

Fourth Quarter 2019 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report

PG&E Topock Compressor Station, Needles, California

Gradient Pair	Well Pair	Reporting Period	Mean Landward Hydraulic Gradient (feet/foot)	Days in Monthly Average	PE-01 Run for Gradient Control?
Overall Average	--	November	0.0046	--	No
Overall Average	--	December	0.0034	--	No
Northern Gradient Pair	MW-31-135 / MW-33-150	November	0.0038	30	No
Northern Gradient Pair	MW-31-135 / MW-33-150	December	0.0024	31	No
Central Gradient Pair (used when PE-01 is run for gradient control)	MW-45-095 / MW-34-100	November	--	--	--
Central Gradient Pair (used when PE-01 is run for gradient control)	MW-45-095 / MW-34-100	December	--	--	--
Central Gradient Pair (used when PE-01 is not run for gradient control)	MW-20-130 / MW-34-100	November	0.0057	30	No
Central Gradient Pair (used when PE-01 is not run for gradient control)	MW-20-130 / MW-34-100	December	0.0044	31	No
Southern Gradient Pair (used when PE-01 is run for gradient control)	MW-45-095 / MW-27-085	November	--	--	--
Southern Gradient Pair (used when PE-01 is run for gradient control)	MW-45-095 / MW-27-085	December	--	--	--
Southern Gradient Pair (used when PE-01 is not run for gradient control)	MW-20-130 / MW-27-085	November	0.0044	30	No
Southern Gradient Pair (used when PE-01 is not run for gradient control)	MW-20-130 / MW-27-085	December	0.0034	31	No

Notes:

1. The target mean landward hydraulic gradient for the selected well pairs is 0.001 feet/foot.
2. "Days in Monthly Average" refers to the number of days the pressure transducers in both wells were operating correctly.
3. Beginning in August 2017, MW-20-130 was approved for gradient compliance (instead of MW-45-95) at the central and southern well pairs during months when PE-01 is not run for gradient control.
4. MW-45-095 is also known as MW-45-095a.

-- = not applicable

Table 5-5

Interim Measure Contingency Plan Trigger Levels and Results, 2019 Annual Reporting Period

Fourth Quarter 2019 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	Q4 2019 Sample Date	Q4 2019 Sample Method	Hexavalent Chromium Trigger Level (µg/L)	Q1 2019 Hexavalent Chromium Result (µg/L)	Q2 2019 Hexavalent Chromium Result (µg/L)	Q3 2019 Hexavalent Chromium Result (µg/L)	Q4 2019 Hexavalent Chromium Result (µg/L)	Q4 2019 Result Exceeded Trigger Level?
MW-21	Shallow	12/13/2019	LF	20	NS	6.5	NS	ND (1.0)	No
MW-27-085	Deep	12/10/2019	LF	20	NS	ND (0.2)	NS	ND (0.2)	No
MW-28-090	Deep	12/9/2019	LF	20	NS	ND (0.2)	NS	ND (0.2)	No
MW-32-020	Shallow	12/9/2019	LF	20	NS	NS	NS	ND (1.0)	No
MW-32-035	Shallow	12/9/2019	LF	20	NS	ND (0.2)	NS	ND (1.0)	No
MW-33-040	Shallow	12/5/2019	LF	20	NS	ND (0.2)	NS	ND (1.0)	No
MW-33-090	Middle	12/5/2019	LF	25	NS	2.5	NS	2.8	No
MW-33-150	Deep	12/5/2019	LF	20	NS	5.5	NS	2	No
MW-33-210	Deep	12/5/2019	LF	20	NS	10	NS	13	No
MW-34-080	Deep	12/10/2019	LF	20	NS	ND (0.2)	NS	ND (0.2)	No
MW-34-100	Deep	12/10/2019	LF	750	ND (1.0)	ND (0.2)	ND (0.2)	ND (1.0)	No
MW-36-070	Middle	12/4/2019	LF	20	NS	NS	NS	ND (0.2)	No
MW-39-040	Shallow	12/5/2019	LF	20	NS	NS	NS	ND (0.2)	No
MW-42-055	Middle	12/11/2019	LF	20	NS	ND (0.2)	NS	ND (0.2)	No
MW-42-065	Middle	12/11/2019	LF	20	NS	ND (0.2)	NS	ND (0.2)	No
MW-43-075	Deep	12/12/2019	LF	20	NS	NS	NS	ND (1.0)	No
MW-43-090	Deep	12/12/2019	LF	20	NS	NS	NS	ND (1.0)	No
MW-44-070	Middle	12/11/2019	LF	20	NS	ND (0.2)	NS	ND (0.2)	No
MW-44-115	Deep	12/11/2019	LF	1,200	9.7	6.0	6.2	6.7	No
MW-44-125	Deep	12/11/2019	LF	475	NS	1.9	NS	2.6	No
MW-46-175	Deep	12/4/2019	LF	225	8.1	7.6	6.0	5.1	No
MW-46-205	Deep	12/4/2019	LF	20	NS	2.4	NS	ND (1.0)	No
MW-47-055	Shallow	12/4/2019	LF	150	NS	17	NS	21	No
MW-47-115	Deep	12/4/2019	LF	31	NS	27	NS	16	No

Notes:

1. If a field duplicate sample was collected, the maximum concentration between the primary and field duplicate sample is presented.
2. Monitoring results from Fourth Quarter 2019 are highlighted in grey.
3. None of the results from the 2019 Annual Reporting Period exceeded their respective trigger level.

µg/L = micrograms per liter.
ID = identification.
LF = Low Flow (minimal drawdown).
ND = not detected at listed reporting limit.
NS = not sampled.
Q1 = first quarter.
Q2 = second quarter.
Q3 = third quarter.
Q4 = fourth quarter.

Table 5-6

Annual Chemical Performance Monitoring Sampling Results, Fourth Quarter 2019

Fourth Quarter 2019 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 Type	Sample Method	Boron, Dissolved (mg/L)	Bromide (mg/L)	Calcium, Dissolved (mg/L)	Chloride (mg/L)	Deuterium (‰)	Magnesium, Dissolved (mg/L)	Nitrate/Nitrite as Nitrogen (mg/L)	Oxygen-18 (‰)	Potassium, Dissolved (mg/L)	Sodium, Dissolved (mg/L)	Sulfate (mg/L)	Total Alkalinity as $CaCO_3$ (mg/L)	Total Dissolved Soilds (mg/L)
MW-20-070	SA	12/13/2019		LF	--	ND (1.0)	--	400	-59.86	19	11	-8.79	5.7	--	280	98	1,300
MW-20-100	MA	12/13/2019		LF	--	0.63	--	460	-64.58	20	6.7	-9.87	6.8	--	320	130	1,300
MW-20-130	DA	12/13/2019		LF	--	ND (2.5)	--	3,500	-59.67	25 J	13	-7.87	29	3,100	990	85	7,900
MW-25	SA	12/09/2019		LF	0.37 J	ND (2.5)	120	400	-65.1	27	11	-8.65	8.2	220	210	130	1,300
MW-25	SA	12/09/2019	FD	--	0.39 J	ND (2.5)	130	390	-65.08	29	11	-8.62	8.8	240	210	120	1,200
MW-26	SA	12/12/2019		LF	1.1	ND (2.5)	160	790	-62.55	42	19	-8.51	12 J	560	470	130	2,300
MW-26	SA	12/12/2019	FD	--	1.1	ND (2.5)	150	800	-62.71	40	19	-8.57	9.3 J	440	470	130	2,300
MW-31-060	SA	12/12/2019		LF	0.51	ND (2.5)	150	880	-66.19	24	3.5	-8.66	7.2	470	220	90	1,900
MW-31-060	SA	12/12/2019	FD	--	ND (0.5)	ND (2.5)	120	870	-66.28	23	3.3	-8.65	7.0	470	220	89	1,900
MW-32-035	SA	12/09/2019		LF	1.0 J	ND (5.0)	380	2,500	-87.84	270	0.051	-11.01	16	1,400	740	740	5,700
MW-34-055	MA	12/10/2019		LF	ND (0.2)	ND (1.0)	77	84	-98.06	27	ND (0.05)	-12.28	4.9 J	92	220	160	640
MW-34-055	MA	12/10/2019	FD	--	ND (0.17)	ND (1.0)	71	83	-98.49	22	ND (0.05)	-12.26	4.7 J	90	210	150	630
MW-34-080	DA	12/10/2019		LF	1.2 J	ND (2.5)	290	2,400	-84.77	100	ND (0.05)	-11.14	17 J	1,500	610	290	5,300
MW-34-080	DA	12/10/2019	FD	--	1.2 J	ND (2.5)	290	2,300	-84.25	100	ND (0.05)	-10.75	18 J	1,600	610	290	5,300
MW-34-100	DA	12/10/2019		LF	2.3 J	ND (1.0)	180	4,000	-84	26	ND (0.05)	-11.06	31 J	3,100	1,100	150	9,200
MW-34-100	DA	12/10/2019	FD	--	2.4 J	ND (1.0)	180	4,000	-83.92	26	ND (0.05)	-10.83	30 J	2,900	1,100	160	9,100
R-28	--	11/20/2019		--	0.17 J	ND (1.0)	68	87	-95.6	24	0.28	-11.66	4.4	90	210	130	580

Notes:

1. The following analytical methods were used:
   Dissolved boron, dissolved calcium, dissolved potassium, dissolved sodium = Method SW 6010B
   Bromide, chloride, sulfate = USEPA Method 300.0
   Dissolved magnesium = Method SW 6020
   Nitrate/nitrite as nitrogen = SM 4500-NO3 F
   Total alkalinity = SM 2320B
   Total dissolved solids = SM 2540C

-- = not applicable or not reportable.
‰ = parts per thousand.
$CaCO_3$ = calcium carbonate.
DA = deep interval of Alluvial Aquifer.
FD = field duplicate.
ID = identification.
J = concentration or reporting limit (RL) estimated by laboratory or data validation.
LF = Low Flow (minimal drawdown).
MA = mid-depth interval of Alluvial Aquifer.
mg/L = milligrams per liter.
ND = not detected at listed reporting limit.
SA = shallow interval of Alluvial Aquifer.
USEPA = United States Environmental Protection Agency.

Table 5-7

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

Fourth Quarter 2019 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report

PG&E Topock Compressor Station, Needles, California

Month, Year	Davis Dam Release Projected (cfs)	Davis Dam Release Actual (cfs)	Davis Dam Release Difference (cfs)	Colorado River Elevation at I-3 Predicted (ft amsl)	Colorado River Elevation at I-3 Actual (ft amsl)	Colorado River Elevation at I-3 Difference (feet)
January 2013	8,300	8,299	1	453.20	453.28	0.04
February 2013	10,600	10,972	-372	454.30	454.63	0.40
March 2013	15,200	15,545	-345	456.00	456.29	0.30
April 2013	17,600	17,090	510	456.90	456.74	0.10
May 2013	15,800	15,592	208	456.40	456.44	0.00
June 2013	15,700	15,588	112	456.50	456.47	0.00
July 2013	14,400	13,165	1,235	456.00	455.79	0.20
August 2013	13,100	12,185	915	455.40	455.43	0.00
September 2013	11,700	11,446	254	454.80	455.02	0.20
October 2013	12,300	12,497	-197	454.90	455.09	0.20
November 2013	9,700	8,918	782	454.00	453.98	0.00
December 2013	6,400	7,636	-1,236	452.40	452.81	0.40
January 2014	8,300	8,970	-670	452.80	453.27	0.50
February 2014	11,600	11,850	-250	454.30	454.67	0.30
March 2014	16,600	17,473	-873	456.40	456.70	0.30
April 2014	18,200	17,718	482	457.10	457.08	0.00
May 2014	16,700	16,622	78	456.80	456.68	0.10
June 2014	15,900	15,917	-17	456.60	456.64	0.10
July 2014	15,100	14,640	460	456.30	456.24	0.00
August 2014	12,300	11,336	964	455.20	455.26	0.10
September 2014	13,100	12,211	889	455.30	455.30	0.00
October 2014	10,700	10,434	266	454.30	454.81	0.50
November 2014	10,700	10,575	125	454.30	454.22	0.10
December 2014	6,400	7,235	-835	452.40	452.93	0.50
January 2015	10,600	10,740	-140	454.30	454.39	0.09
February 2015	10,500	11,252	-752	454.20	454.52	0.32
March 2015	14,900	15,658	-758	455.90	456.29	0.39
April 2015	18,000	17,170	830	457.10	456.82	0.28
May 2015	16,000	13,890	2110	456.50	456.06	0.50
June 2015	14,500	13,616	884	456.10	455.94	0.16
July 2015	13,400	12,411	989	455.60	455.50	0.10
August 2015	12,100	12,627	-527	455.10	455.45	0.40
September 2015	13,300	12,734	566	455.40	INC	NA
October 2015	11,300	10,653	647	454.70	454.80	0.1
November 2015	10,000	10,066	-66	454.16	453.87	0.29
December 2015	6,200	8,556	-2,356	453.30	453.48	-0.18
January 2016	9,400	9,000	400	453.44	454.05	-0.60
February 2016	11,300	11,700	-400	454.37	454.95	-0.57
March 2016	15,800	15,000	800	455.86	456.51	-0.65
April 2016	15,400	16,400	-1,000	456.77	457.17	-0.40
May 2016	15,800	14,700	1,100	455.98	456.76	-0.78
June 2016	14,400	14,100	300	456.01	456.64	-0.62
July 2016	13,300	13,100	200	455.73	456.38	-0.65
August 2016	11,500	11,600	-100	455.02	455.70	-0.69
September 2016	12,200	11,900	300	455.19	455.83	-0.63
October 2016	10,400	10,400	0	454.25	455.23	-0.98
November 2016	9,900	9,600	300	453.70	454.40	-0.70
December 2016	8,300	7,800	500	453.37	453.55	-0.18
January 2017	8,000	6,600	1,400	453.22	453.36	-0.14
February 2017	9,500	8,700	800	453.91	454.15	-0.24
March 2017	13,900	13,700	200	455.53	456.10	-0.57
April 2017	15,900	16,100	-200	456.40	456.97	-0.57
May 2017	14,000	13,800	200	455.74	456.39	-0.66
June 2017	13,600	14,300	-700	455.95	456.46	-0.51
July 2017	13,300	13,300	0	455.62	456.22	-0.59

Table 5-7

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

Fourth Quarter 2019 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report

PG&E Topock Compressor Station, Needles, California

Month, Year	Davis Dam Release Projected (cfs)	Davis Dam Release Actual (cfs)	Davis Dam Release Difference (cfs)	Colorado River Elevation at I-3 Predicted (ft amsl)	Colorado River Elevation at I-3 Actual (ft amsl)	Colorado River Elevation at I-3 Difference (feet)
August 2017	11,500	11,500	0	454.91	455.59	-0.68
September 2017	12,700	11,100	1,600	454.39	455.32	-0.93
October 2017	12,000	10,900	1,100	454.01	455.15	-1.14
November 2017	10,400	10,000	400	454.25	454.70	-0.45
December 2017	8,800	9,000	-200	453.51	454.09	-0.58
January 2018	8,100	7,100	1,000	452.50	453.05	-0.55
February 2018	11,100	11,000	100	454.40	454.82	-0.42
March 2018	14,400	13,600	800	455.38	455.94	-0.56
April 2018	16,000	16,800	-800	456.25	457.09	-0.84
May 2018	15,900	16,300	-400	456.80	457.06	-0.26
June 2018	15,600	15,300	300	456.40	456.88	-0.48
July 2018	13,700	13,400	300	455.60	456.33	-0.73
August 2018	12,000	11,900	100	454.91	455.58	-0.67
September 2018	13,400	13,700	-300	464.03	456.29	7.74
October 2018	11,200	10,300	900	454.54	455.16	-0.62
November 2018	10,500	10,300	200	454.40	455.02	-0.62
December 2018	7,300	6,300	1000	452.94	453.33	-0.39
January 2019	7,300	6,800	500	452.96	453.32	-0.36
February 2019	11,800	10,200	1600	454.71	454.85	-0.14
March 2019	12,400	12,200	200	455.09	455.47	-0.38
April 2019	15,100	14,900	200	456.20	456.55	-0.35
May 2019	15,200	15,200	0	456.40	456.87	-0.47
June 2019	15,100	14,900	200	456.38	456.80	-0.42
July 2019	14,200	14,500	-300	455.90	456.53	-0.63
August 2019	12,700	13,000	-300	455.31	455.84	-0.53
September 2019	13,600	12,900	700	455.52	456.06	-0.54
October 2019	9,800	9,600	200	454.19	454.88	-0.69
November 2019	8,400	7,700	700	453.71	453.89	-0.18
December 2019	4,300	4,000	300	451.93	452.61	-0.68
January 2020	5,600	--	--	452.39	--	--

Notes:

1. Projected river level for each month is calculated based on the preceding month's U.S. Bureau of Reclamation (USBR) projections of Davis Dam release and stage in Lake Havasu.

2. Projected and actual Davis Dam releases are reported monthly by the USBR, available online at https://www.usbr.gov/uc/water/crsp/studies/24Month_01.pdf.

-- = not applicable.
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 dataset.

Table 6-1

Summary of Pumping Rates and Extracted Volumes for IM-3 System, 2019 Annual Reporting Period

Fourth Quarter 2019 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report

PG&E Topock Compressor Station, Needles, California

Month	Average Monthly Pump Rate (gpm)	TW-02S Groundwater Volume Pumped (gallons)	TW-02D Groundwater Volume Pumped (gallons)	TW-03D Groundwater Volume Pumped (gallons)	PE-01 Groundwater Volume Pumped (gallons)	Total Groundwater Volume Pumped (gallons)
January 2019	134.2	--	--	5,989,074	189	5,989,263
February 2019	131.4	--	--	5,298,902	280	5,299,182
March 2019	134.1	--	--	5,985,134	137	5,985,271
April 2019	110.5	--	--	4,773,889	209	4,774,098
May 2019	130.0	--	--	5,801,252	370	5,801,622
June 2019	131.1	--	--	5,662,382	133	5,662,515
July 2019	123.4	--	--	5,506,500	261	5,506,761
August 2019	110.7	--	--	4,940,207	357	4,940,564
September 2019	127.9	--	--	5,525,561	206	5,525,767
October 2019	131.9	--	56	5,885,424	497	5,885,977
November 2019	129.8	--	--	5,604,878	712	5,605,590
December 2019	126.9	--	--	5,665,901	262	5,666,162
TOTAL	**126.8**	**--**	**56**	**66,639,103**	**3,613**	**66,642,772**

Notes:

1. The target pump rate was 135 gpm.
2. Extraction wells PE-01 and TW-02D were only pumped to collect samples. TW-02S was not pumped during 2019.

-- = not applicable.
gpm = gallons per minute.
IM = Interim Measure.

Table 6-2

Hydraulic Gradients Measured at Well Pairs, 2019 Annual Reporting Period

Fourth Quarter 2019 and Annual Interim Measures Performance Monitoring and Site-wide Groundwater and Surface Water Monitoring Report

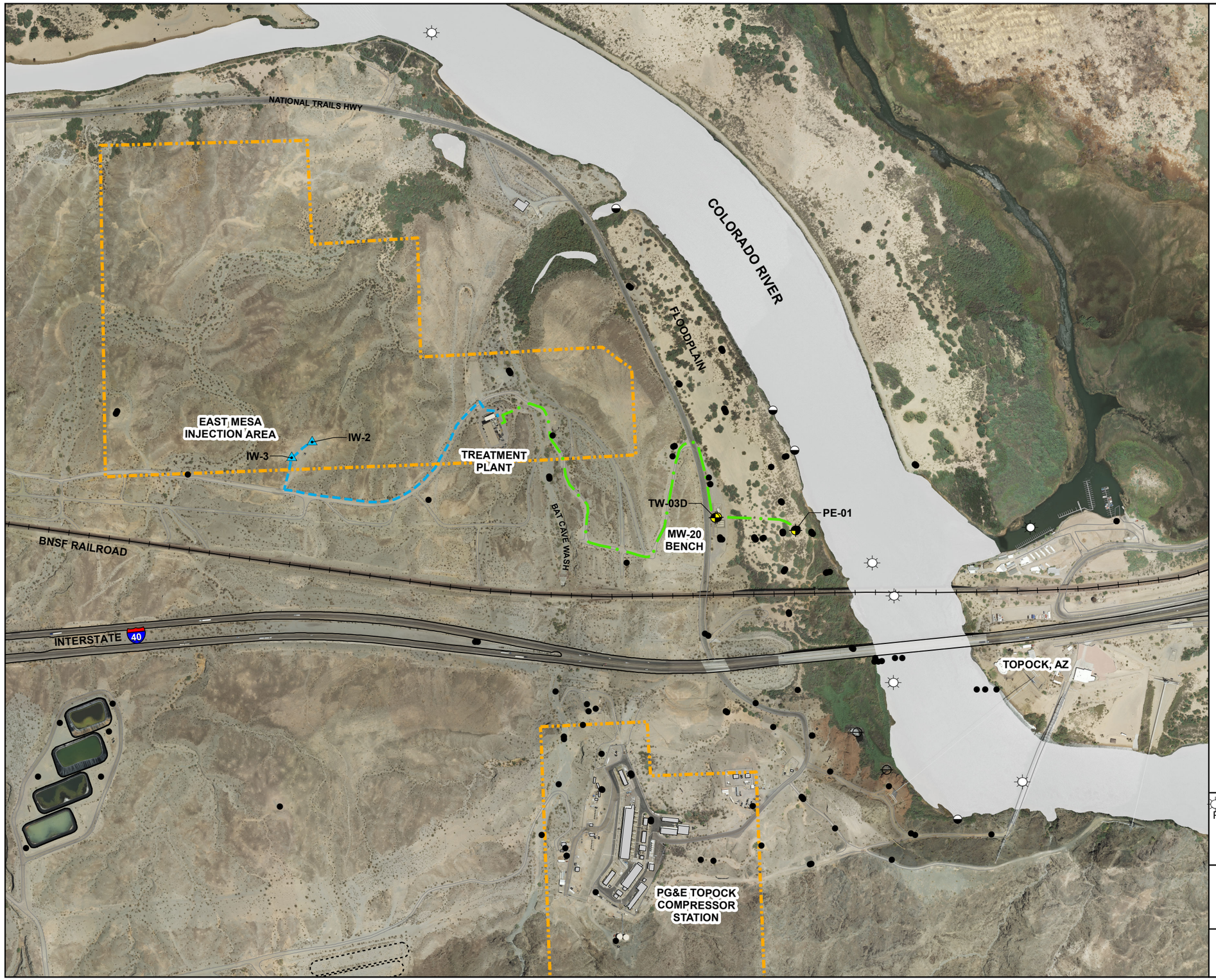
PG&E Topock Compressor Station, Needles, California

Month	Mean Landward Hydraulic Gradient (feet/foot) Overall Average	Mean Landward Hydraulic Gradient (feet/foot) Northern Gradient Pair MW-31-135 / MW-33-150	Mean Landward Hydraulic Gradient (feet/foot) Central Gradient Pair MW-20-130 / MW-34-100	Mean Landward Hydraulic Gradient (feet/foot) Southern Gradient Pair MW-20-130 / MW-27-085
January 2019	0.0036	0.0028	0.0044	0.0035
February 2019	0.0042	0.0029	0.0054	0.0043
March 2019	0.0043	0.0031	0.0054	0.0045
April 2019	0.0039	0.0026	0.0050	0.0040
May 2019	0.0042	0.0029	0.0053	0.0044
June 2019	0.0042	0.0030	0.0054	0.0043
July 2019	0.0033	0.0026	0.0040	0.0032
August 2019	0.0031	0.0026	0.0038	0.0030
September 2019	0.0032	0.0027	0.0036	0.0033
October 2019	0.0037	0.0037	0.0040	0.0033
November 2019	0.0046	0.0038	0.0057	0.0044
December 2019	0.0034	0.0024	0.0044	0.0034

Notes:

1. The target mean landward hydraulic gradient for the selected well pairs is 0.001 feet/foot.
2. Beginning in August 2017, MW-20-130 was approved for gradient compliance (instead of MW-45-95) at the central and southern well pairs during months when PE-01 is not run for gradient control. PE-01 was not run for gradient control during the 2019 Annual Reporting Period.
3. The target mean landward hydraulic gradient was met throughout the 2019 Annual Reporting Period.

FIGURES



LEGEND

- IM-3 Extraction Well (Active)
- IM-3 Injection Well
- Monitoring Well in Site-Wide Groundwater Monitoring Program (GMP)
- 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.

0 500 1,000
Feet

FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT

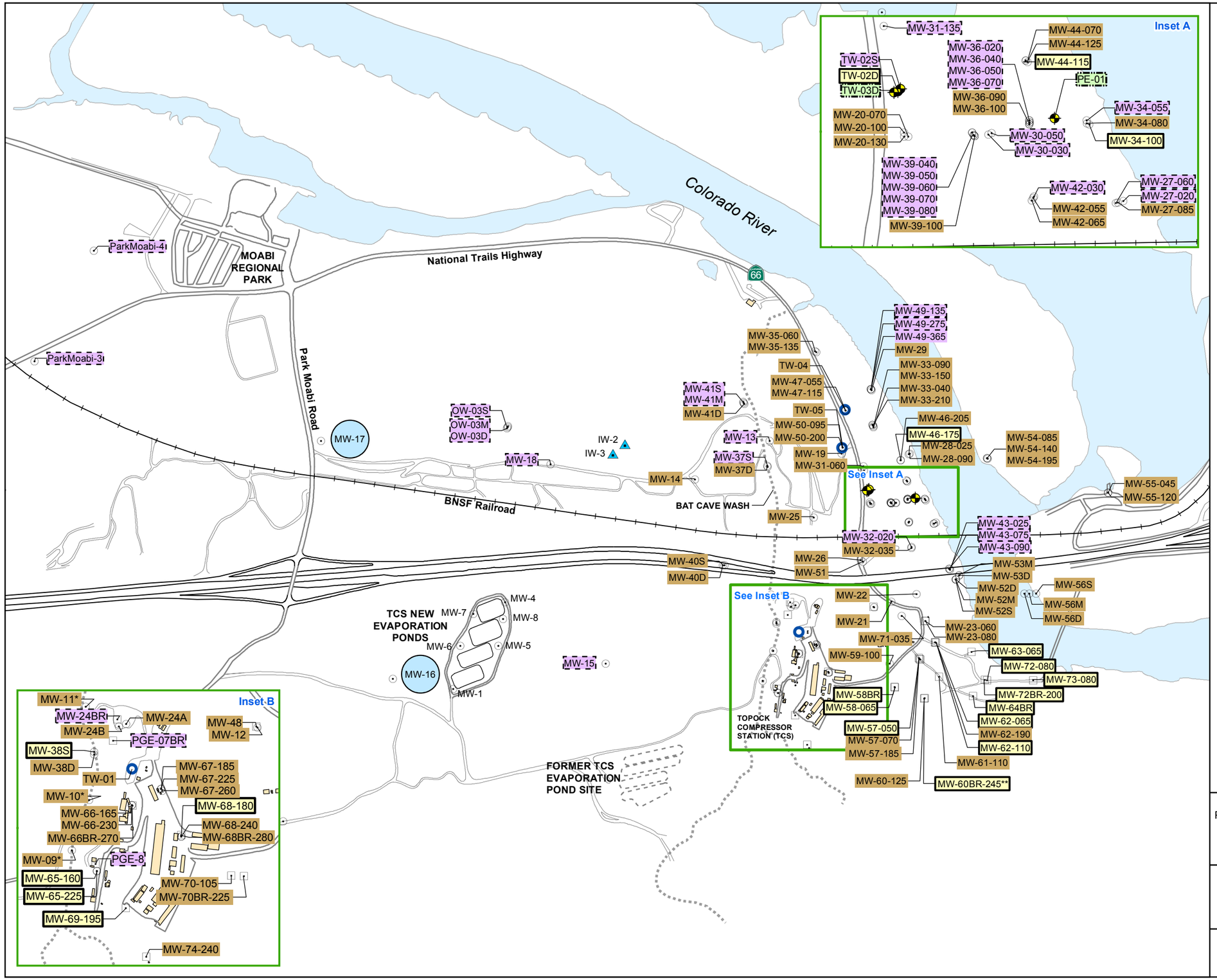
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

LOCATIONS OF IM-3 FACILITIES AND MONITORING LOCATIONS

ARCADIS Design & Consultancy for natural and built assets

FIGURE
1-1

Z:\GISPROJECTS_ENV\PGE_TOPOCK\GEC\MXD\GMP\4Q19\FINAL\FIGURE1-1_IM3_GMP_LOCS_2019Q4.MXD 1/14/2020 3:17:38 AM



LEGEND

- Groundwater Monitoring Well Completed in Bedrock
- Injection Well
- Groundwater Monitoring Well Completed in Alluvial Aquifer
- 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-60BR-245**	Monitoring well currently being evaluated in Sampling Method Trail.
MW-21	Semiannual sampling
MW-38S	Quarterly sampling
TW-3D	Monthly sampling

Notes:
1. GMP = Groundwater Monitoring Program
2. TCS = Topock Compressor Station

0 500 1,000
Feet

FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT

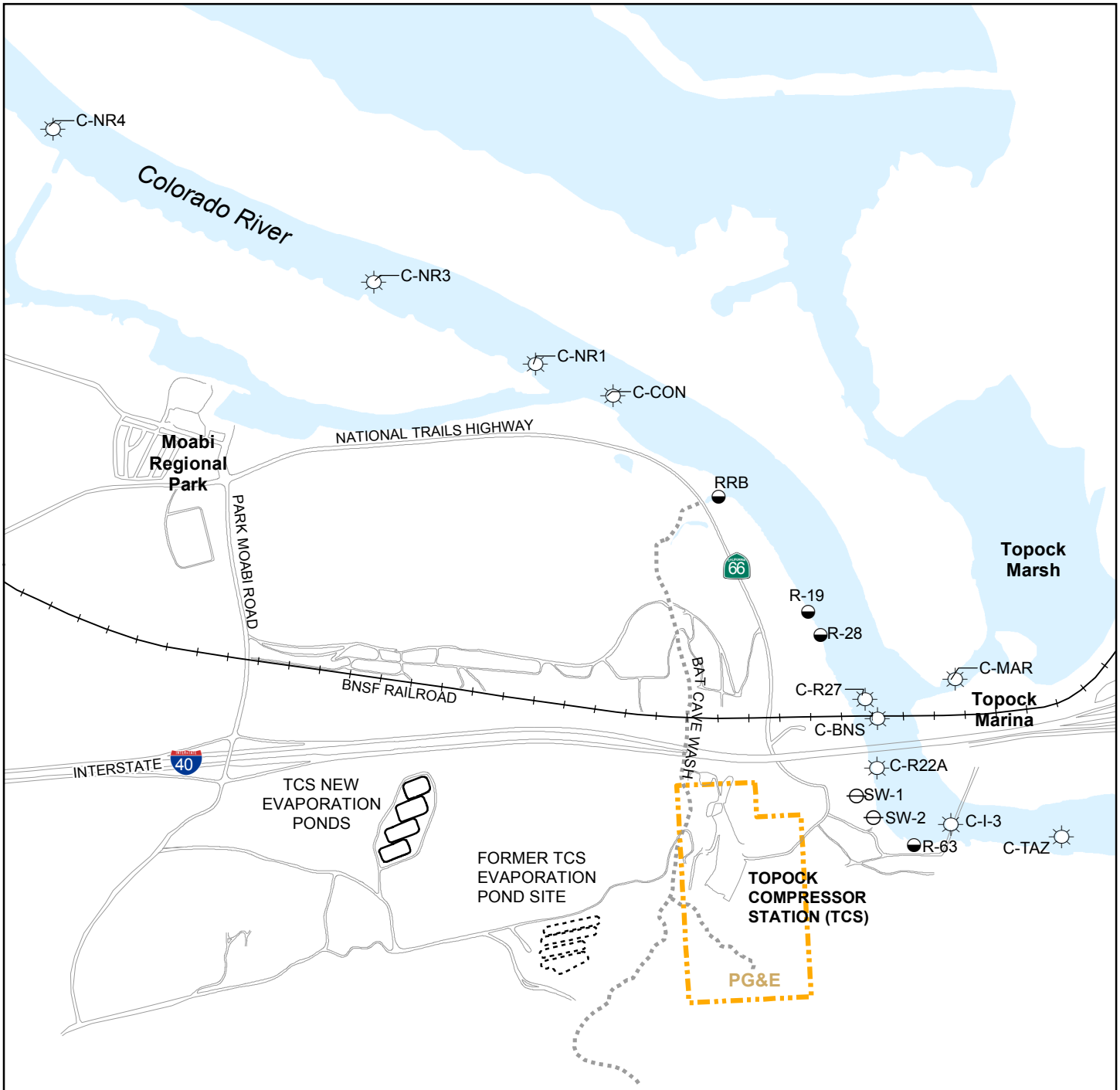
PG&E TOPOCK COMPRESSOR STATION NEEDLES, CALIFORNIA

MONITORING LOCATIONS AND SAMPLING FREQUENCY FOR GMP

ARCADIS Design & Consultancy for natural and built assets

FIGURE 1-2

Z:\GISPROJECTS_ENV\PGE_TOPOCK\GEC\MXD\GMP\4Q19\FINAL\FIGURE1-2_GMP_SAMPLING_FREQUENCY_2019Q4.MXD 1/14/2020 5:31:51 AM



LEGEND

- Shoreline Surface Water Monitoring Location
- River Channel Surface Water Monitoring Location
- Other Surface Water Monitoring Location
- PG&E Property Line

0 600 1,200
Feet

Notes:

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

FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT

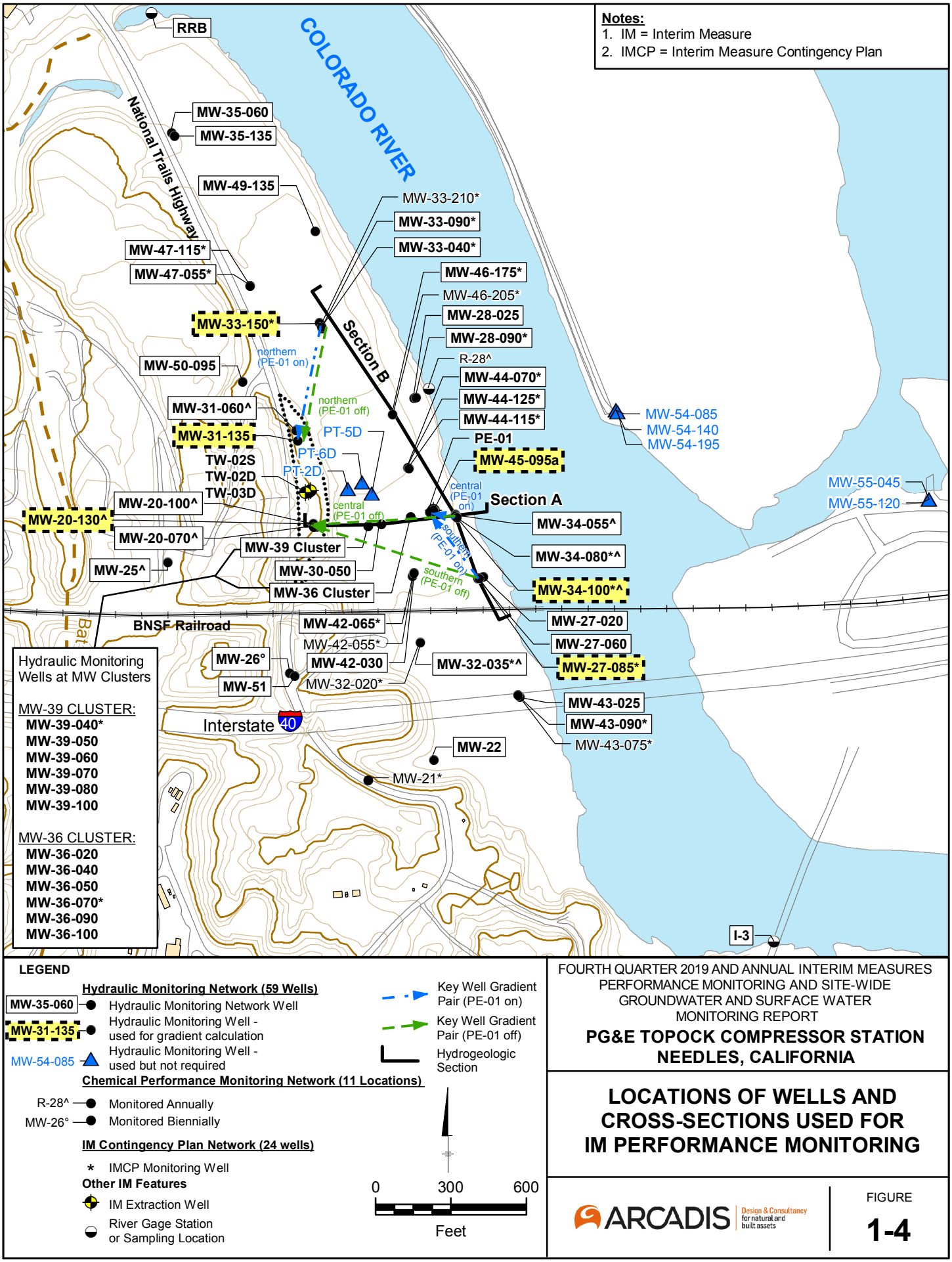
PG&E TOPOCK COMPRESSOR STATION NEEDLES, CALIFORNIA

MONITORING LOCATIONS AND SAMPLING FREQUENCY FOR RMP

ARCADIS Design & Consultancy for natural and built assets

FIGURE **1-3**

Z:\GISPROJECTS_ENV\PGE_TOPOCK\GEC\MXD\GMP\4Q19\FINAL\FIGURE1-3_GMP_RIVER_SWLOCS_2019Q4.MXD 2/26/2020 3:25:47 AM



FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT

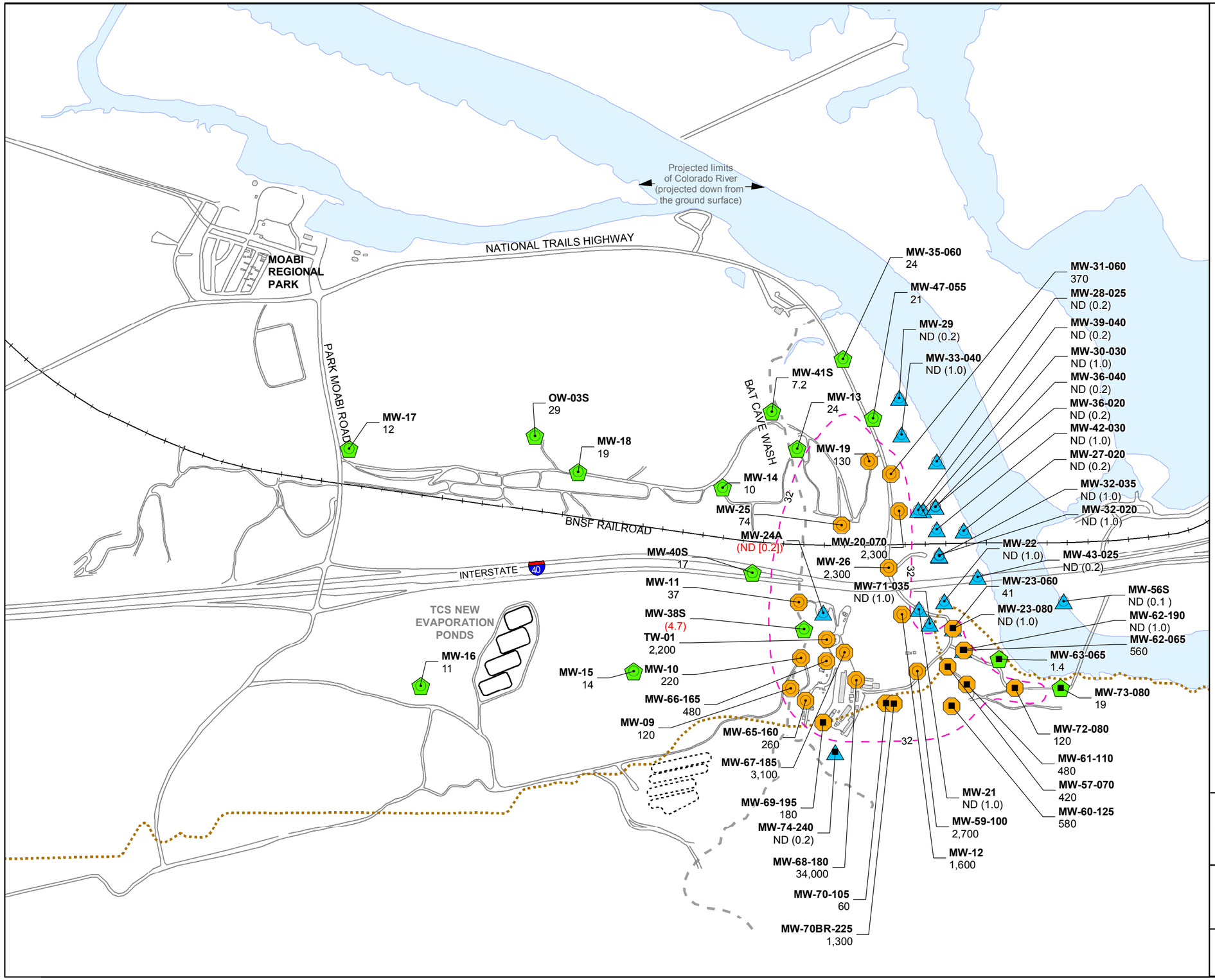
PG&E TOPOCK COMPRESSOR STATION NEEDLES, CALIFORNIA

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

ARCADIS Design & Consultancy for natural and built assets

FIGURE **1-4**

Z:\GISPROJECTS_ENV\PGE_TOPOCK\GEC\MXD\GMP\4Q19\FINAL\FIGURE1-4_IMP_XSECTION_2019Q4.MXD 1/14/2020 5:19:21 AM



LEGEND

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

Cr(VI) Concentrations

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

MW-35-060 — Sampling Location
24 — Groundwater Cr(VI) Concentration (µg/L)
(4.7) — Groundwater Cr(VI) Concentration (ug/L) not used for contouring

Notes:
1. µg/L = micrograms per liter
2. Cr(VI) = Hexavalent Chromium
3. TCS = Topock Compressor Station
4. ≥ = greater than or equal to
5. 32 µg/L is used as the background Cr(VI) concentration in groundwater for remedial activities.
6. Results plotted are maximum concentration from primary and duplicate samples.
7. The 32 µg/L boundary for Cr(VI) is estimated based on available groundwater analytical results from Fourth Quarter 2018 and the current quarter.
8. Long-screened wells and wells screened across more than one depth interval are generally not posted on this map.

0 500 1,000
Feet

FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT

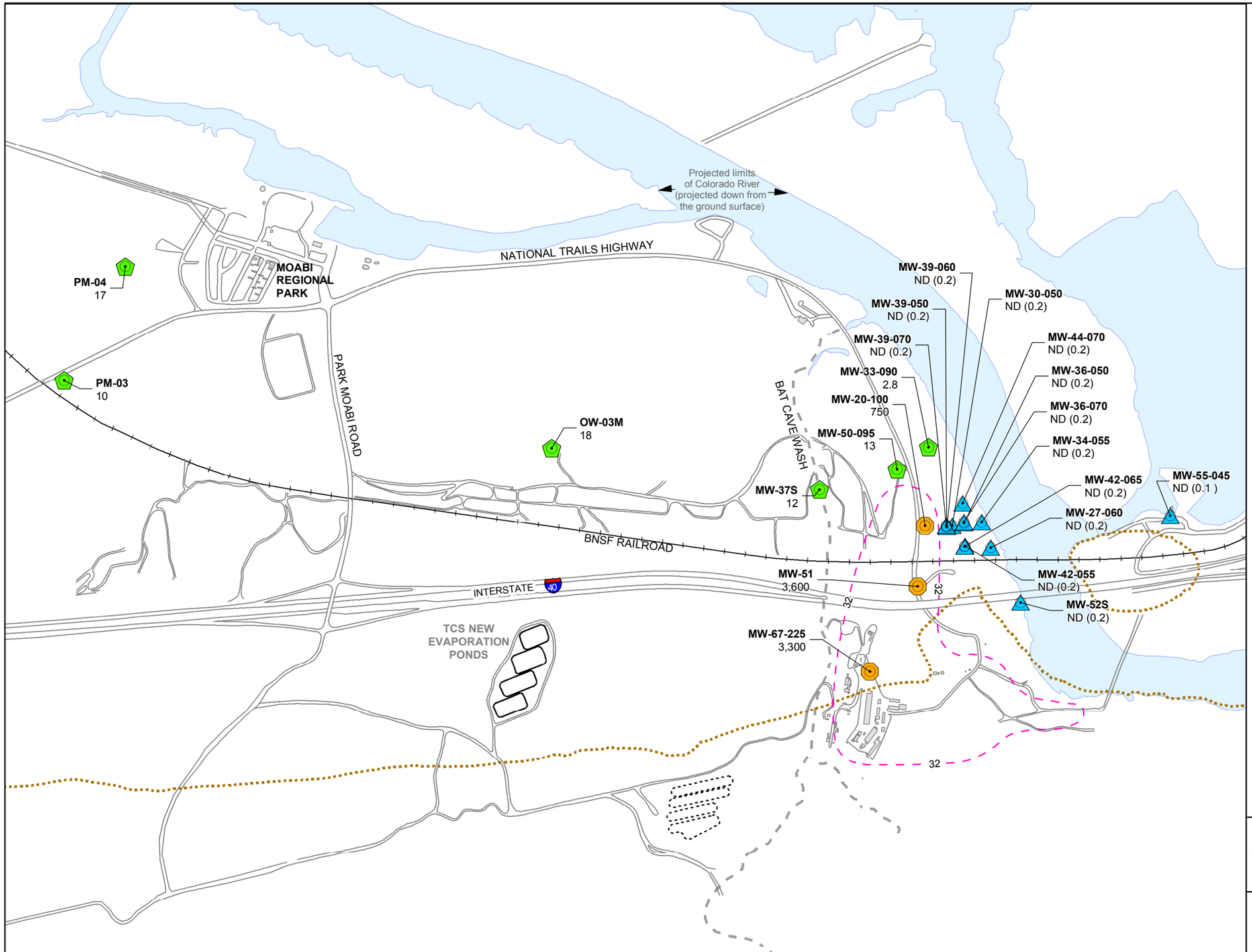
PG&E TOPOCK COMPRESSOR STATION NEEDLES, CALIFORNIA

Cr(VI) SAMPLING RESULTS, SHALLOW WELLS IN ALLUVIAL AQUIFER AND BEDROCK, FOURTH QUARTER 2019

ARCADIS Design & Consultancy for natural and built assets

FIGURE 3-1a

Z:\GISPROJECTS_ENV\PGE_TOPOCK\GEC\MXD\GMP\4Q19\FINAL\FIGURE3-1A_CRVI_SHALLOW_2019Q4.MXD SHARMAYH4948 2/27/2020 11:04:15 PM



LEGEND

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

Cr(VI) Concentrations

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

MW-33-090 — Sampling Location
2.7 — Groundwater Cr(VI) Concentration (µg/L)
(4.8) — Groundwater Cr(VI) Concentration (ug/L) not used for contouring

Notes:
1. ND = Cr(VI) not detected at analytical reporting limit.
2. µg/L = micrograms per liter
3. Cr(VI) = Hexavalent Chromium
4. TCS = Topock Compressor Station
5. ≥ = greater than or equal to
6. 32 µg/L is used as the background Cr(VI) concentration in groundwater for remedial activities.
7. Results plotted are maximum concentration from primary and duplicate samples.
8. The 32 µg/L boundary for Cr(VI) is estimated based on available groundwater analytical results from Fourth Quarter 2018 and the current quarter.
9. Long-screened wells and wells screened across more than one depth interval are generally not posted on this map.

0 500 1,000
Feet

FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT

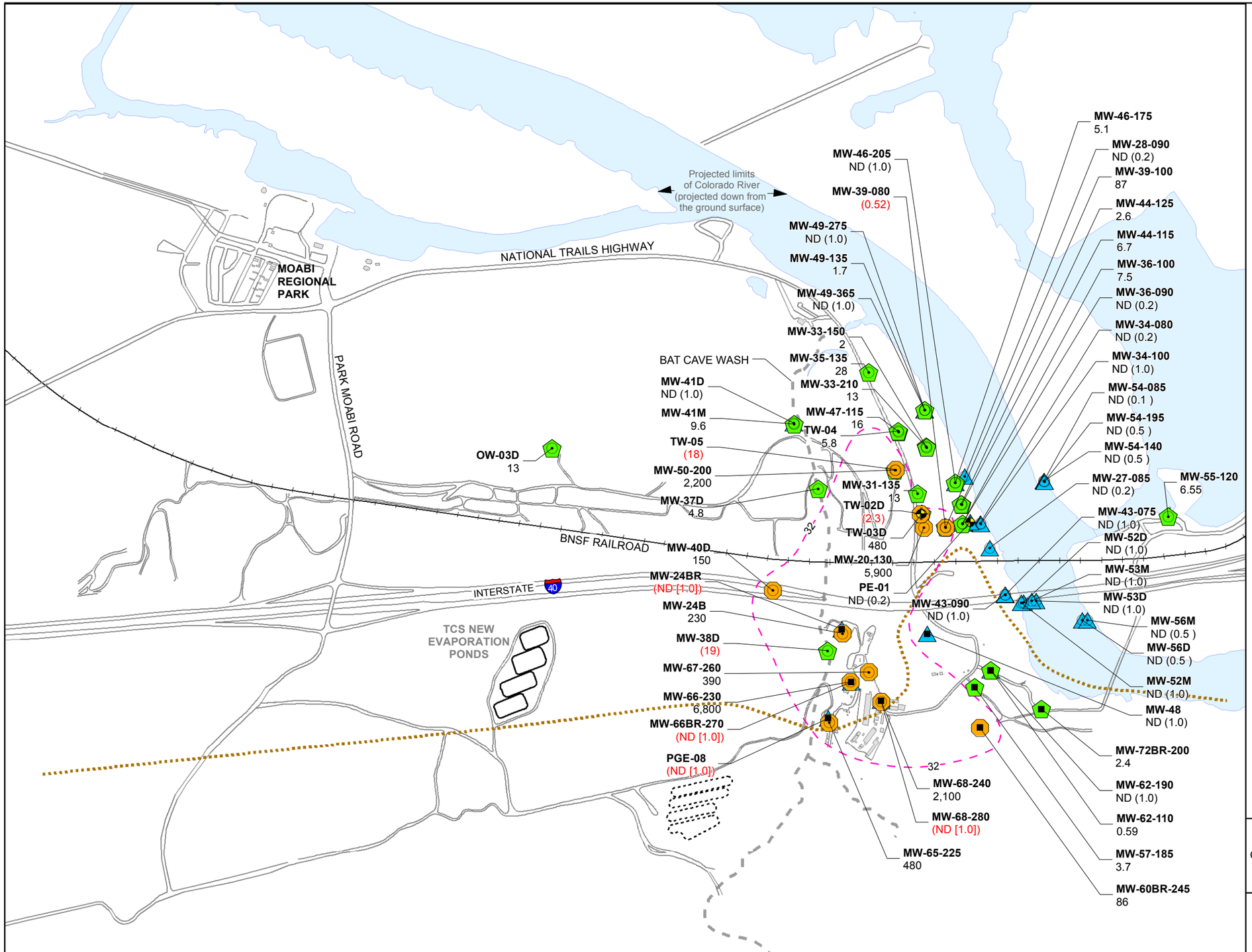
PG&E TOPOCK COMPRESSOR STATION NEEDLES, CALIFORNIA

Cr(VI) SAMPLING RESULTS, MID-DEPTH WELLS IN ALLUVIAL AQUIFER AND BEDROCK, FOURTH QUARTER 2019

ARCADIS Design & Consultancy for natural and built assets

FIGURE 3-1b

Z:\GISPROJECTS_ENV\PGE_TOPOCK\GEC\MXD\GMP\4Q19\FINAL\FIGURE3-1B_CRVI_DEEP_2019Q4.MXD SHARMAYH4948 2/27/2020 11:41:31 PM



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 analytical reporting limit
- Concentration between reporting limit and 32 µg/L
- Concentration ≥ 32 µg/L
- Approximate boundary of "deep" wells with Cr(VI) concentrations ≥ 32 µg/L
- Approximate bedrock contact at 395 feet above mean sea level.

MW-39-100 — Sampling Location
87 — Groundwater Cr(VI) Concentration (µg/L)
(19) — Groundwater Cr(VI) Concentration (ug/L) not used for contouring

Notes:
1. ND = Cr(VI) not detected at analytical reporting limit.
2. µg/L = micrograms per liter
3. Cr(VI) = Hexavalent Chromium
4. TCS = Topock Compressor Station
5. ≥ = greater than or equal to
6. 32 µg/L is used as the background Cr(VI) concentration in groundwater for remedial activities.
7. Results plotted are maximum concentration from primary and duplicate samples.
8. The 32 µg/L boundary for Cr(VI) is estimated based on available groundwater analytical results from Fourth Quarter 2018 and the current quarter.
9. Long-screened wells and wells screened across more than one depth interval are generally not posted on this map.

0 500 1,000
Feet

FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT

PG&E TOPOCK COMPRESSOR STATION NEEDLES, CALIFORNIA

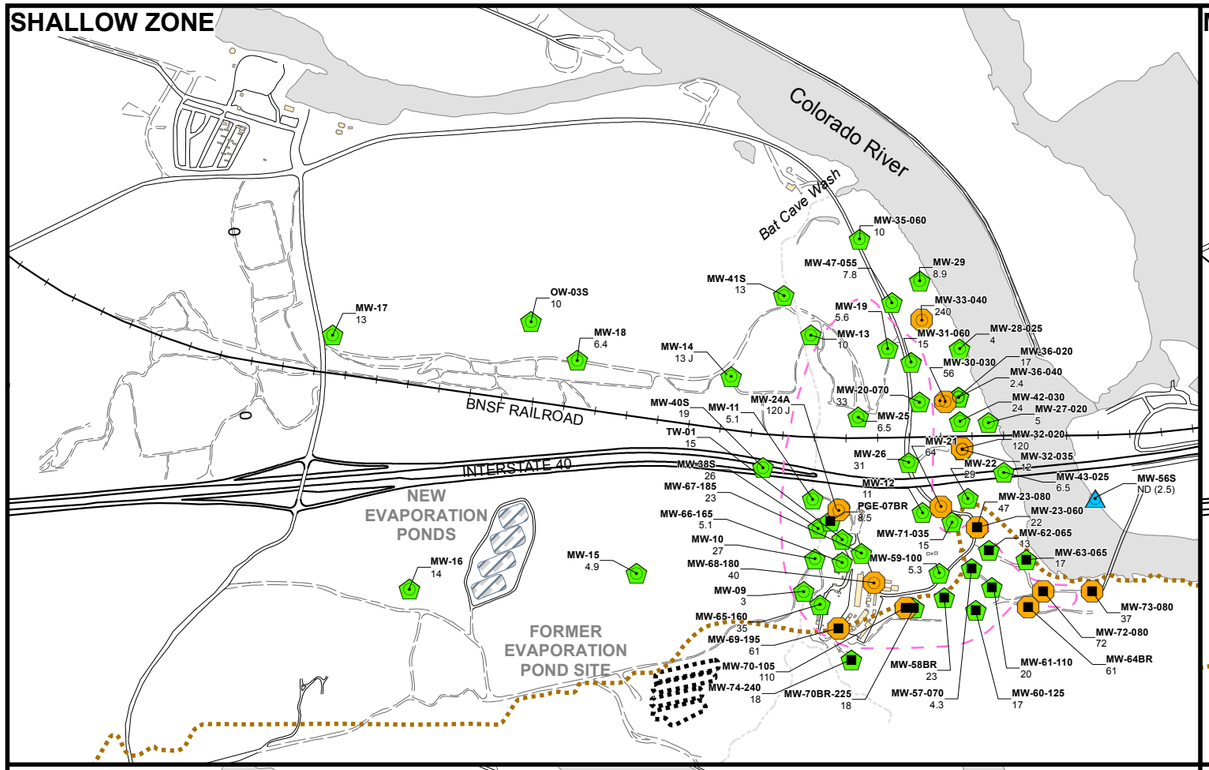
Cr(VI) SAMPLING RESULTS, DEEP WELLS IN ALLUVIAL AQUIFER AND BEDROCK, FOURTH QUARTER 2019

ARCADIS Design & Consultancy for natural and built assets

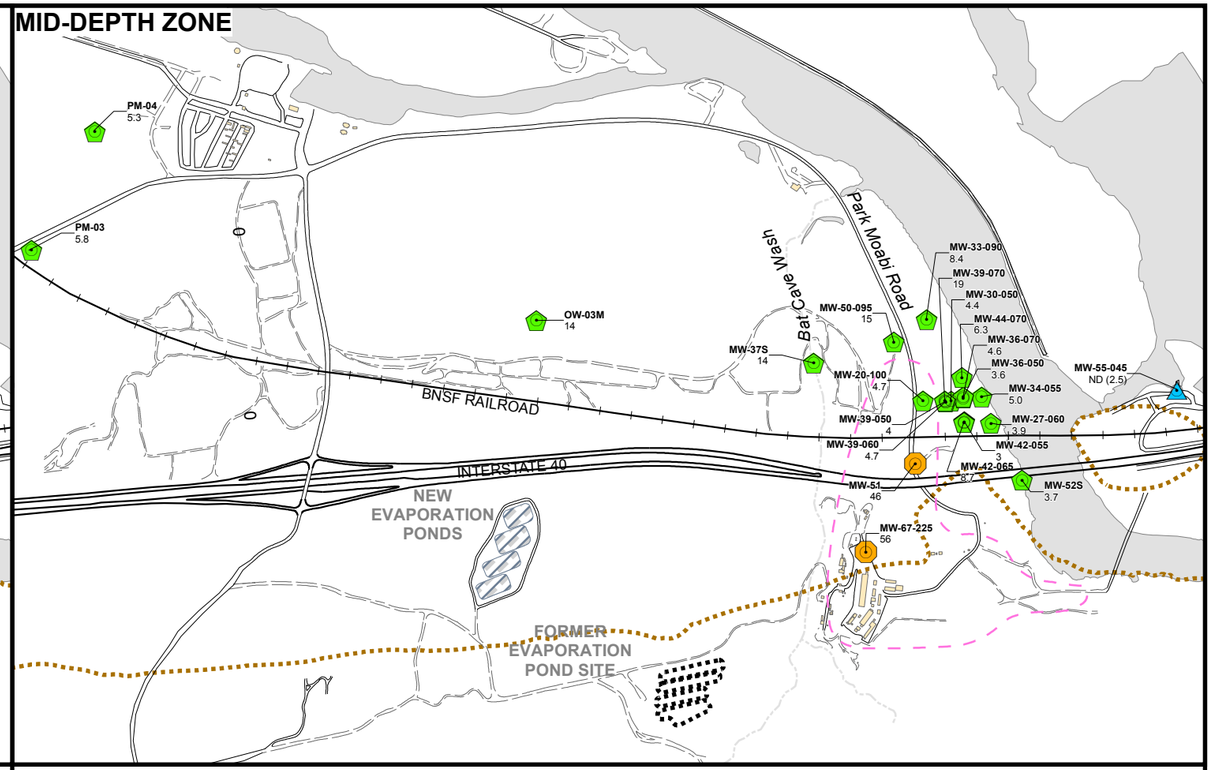
FIGURE 3-1c

Z:\GISPROJECTS_ENV\PGE_TOPOCK\GEC\MXD\GMP\4Q19\FINAL\FIGURE3-1C_CRVI_DEEP_2019Q4.MXD LDRUM 3/12/2020 8:38:15 AM

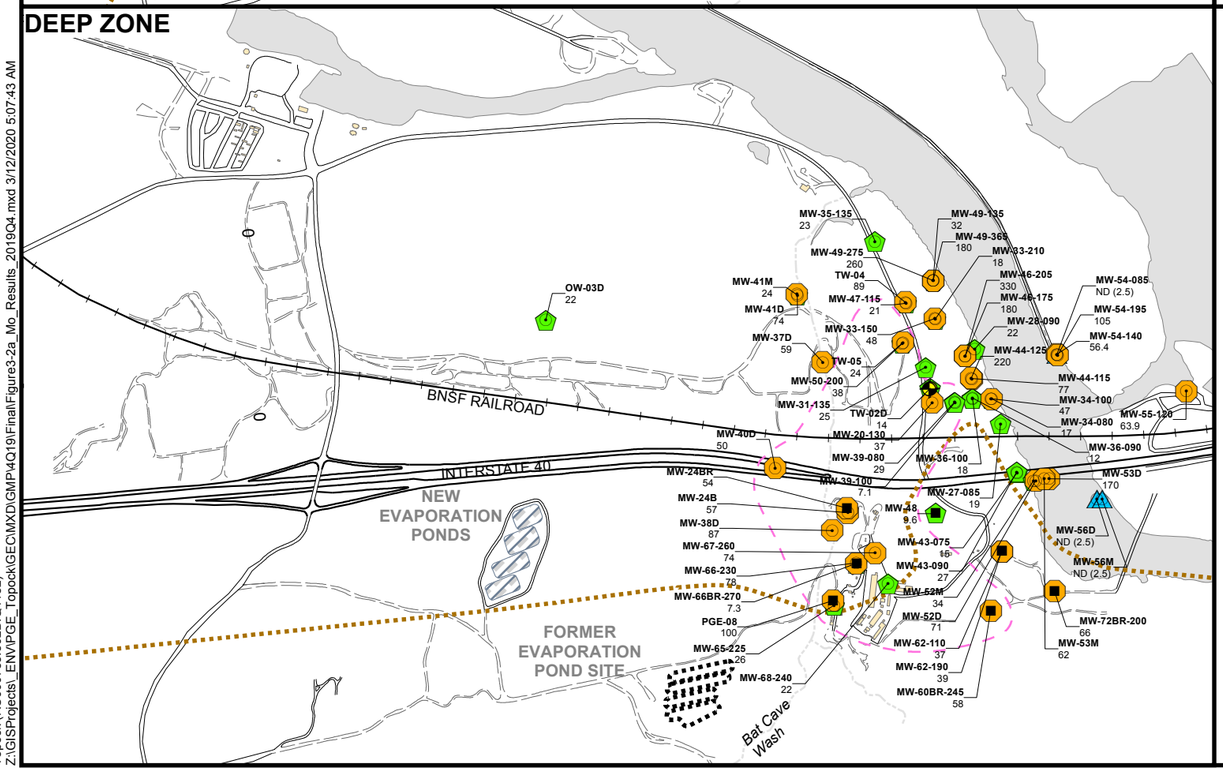
SHALLOW ZONE



MID-DEPTH ZONE



DEEP ZONE



LEGEND

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

Dissolved Molybdenum Concentrations

- Not detected at analytical reporting limit
- Concentration between reporting limit and 36.3 µg/L
- Concentration ≥ 36.3 µg/L
- Approximate boundary of hexavalent chromium concentrations ≥ 32 µg/L
- Approximate bedrock contact (per depth interval)

MW-66-165 ——— Sampling Location
5.1 ——— Groundwater Dissolved Molybdenum Concentration (µg/L)

0 1,000 2,000 Feet
GRAPHIC SCALE

N

Notes:

1. ND = Not detected at listed reporting limit
2. µg/L = micrograms per liter
3. ≥ = Greater than or equal to
4. J = The analyte was positively identified: the associated numerical value is the approximate concentration of the analyte in the sample.
5. USEPA = United States Environmental Protection Agency
6. Results plotted are maximum concentration from primary and duplicate samples.
7. Dissolved molybdenum background study upper tolerance limit (UTL) = 36.3 µg/L. The background study UTL was developed for alluvial wells only.
8. There is no USEPA or California maximum contaminant level for molybdenum.
9. Long-screened wells and wells screened across more than one depth interval are generally not posted on this map.

FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

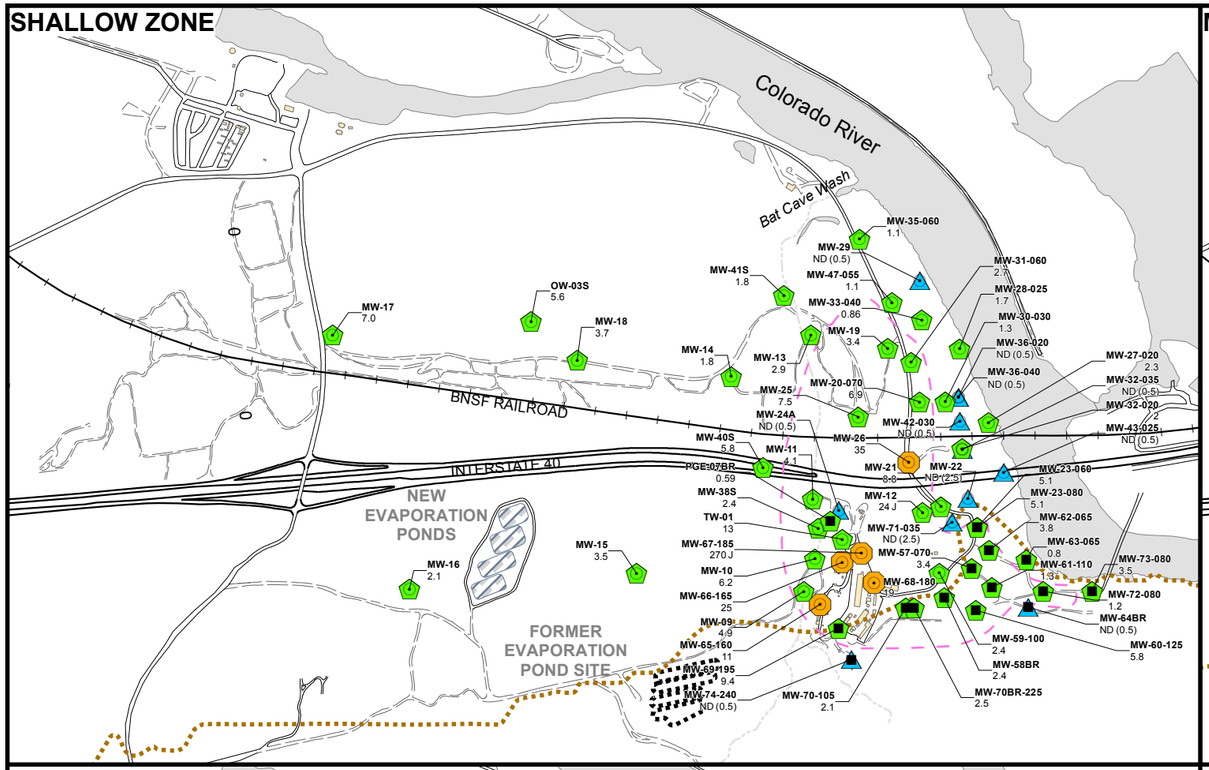
DISSOLVED MOLYBDENUM SAMPLING RESULTS, FOURTH QUARTER 2019

ARCADIS Design & Consultancy for natural and built assets

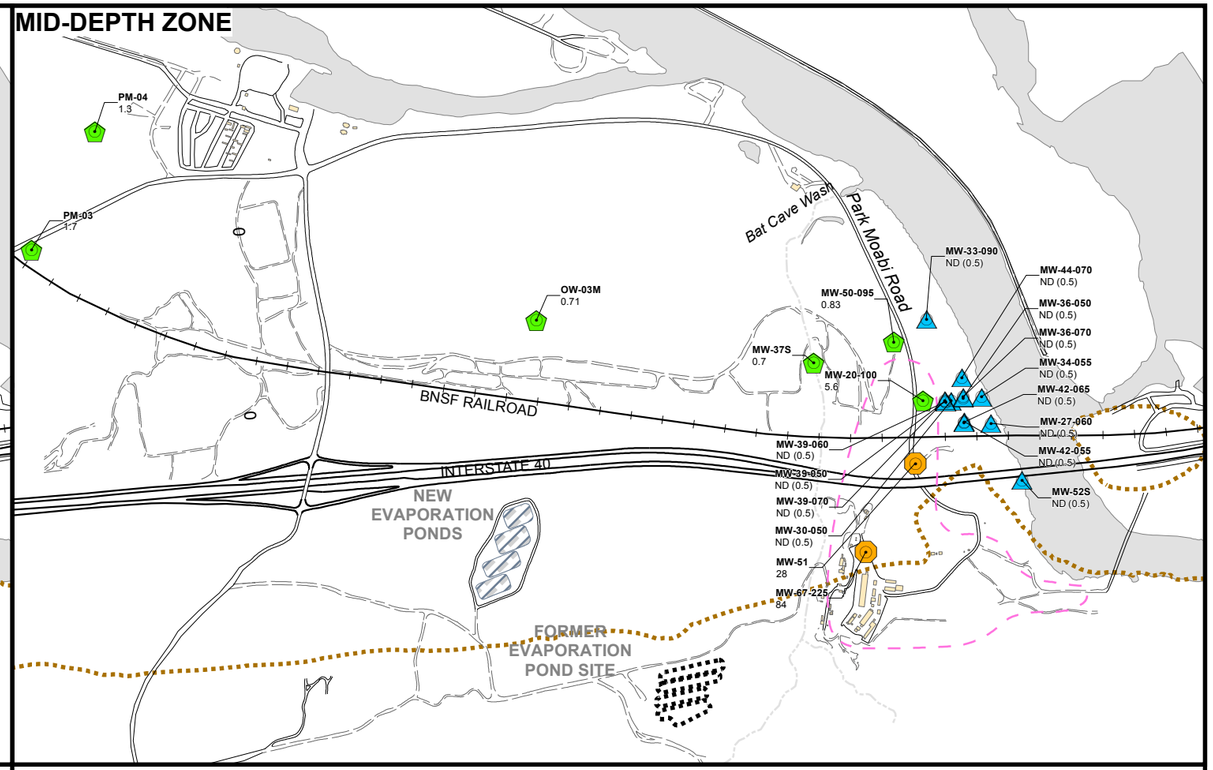
FIGURE **3-2a**

City: Citrix Div/Group: IM Created By: K. SINSABAUGH Last Saved By: Idrum
Topock (RC000753.8020.04182)
Z:\GISProjects_ENV\PGE_Topock\GEC\MXD\GMP\4Q19\FinalFigure3-2a_Mo_Results_2019Q4.mxd 3/12/2020 5:07:43 AM

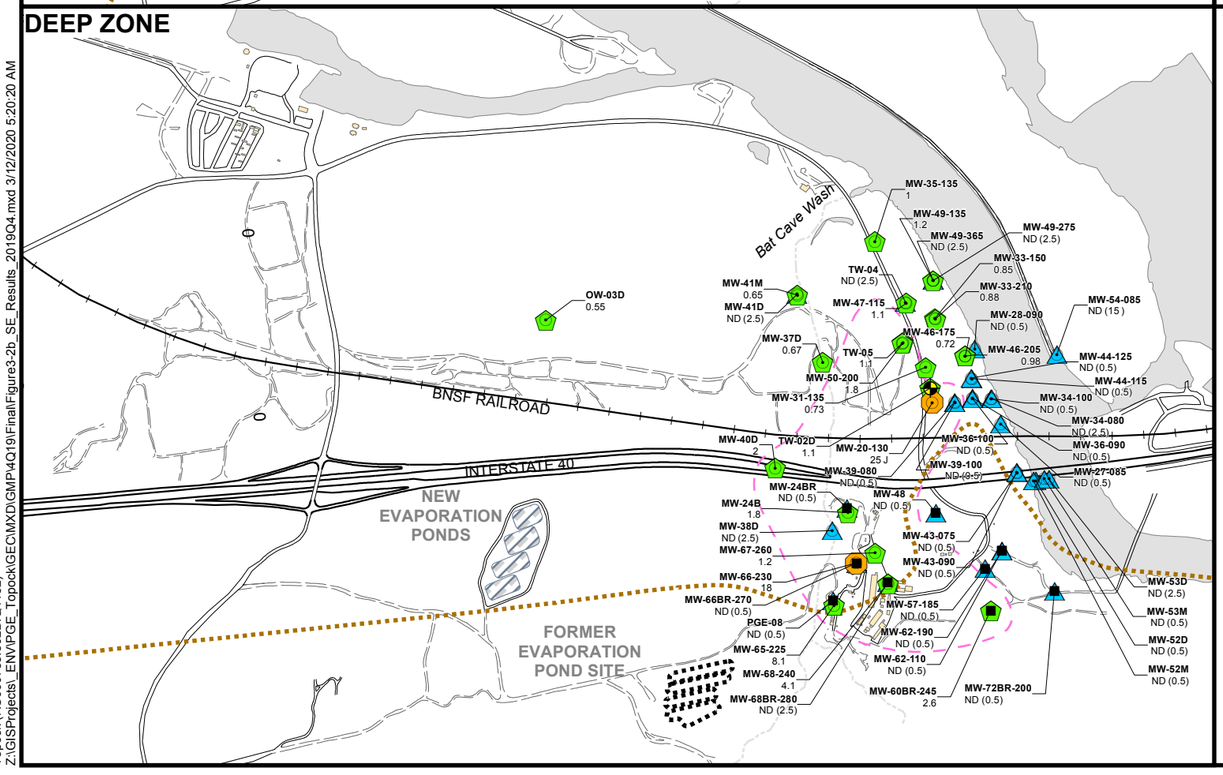
SHALLOW ZONE



MID-DEPTH ZONE



DEEP ZONE



LEGEND

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

Dissolved Selenium Concentrations

- Not detected at analytical reporting limit
- Concentration between reporting limit and 10.3 µg/L
- Concentration ≥ 10.3 µg/L
- Approximate boundary of hexavalent chromium concentrations ≥ 32 µg/L
- Approximate bedrock contact (per depth interval)

MW-66-165 ——— Sampling Location
25 ——— Groundwater Dissolved Selenium Concentration (µg/L)

0 1,000 2,000 Feet
GRAPHIC SCALE

N

Notes:

1. ND = Not detected at listed reporting limit
2. µg/L = micrograms per liter
3. ≥ = Greater than or equal to
4. J = The analyte was positively identified: the associated numerical value is the approximate concentration of the analyte in the sample.
5. USEPA = United States Environmental Protection Agency
6. Results plotted are maximum concentration from primary and duplicate samples.
7. Dissolved selenium background study upper tolerance limit (UTL) = 10.3 µg/L. The background study UTL was developed for alluvial wells only.
8. USEPA and California maximum contaminant level (MCL) = 50 ug/L. Comparison to the MCL is not shown on the figure.
9. Long-screened wells and wells screened across more than one depth interval are generally not posted on this map.

FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

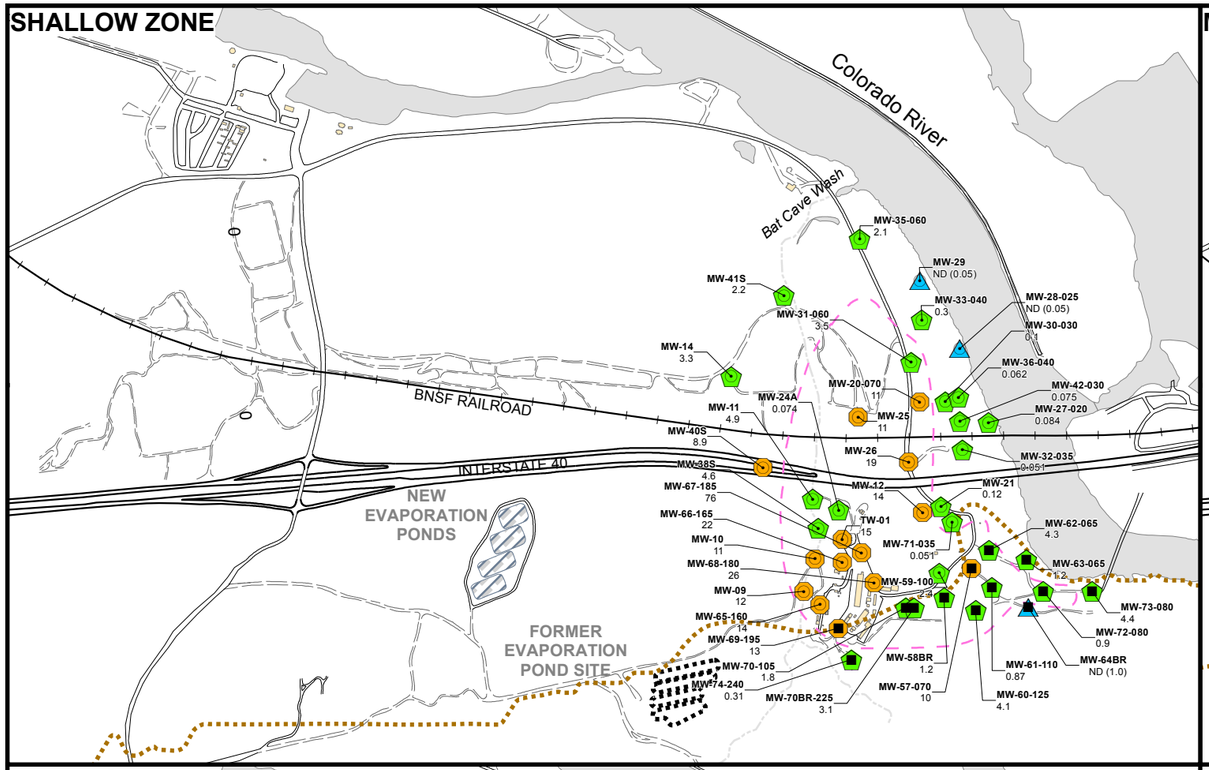
DISSOLVED SELENIUM SAMPLING RESULTS, FOURTH QUARTER 2019

ARCADIS Design & Consultancy for natural and built assets

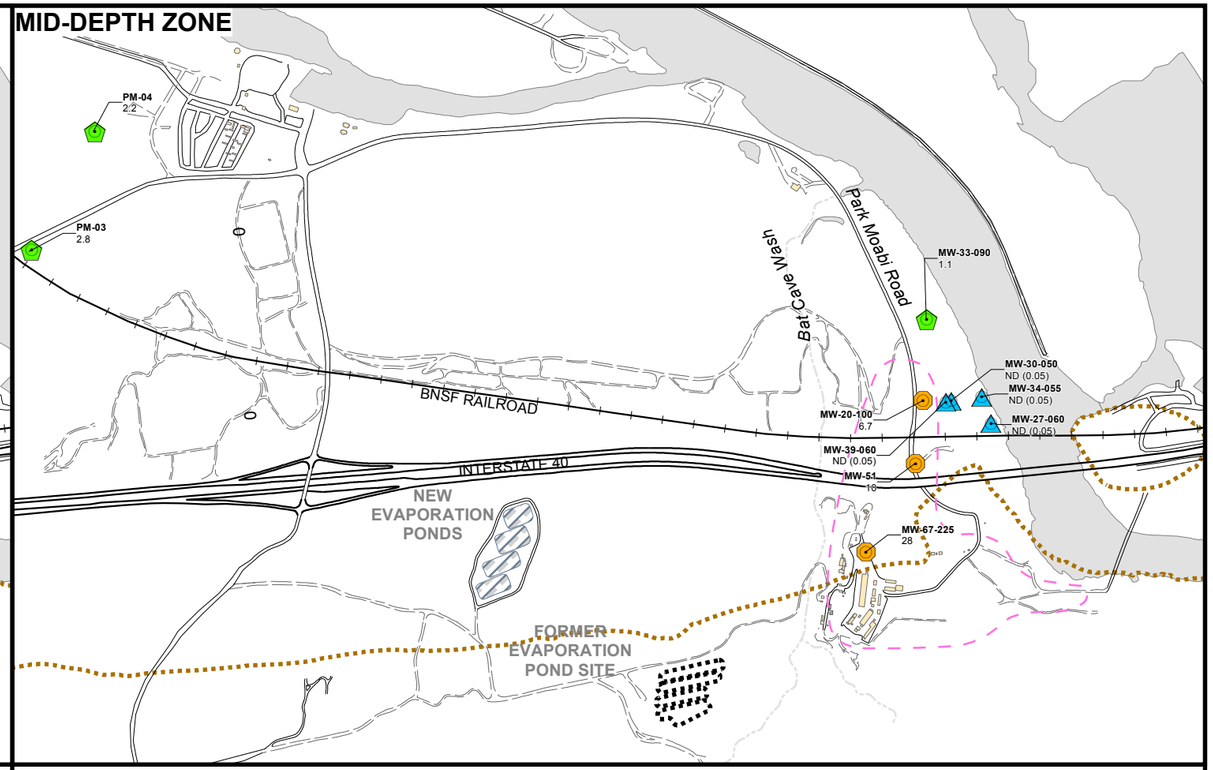
FIGURE **3-2b**

City: Citrix Div/Group: IM Created By: K. SINSABAUGH Last Saved By: Idrum
Topock (RC000753.8020.04182)
Z:\GISProjects_ENV\PGE_Topock\GEC\MXD\GMP\4Q19\FinalFigure3-2b_SE_Results_2019Q4.mxd 3/12/2020 5:20:20 AM

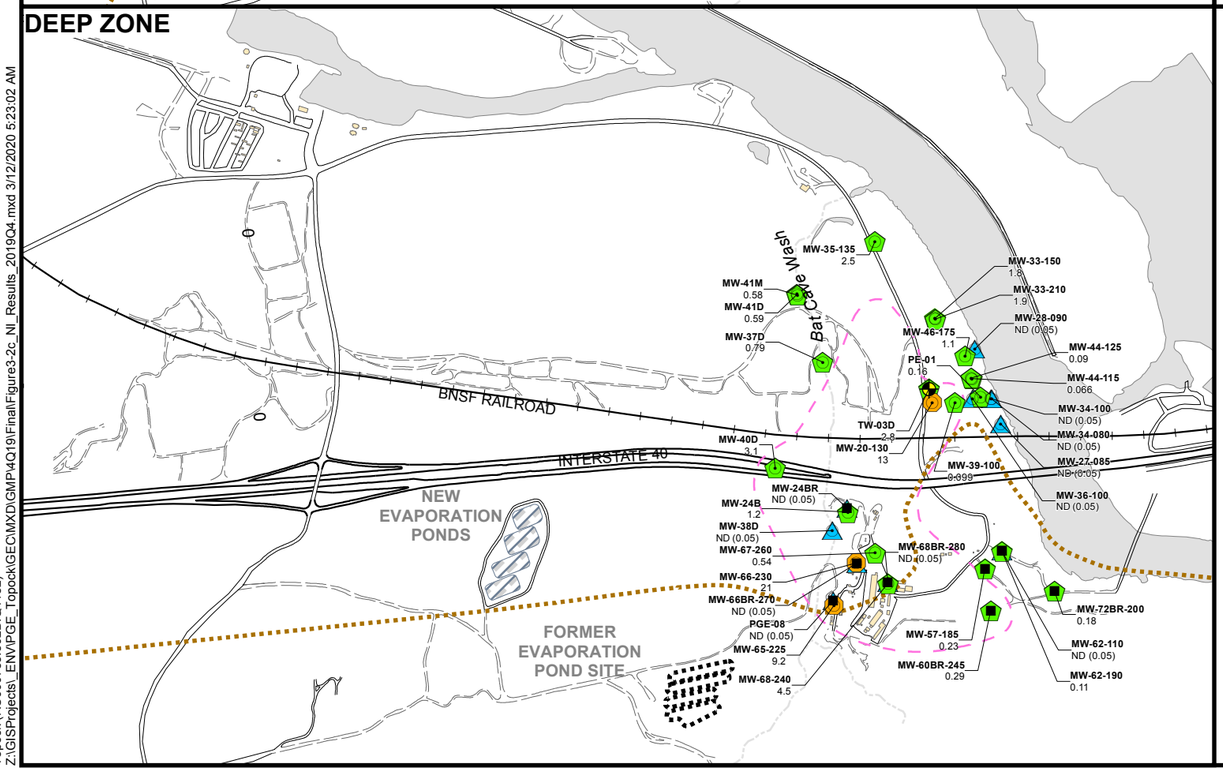
SHALLOW ZONE



MID-DEPTH ZONE



DEEP ZONE



LEGEND

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

Nitrate / Nitrite as Nitrogen Concentrations

- Not detected at analytical reporting limit
- Concentration between reporting limit and 5.03 mg/L
- Concentration ≥ 5.03 mg/L
- Approximate boundary of hexavalent chromium concentrations ≥ 32 µg/L
- Approximate bedrock contact (per depth interval)

MW-68-240 ——— Sampling Location
4.5 ——— Groundwater Nitrate/Nitrite as Nitrogen Concentration (mg/L)

0 1,000 2,000 Feet
GRAPHIC SCALE

N

Notes:

1. ND = Not detected at listed reporting limit
2. mg/L = milligrams per liter
3. µg/L = micrograms per liter
4. ≥ = Greater than or equal to
5. J = The analyte was positively identified: the associated numerical value is the approximate concentration of the analyte in the sample.
6. Results plotted are maximum concentration from primary and duplicate samples.
7. Nitrate/nitrite as nitrogen background study upper tolerance limit (UTL) = 5.03 mg/L. The background study UTL was developed for alluvial wells only.
8. The United States Environmental Protection Agency maximum contaminant level (MCL) for nitrate/nitrite as nitrogen = 10 mg/L. Comparison to the MCL is not shown on the figure.
9. Long-screened wells and wells screened across more than one depth interval are generally not posted on this map.

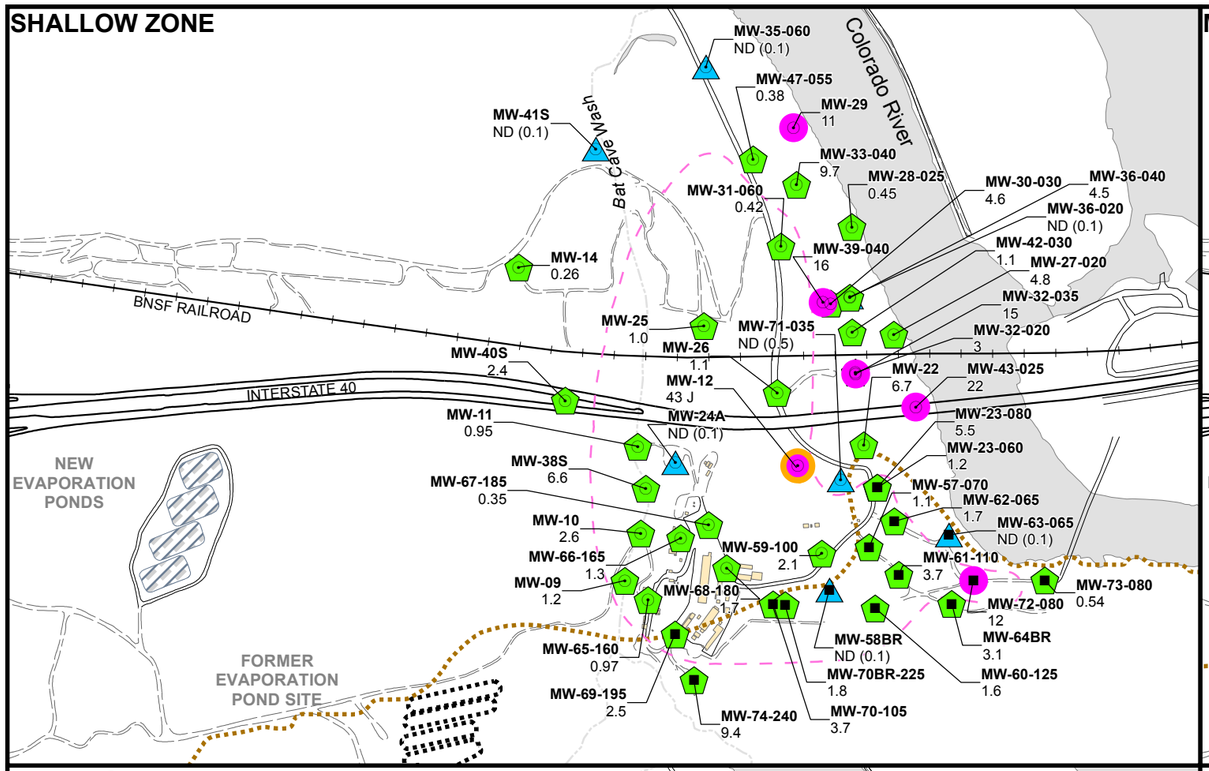
FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

NITRATE / NITRITE AS NITROGEN SAMPLING RESULTS, FOURTH QUARTER 2019

ARCADIS Design & Consultancy for natural and built assets

FIGURE **3-2c**

City: Citrix Div/Group: IM Created By: K. SINSABAUGH Last Saved By: ldrum
Topock (RC000753.8020.Q4182)
Z:\GISProjects_ENV\PGE_Topock\GEC\MXD\GMP4Q19\FinalFigure3-2c_NI_Results_2019Q4.mxd 3/12/2020 5:23:02 AM



LEGEND

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

Dissolved Arsenic Concentrations

- Not detected at analytical reporting limit
- Concentration ≤ 10.0 µg/L
- Concentration > 10.0 µg/L and < 24.3 µg/L
- Concentration ≥ 24.3 µg/L

- Approximate boundary of hexavalent chromium concentrations ≥ 32 µg/L
- Approximate bedrock contact (per depth interval)

MW-68-240 ——— Sampling Location
1.8 ——— Groundwater Dissolved Arsenic Concentration (µg/L)

0 1,000 2,000 Feet
GRAPHIC SCALE

N

Notes:

1. ND = Not detected at listed reporting limit
2. µg/L = micrograms per liter
3. ≤ = Less than or equal to
4. ≥ = Greater than or equal to
5. United States Environmental Protection Agency and California maximum containment level = 10.0 µg/L.
6. Results plotted are maximum concentration from primary and duplicate samples.
7. Dissolved arsenic background study upper tolerance limit (UTL) = 24.3 µg/L. The background study UTL was developed for alluvial wells only.
8. Long-screened wells and wells screened across more than one depth interval are generally not posted on this map.

FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

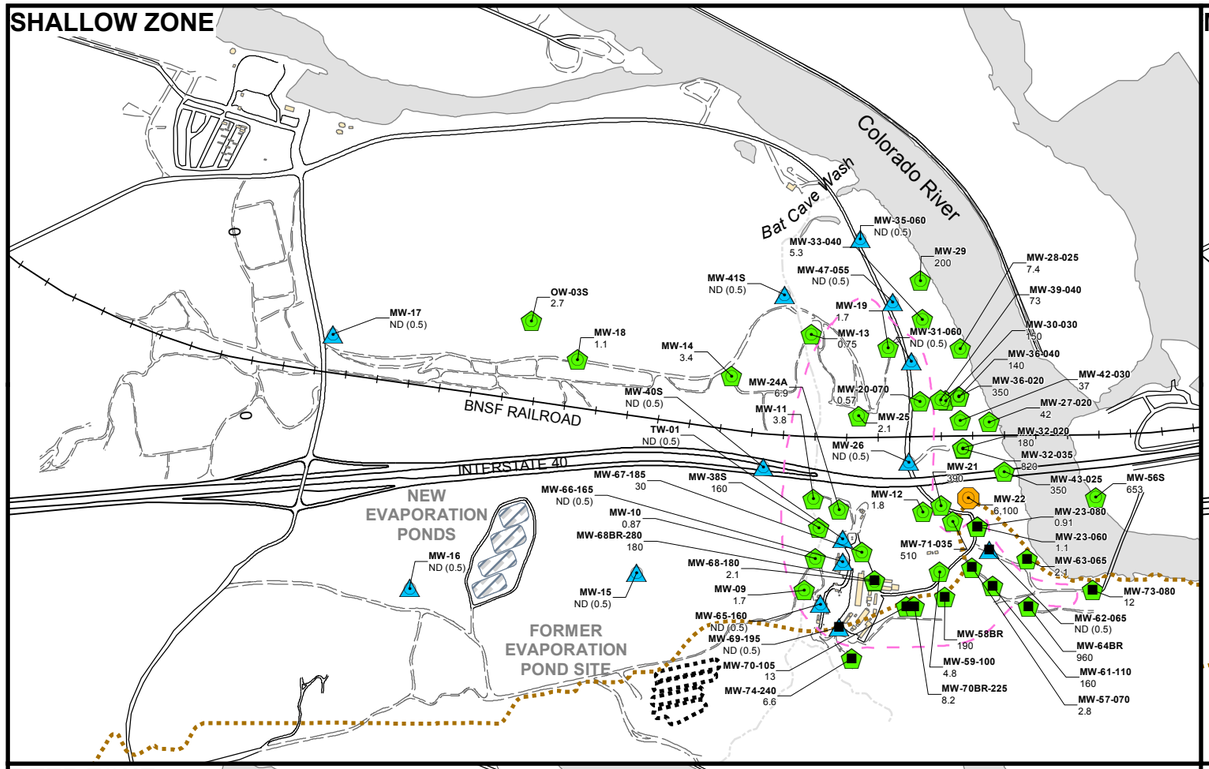
DISSOLVED ARSENIC SAMPLING RESULTS, FOURTH QUARTER 2019

ARCADIS Design & Consultancy for natural and built assets

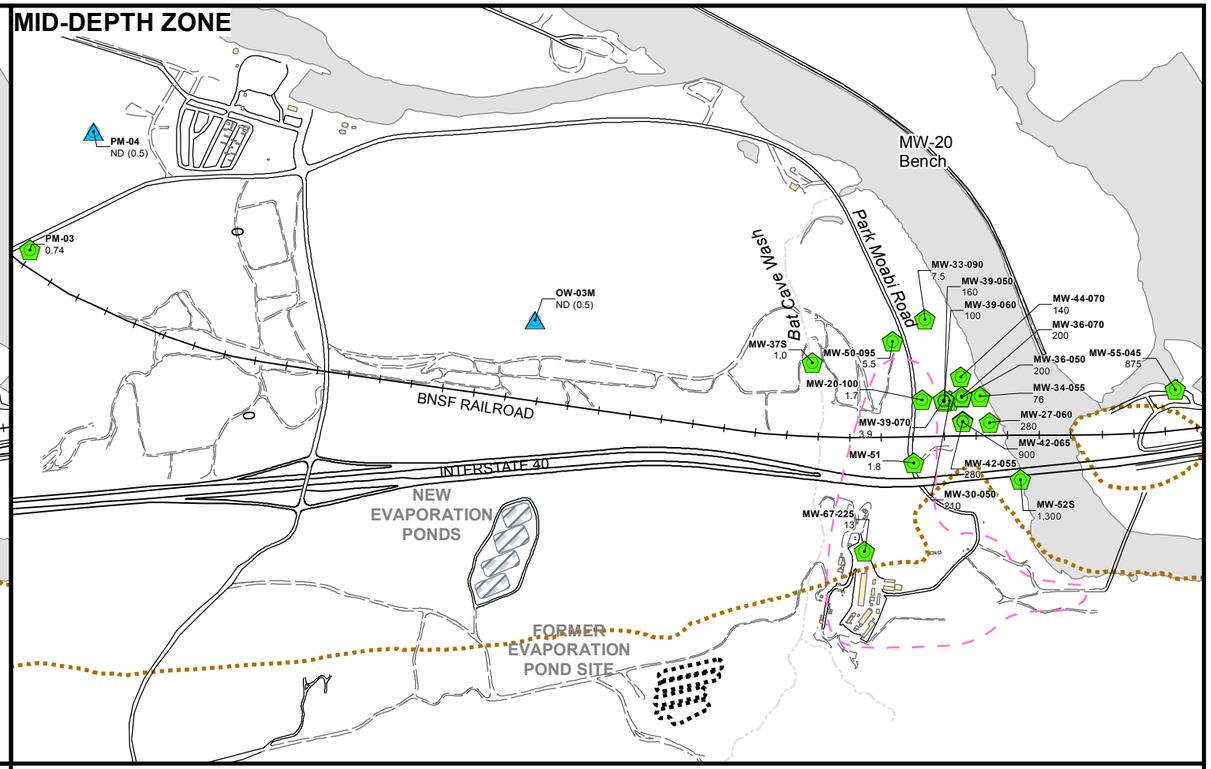
FIGURE **3-2d**

City: Citrix Div/Group: IM Created By: K. SINSABAUGH Last Saved By: Idrum
Topock (RC000753.8020.Q4182)
Z:\GISProjects_ENV\PGE_Topock\GEC\MXD\GMP\4Q19\FinalFigure3-2d_AR_Results_2019Q4.mxd 3/12/2020 8:43:33 AM

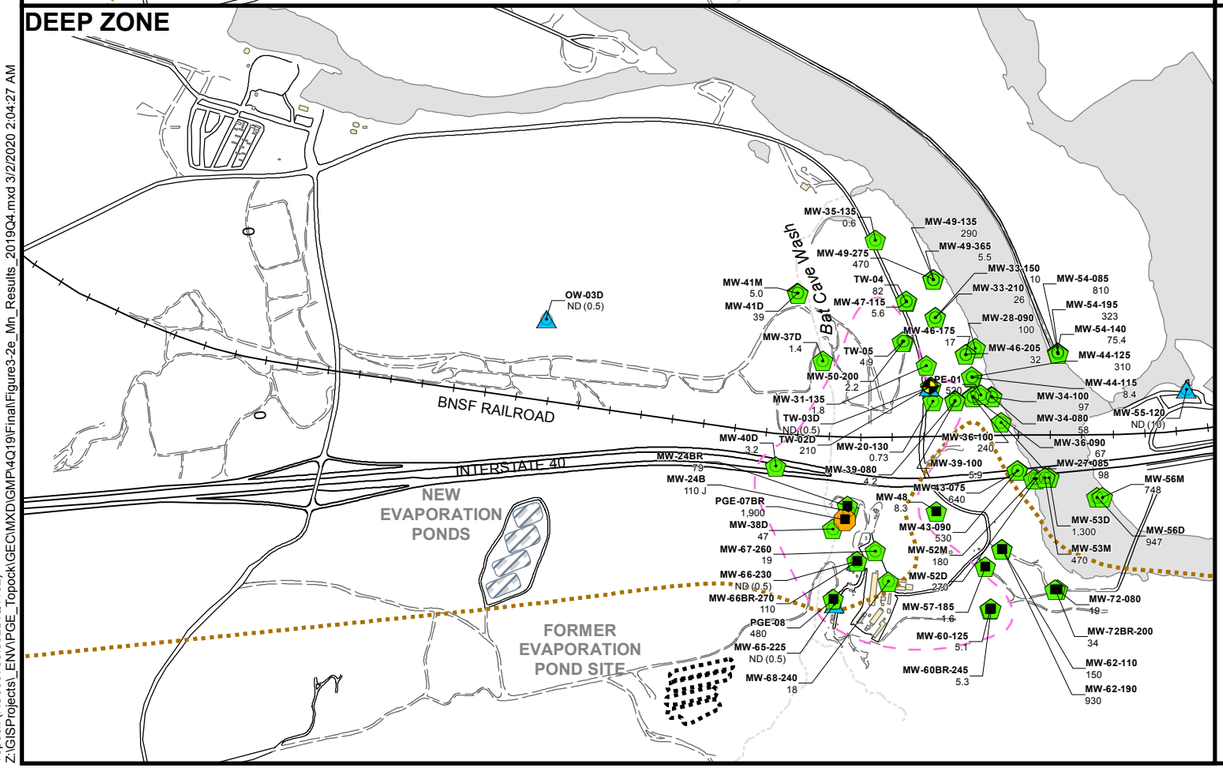
SHALLOW ZONE



MID-DEPTH ZONE



DEEP ZONE



LEGEND

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

Dissolved Manganese Concentrations

- Not detected at analytical reporting limit
- Concentration between reporting limit and 1320 µg/L
- Concentration ≥ 1320 µg/L
- Approximate boundary of hexavalent chromium concentrations ≥ 32 µg/L
- Approximate bedrock contact (per depth interval)

MW-56M ——— Sampling Location
748 ——— Groundwater Dissolved Manganese Concentration (µg/L)

0 1,000 2,000 Feet
GRAPHIC SCALE

N

Notes:

1. ND = Not detected at listed reporting limit (RL)
2. µg/L = micrograms per liter
3. ≥ = Greater than or equal to
4. J = The analyte was positively identified: the associated numerical value is the approximate concentration of the analyte in the sample.
5. Results plotted are maximum concentration from primary and duplicate samples.
6. Dissolved manganese background study upper tolerance limit (UTL) = 1320 µg/L. The background study UTL was developed for alluvial wells only.
7. There is no primary United States Environmental Protection Agency or California maximum contaminant level (MCL) for manganese. The secondary MCL is 50 ug/L. Comparison to the secondary MCL is not shown on the figure.
8. Long-screened wells and wells screened across more than one depth interval are generally not posted on this map.

FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION NEEDLES, CALIFORNIA

DISSOLVED MANGANESE SAMPLING RESULTS, FOURTH QUARTER 2019

ARCADIS Design & Consultancy for natural and built assets

FIGURE **3-2e**

City: Citrix_Div/Group: IM Created By: K. SINSABAUGH Last Saved By: Sharmayh4948
Topock (RC000753.8020.04182)
Z:\GIS\Projects_ENV\PGE_Topock\GEC\MXD\GMP\4Q19\Final\Figure3-2e_Mn_Results_2019Q4.mxd 3/2/2020 2:04:27 AM

MW-35-060	
As	ND (0.1)
Cr(VI)	24
Fe	ND (20)
Mn	ND (0.5)
N	2.1
ORP	51

MW-29	
As	11
Cr(VI)	ND (0.2)
Fe	1200
Mn	200
N	ND (0.05)
ORP	-110

MW-39-040	
As	16
Cr(VI)	ND (0.2)
Fe	-
Mn	73
N	-
ORP	-180

MW-30-030	
As	4.6
Cr(VI)	ND (1.0)
Fe	560
Mn	150
N	0.1
ORP	-32

MW-28-025	
As	0.45
Cr(VI)	ND (0.2)
Fe	30
Mn	7.4
N	ND (0.05)
ORP	13

MW-36-040	
As	4.5
Cr(VI)	ND (0.2)
Fe	880
Mn	140
N	0.062
ORP	-260

MW-33-040	
As	9.7
Cr(VI)	ND (1.0)
Fe	ND (100)
Mn	5.3
N	0.3
ORP	82

MW-36-020	
As	ND (0.1)
Cr(VI)	ND (0.2)
Fe	880
Mn	350
N	-
ORP	-210

MW-47-055	
As	0.38
Cr(VI)	21
Fe	ND (20)
Mn	ND (0.5)
N	-
ORP	77

MW-32-020	
As	3
Cr(VI)	ND (1.0)
Fe	5700
Mn	180
N	-
ORP	-130

MW-19	
As	-
Cr(VI)	130
Fe	130
Mn	1.7
N	-
ORP	240

MW-32-035	
As	15
Cr(VI)	ND (1.0)
Fe	13000
Mn	820
N	0.051
ORP	-130

MW-31-060	
As	0.42
Cr(VI)	370
Fe	29
Mn	ND (0.5)
N	3.5
ORP	-9.9

MW-27-020	
As	4.8
Cr(VI)	ND (0.2)
Fe	2900
Mn	42
N	0.084
ORP	-37

TW-02S	
As	-
Cr(VI)	-
Fe	-
Mn	-
N	-
ORP	-

MW-43-025	
As	22
Cr(VI)	ND (0.2)
Fe	3700
Mn	350
N	-
ORP	-140

MW-25	
As	1
Cr(VI)	74
Fe	130 J
Mn	2.1
N	11
ORP	76

MW-22	
As	6.7
Cr(VI)	ND (1.0)
Fe	21000
Mn	6100
N	-
ORP	-110

MW-20-070	
As	-
Cr(VI)	2300
Fe	-
Mn	0.57
N	11
ORP	-34

MW-24A	
As	ND (0.1)
Cr(VI)	ND (0.2)
Fe	-
Mn	6.9
N	0.074
ORP	-290

MW-26	
As	1.1
Cr(VI)	2300
Fe	28
Mn	ND (0.5)
N	19
ORP	160

MW-42-030	
As	1.1
Cr(VI)	ND (1.0)
Fe	-
Mn	37
N	0.075
ORP	-130

MW-12	
As	43 J
Cr(VI)	1600
Fe	68 J
Mn	1.8
N	14
ORP	52

MW-21	
As	-
Cr(VI)	ND (1.0)
Fe	-
Mn	390
N	0.12
ORP	67

MW-71-035	
As	ND (0.5)
Cr(VI)	ND (1.0)
Fe	270
Mn	510
N	0.051
ORP	60

Colorado River

Bat Cave Wash

BNSF Railroad

40 Interstate

SHALLOW WELLS (UPPER DEPTH INTERVAL) - 2019

MW-39-050	
As	1.7
Cr(VI)	ND (0.2)
Fe	ND (20)
Mn	160
N	-
ORP	24

MW-39-070	
As	-
Cr(VI)	ND (0.2)
Fe	ND (20)
Mn	3.9
N	-
ORP	8.8

MW-33-090	
As	1
Cr(VI)	2.8
Fe	63
Mn	7.5
N	1.1
ORP	73

MW-30-050	
As	2.9
Cr(VI)	ND (0.2)
Fe	68
Mn	210
N	ND (0.05)
ORP	22

MW-39-060	
As	2.4
Cr(VI)	ND (0.2)
Fe	29
Mn	100
N	ND (0.05)
ORP	25

MW-44-070	
As	3.4
Cr(VI)	ND (0.2)
Fe	370
Mn	140
N	-
ORP	-120

MW-50-095	
As	-
Cr(VI)	13
Fe	76
Mn	5.5
N	-
ORP	160

MW-36-070	
As	2
Cr(VI)	ND (0.2)
Fe	39
Mn	200
N	-
ORP	-240

MW-20-100	
As	-
Cr(VI)	750
Fe	-
Mn	1.7
N	6.7
ORP	-40

MW-36-050	
As	5.2
Cr(VI)	ND (0.2)
Fe	180
Mn	200
N	-
ORP	-230

MW-43-025	
As	22
Cr(VI)	ND (0.2)
Fe	3700
Mn	350
N	-
ORP	-140

MW-42-055	
As	22
Cr(VI)	ND (0.2)
Fe	360
Mn	280
N	-
ORP	-84

MW-42-065	
As	8.2
Cr(VI)	ND (0.2)
Fe	55
Mn	900
N	-
ORP	60

MW-51	
As	3.9
Cr(VI)	3600
Fe	ND (100)
Mn	1.8
N	10
ORP	200

MW-34-055	
As	2.9
Cr(VI)	ND (0.2)
Fe	94
Mn	76
N	ND (0.05)
ORP	-85

MW-27-060	
As	9.6
Cr(VI)	ND (0.2)
Fe	560
Mn	280
N	ND (0.05)
ORP	-110

MW-52S	
As	0.29
Cr(VI)	ND (0.2)
Fe	17000
Mn	1300
N	-
ORP	-86

Park Moabi Road

Bat Cave Wash

40 Interstate

MID-DEPTH WELLS (MIDDLE DEPTH INTERVAL) - 2019

MW-35-135	
As	0.95
Cr(VI)	28
Fe	ND (100)
Mn	0.6
N	2.5
ORP	35

MW-49-135	
As	1.6
Cr(VI)	1.7
Fe	350
Mn	290
N	-
ORP	-160

MW-49-365	
As	-
Cr(VI)	ND (1.0)
Fe	ND (100)
Mn	5.5
N	-
ORP	150

MW-49-275	
As	-
Cr(VI)	ND (1.0)
Fe	190
Mn	470
N	-
ORP	120

MW-54-195	
As	ND (1.0)
Cr(VI)	ND (0.5)
Fe	ND (50)
Mn	323
N	-
ORP	-270

MW-54-140	
As	ND (1.0)
Cr(VI)	ND (0.5)
Fe	ND (50)
Mn	75.4
N	-
ORP	-6.1

MW-33-150	
As	1
Cr(VI)	2
Fe	84
Mn	10
N	1.8
ORP	110

MW-28-090	
As	1.7
Cr(VI)	ND (0.2)
Fe	510
Mn	100
N	ND (0.05)
ORP	-65

MW-54-085	
As	ND (1.0)
Cr(VI)	ND (0.1)
Fe	ND (50)
Mn	810
N	-
ORP	15

MW-33-210	
As	1.2
Cr(VI)	13
Fe	ND (100)
Mn	26
N	1.9
ORP	110

MW-46-205	
As	-
Cr(VI)	ND (1.0)
Fe	ND (100)
Mn	32
N	-
ORP	140

MW-47-115	
As	-
Cr(VI)	16
Fe	ND (100)
Mn	5.6
N	-
ORP	21

MW-50-200	
As	3.3
Cr(VI)	2200
Fe	130
Mn	2.2
N	-
ORP	230

MW-44-125	
As	4.9
Cr(VI)	2.6
Fe	250
Mn	310
N	0.09
ORP	-47

MW-44-115	
As	5.6
Cr(VI)	6.7
Fe	ND (100)
Mn	8.4
N	0.066
ORP	-11

MW-31-135	
As	3.6
Cr(VI)	13
Fe	ND (100)
Mn	1.8
N	-
ORP	-130

TW-02D	
As	-
Cr(VI)	2.3
Fe	770
Mn	210
N	-
ORP	200

MW-27-085	
As	ND (0.1)
Cr(VI)	ND (0.2)
Fe	140
Mn	98
N	ND (0.05)
ORP	-25

TW-03D	
As	-
Cr(VI)	480
Fe	ND (100)
Mn	ND (0.5)
N	2.8
ORP	200

MW-20-130	
As	4.6 J
Cr(VI)	5900
Fe	-
Mn	0.73
N	13
ORP	-120

MW-43-075	
As	12
Cr(VI)	ND (1.0)
Fe	3500
Mn	640
N	-
ORP	-130

MW-39-080	
As	-
Cr(VI)	0.52
Fe	120
Mn	4.2
N	-
ORP	-210

MW-34-100	
As	1.6
Cr(VI)	ND (1.0)
Fe	470
Mn	97
N	ND (0.05)
ORP	-67

MW-39-100	
As	2.2
Cr(VI)	87
Fe	27
Mn	5.9
N	0.099
ORP	30

MW-34-080	
As	ND (0.1)
Cr(VI)	ND (0.2)
Fe	170
Mn	58
N	ND (0.05)
ORP	-41

MW-53D	
As	ND (0.5)
Cr(VI)	ND (1.0)
Fe	540
Mn	1300
N	-
ORP	-94

MW-36-090	
As	2.1
Cr(VI)	ND (0.2)
Fe	30
Mn	67
N	-
ORP	-210

MW-36-100	
As	0.81
Cr(VI)	7.5
Fe	220
Mn	240
N	ND (0.05)
ORP	-230

PE-01	
As	-
Cr(VI)	ND (0.2)
Fe	7500
Mn	520
N	0.16
ORP	180

MW-52M	
As	1.3
Cr(VI)	ND (1.0)
Fe	1400
Mn	180
N	-
ORP	-130

MW-52D	
As	2.5
Cr(VI)	ND (1.0)
Fe	620
Mn	270
N	-
ORP	-140

MW-53M	
As	0.84
Cr(VI)	ND (1.0)
Fe	420
Mn	470
N	-
ORP	-150

DEEP WELLS (LOWER DEPTH INTERVAL) - 2019

LEGEND

- Approximate limit of reducing groundwater based upon a combination of redox indicator parameters and historical data trends
- Groundwater ORP < -90mV
- -90 mV< Groundwater ORP < 1 mV
- Groundwater ORP > 1 mV
- IM-3 Extraction Wells (TW-02S, TW-02D, TW-03D, and PE-01)

Notes:

1. ND = 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. mg/L - milligrams per liter
4. mV = millivolts
5. µg/L = micrograms per liter
6. < = Less than
7. > = Greater than

Location ID	
As	Dissolved arsenic (µg/L)
Cr(VI)	Hexavalent chromium (µg/L)
Fe	Dissolved iron (µg/L)
Mn	Dissolved manganese (µg/L)
N	Nitrate/nitrite as nitrogen (mg/L)
ORP	Oxidation reduction potential (mV)

0 400 800 Feet

GRAPHIC SCALE

N

FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

DISTRIBUTION OF CR(VI), GEOCHEMICAL INDICATOR PARAMETERS, AND IN-SITU BY-PRODUCTS IN FLOODPLAIN WELLS, FOURTH QUARTER 2019

ARCADIS Design & Consultancy for natural and built assets

FIGURE 4-1

City: Citrix Div/Group: IM Created By: K. SINSABAUGH Last Saved By: Idrum
Topock (RC000753.8022D.04182)
Z:\GIS\Projects_ENV\PGE_Topock\GEC\MXD\GMP\4Q19\Final\Figure4-1_Floodplain_Wells_20190Q4.mxd 3/12/2020 9:54:18 AM

West

East
Section A

TW-02S
TW-02D
projected: 140'

TW-03D
projected: 130'

MW-020-070
MW-020-100
MW-020-130

MW-39-040
MW-39-050
MW-39-060
MW-39-070
MW-39-080
MW-39-100

MW-030-030
MW-030-050

MW-36-020
MW-36-040
MW-36-050
MW-36-070
MW-36-090
MW-36-100

PE-01

MW-34-055
MW-34-080
MW-34-100

Colorado River

static water level (no pumping)

Upper Depth Interval

Middle Depth Interval

Lower Depth Interval

ALLUVIAL AQUIFER

Approximate contact between alluvial fan (west) and fluvial (east) deposits

Elevation (feet AMSL)

550
500
450
400
350
300
250

NM
2,300
-34
11
0.57
NM
NM

750
-40
6.7
1.7
NM
NM

5,900
-120
13
0.73
NM
4.6 J

480
200
2.8
ND (0.5)
ND (100)
NM

2.3
200
NM
210
770
NM

ND (0.2)
24
NM
160
ND (20)
1.7

ND (0.2)
8.8
NM
3.9
ND (20)
NM

87
30
0.099
5.9
27
2.2

ND (0.2)
-180
NM
73
NM
16

ND (0.2)
25
ND (0.05)
100
29
2.4

0.52
-210
NM
4.2
120
NM

ND (1.0)
-32
0.1
150
560
4.6

ND (0.2)
22
ND (0.05)
210
68
2.9

ND (0.2)
-260
0.062
140
880
4.5

ND (0.2)
-240
NM
200
39
2

7.5
-230
ND (0.05)
240
220
0.81

ND (0.2)
-210
NM
350
880
ND (0.1)

ND (0.2)
-230
NM
200
180
5.2

ND (0.2)
-210
NM
67
30
2.1

ND (0.2)
180
0.16
520
7,500
NM

ND (0.2)
-85
ND (0.05)
76
94
2.9

ND (0.2)
-41
ND (0.05)
58
170
ND (0.1)

ND (1.0)
-67
ND (0.05)
97
470
1.6

132'
157'
180'
67'
118'
108'
105'
116'

?
?

Miocene Conglomerate
(Bedrock)

True-Scale (No Vertical Exaggeration)

0
100
200
300
400
500
600
700

Distance (feet)

Legend

water level

well screen

boring depth (feet)

550
100
3
12
ND (20)
NM
157'

Groundwater Results

Hexavalent chromium, micrograms per liter (µg/L)
Oxidation reduction potential (ORP), millivolts (mV)
Nitrate/Nitrite as nitrogen, milligrams per liter (mg/L)
Dissolved manganese (Mn), (µg/L)
Dissolved iron (Fe), (µg/L)
Dissolved arsenic (As), (µg/L)

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

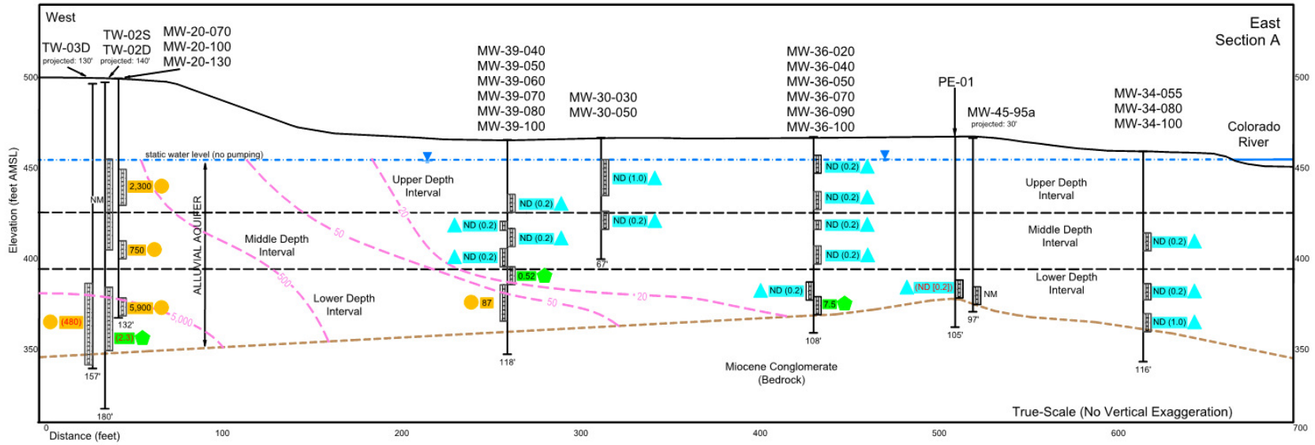
Notes:
> = greater than
< = less than
J = concentration or reporting limit estimated by laboratory or data validation
ND = not detected at listed reporting limit
NM = not measured
Groundwater ORP < -90 mV
-90 mV < Groundwater ORP < 1 mV
Groundwater ORP > 1 mV

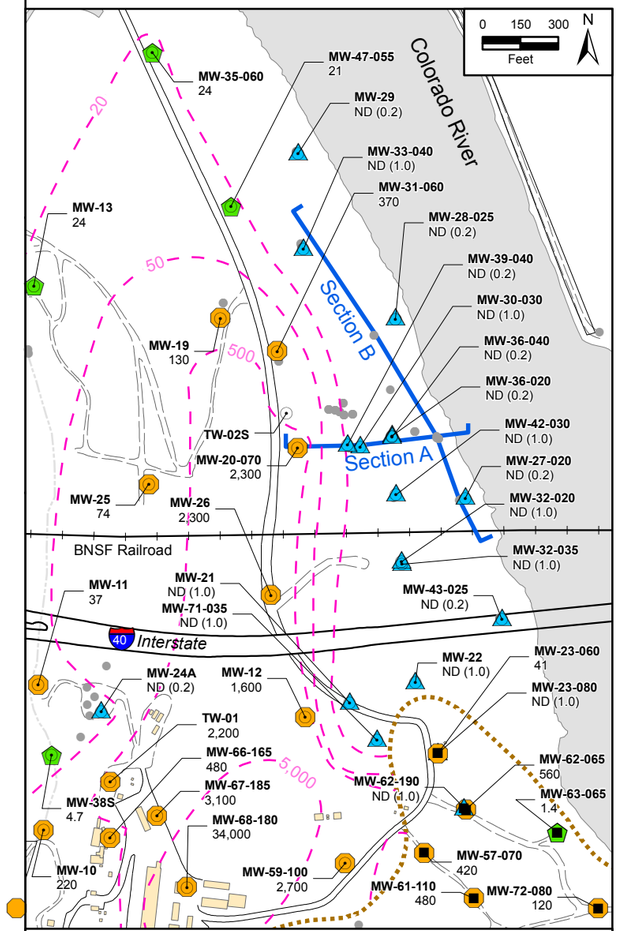
FOURTH QUARTER 2019 AND ANNUAL INTERIM-MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

DISTRIBUTION OF CR(VI), GEOCHEMICAL INDICATOR PARAMETERS, AND IN-SITU BYPRODUCTS IN FLOODPLAIN WELLS CROSS-SECTION A, FOURTH QUARTER 2019

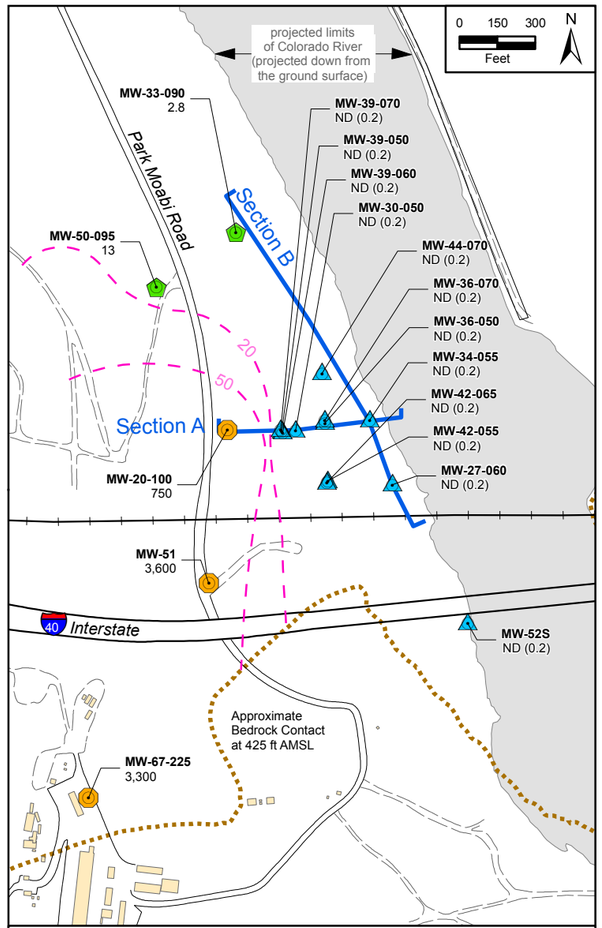
ARCADIS Design & Consultancy for natural and built assets

FIGURE
4-2

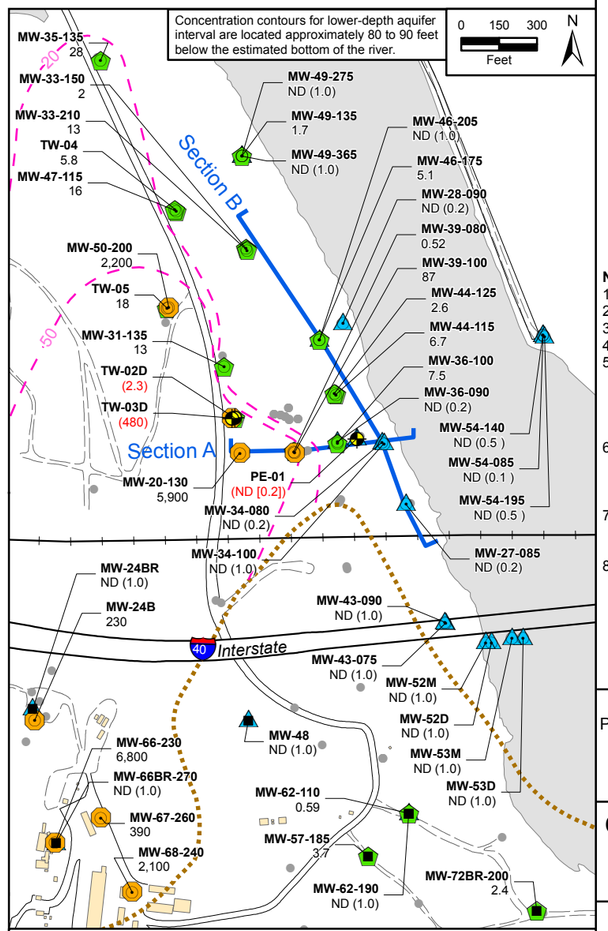




Shallow Wells (Upper Depth Interval)



Mid-Depth Wells (Middle Depth Interval)



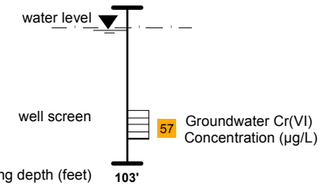
Deep Wells (Lower Depth Interval)

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
- 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



MW-11 — Sampling Location
37 — Groundwater Cr(VI) Concentration (µg/L)
(140) — Groundwater Cr(VI) Concentration (µg/L) not used for contouring

Notes:

1. ND = Cr(VI) not detected at analytical reporting limit.
2. µg/L = micrograms per liter
3. ≥ = greater than or equal to
4. Cr(VI) = Hexavalent Chromium
5. The Cr(VI) concentration contours of 20 and 50 µg/L are shown in accordance with Department of Toxic Substances Control's 2005 Interim Measure performance monitoring directive, which was established for containment of Cr(VI) concentrations greater than 20 µg/L in the floodplain portion of the Alluvial Aquifer.
6. The Cr(VI) contours are estimated based on available groundwater analytical results from Fourth Quarter 2018 and the current quarter. There are no data confirming the existence of Cr(VI) under the Colorado River.
7. 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.
8. Long-screened wells and wells screened across more than one depth interval are generally not posted on this map.

FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT

PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CR(VI) CONCENTRATIONS IN ALLUVIAL AQUIFER AND BEDROCK, FOURTH QUARTER 2019

ARCADIS Design & Consultancy for natural and built assets

FIGURE
5-1

Z:\GISPROJECTS_ENV\PGE_TOPOCK\GEC\MXD\GMP\4Q19\FINAL\FIGURE5-1_GMP_CR6_2019Q4_MAX.MXD 3/12/2020 9:24:24 AM

North

South
Section B

Cross-Section Parallel to the Colorado River

BNSF
Railroad

MW-33-040
MW-33-090
MW-33-150
MW-33-210

MW-46-175
MW-46-205

MW-28-025
MW-28-090
projected: 110'

MW-44-070
MW-44-115
MW-44-125

MW-34-055
MW-34-080
MW-34-100

MW-27-020
MW-27-060
MW-27-085

Elevation (feet AMSL)

700
600
500
400
300
200
100
0

water table (average 455' AMSL)

Upper Depth Interval
Middle Depth Interval
Lower Depth Interval

ALLUVIAL AQUIFER

Oldest Alluvium

Fluvial Deposits

Approximate geologic contact between alluvial fan and (0.2) fluvial deposits

ND (1)
2.8
2.0
13
237'

ND (0.2)
ND (0.2)
5.1
ND (1)
216'

ND (0.2)
ND (0.2)
6.7
2.6
134'

Upper Depth Interval
ND (0.2)
Middle Depth Interval
ND (0.2)
ND (0.2)
Lower Depth Interval
ND (1)
116'

ND (0.2)
ND (0.2)
ND (0.2)
107'

Miocene Conglomerate
(Bedrock)

True-Scale (No Vertical Exaggeration)

-100 0 100 200 300 400 500 600 700 800 900 1,000 1,100 1,200 1,300 1,400
Distance (feet)

Notes:
AMSL = above mean sea level.
µg/L = micrograms per liter.
ND = not detected at listed reporting limit.
≥ = greater than or equal to.
Cr(VI) = hexavalent chromium.

1. See Figure 5-1 for location of this cross-section.

Legend

water level
well screen
boring depth (feet)
103'
14
Groundwater Cr(VI) Concentration (µg/L)

20
Inferred hexavalent chromium contours (µg/L) in Alluvial Aquifer.

Cr(VI) Concentrations

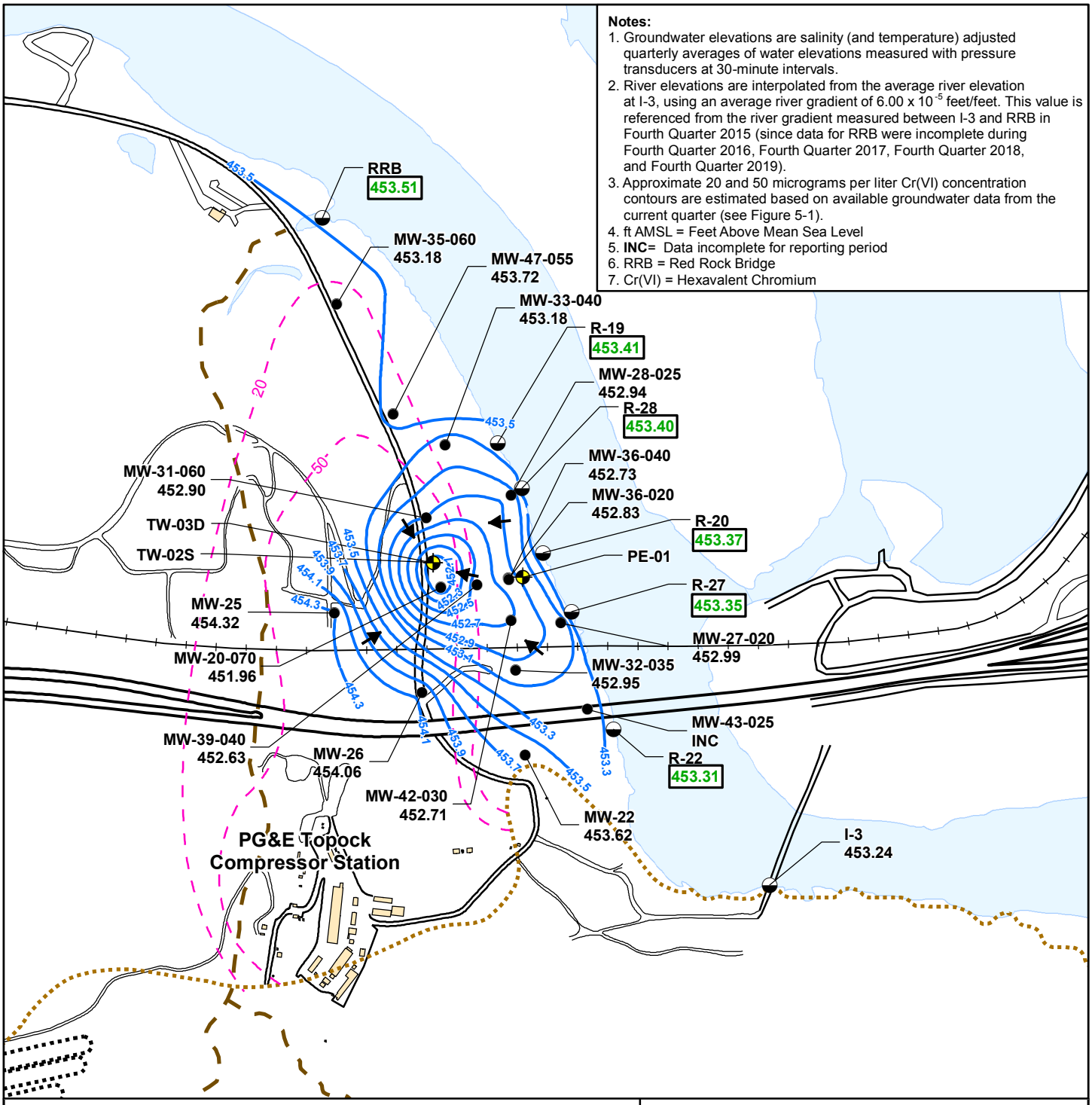
- Not detected at analytical reporting limit
- Concentration between reporting limit and 32 µg/L
- Concentration ≥ 32 µg/L

FOURTH QUARTER 2019 AND ANNUAL INTERIM-MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

Cr(VI) CONCENTRATIONS FLOODPLAIN CROSS-SECTION B, FOURTH QUARTER 2019

ARCADIS Design & Consultancy for natural and built assets

FIGURE
5-2



Notes:

1. Groundwater elevations are salinity (and temperature) adjusted quarterly averages of water elevations measured with pressure transducers at 30-minute intervals.
2. River elevations are interpolated from the average river elevation at I-3, using an average river gradient of 6.00 x 10^{-5} feet/feet. This value is referenced from the river gradient measured between I-3 and RRB in Fourth Quarter 2015 (since data for RRB were incomplete during Fourth Quarter 2016, Fourth Quarter 2017, Fourth Quarter 2018, and Fourth Quarter 2019).
3. Approximate 20 and 50 micrograms per liter Cr(VI) concentration contours are estimated based on available groundwater data from the current quarter (see Figure 5-1).
4. ft AMSL = Feet Above Mean Sea Level
5. **INC**= Data incomplete for reporting period
6. RRB = Red Rock Bridge
7. Cr(VI) = Hexavalent Chromium

LEGEND

- Monitoring Well
- River Station
- Extraction Well
- Bedrock Contact at 455 ft AMSL Elevation
- Interpreted Groundwater Flow Direction
- Groundwater Elevation Contour 0.2 ft (dashed where inferred)
- Inferred Cr(VI) concentration (micrograms per liter) contour

0 800 1,600

Feet

MW-47-055 —— Gauging Location
453.72 —— Average Groundwater Elevation (ft AMSL)

R-27 —— River Station
453.35 —— River Elevation (ft AMSL) Interpolated Average

FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT

PG&E TOPOCK COMPRESSOR STATION NEEDLES, CALIFORNIA

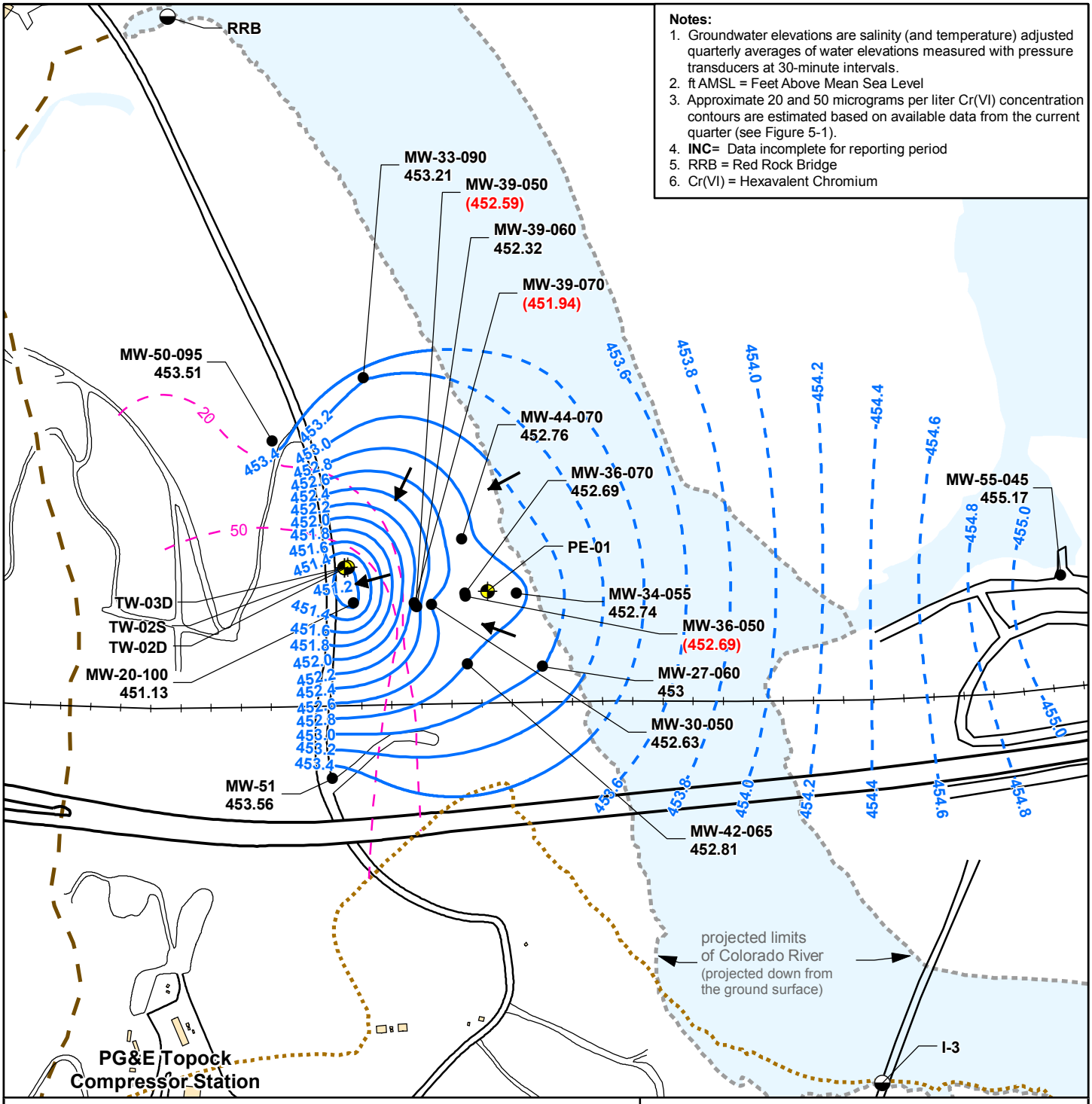
AVERAGE GROUNDWATER ELEVATIONS IN SHALLOW WELLS AND RIVER ELEVATIONS, FOURTH QUARTER 2019

ARCADIS Design & Consultancy for natural and built assets

FIGURE

5-3a

Z:\GISPROJECTS_ENV\PGE_TOPOCK\GEC\MXD\GMP\4Q19\FINAL\FIGURE5-3A_GWE_SHALLOW_2019Q4.MXD 3/2/2020 9:10:55 PM



Notes:

1. Groundwater elevations are salinity (and temperature) adjusted quarterly averages of water elevations measured with pressure transducers at 30-minute intervals.
2. ft AMSL = Feet Above Mean Sea Level
3. Approximate 20 and 50 micrograms per liter Cr(VI) concentration contours are estimated based on available data from the current quarter (see Figure 5-1).
4. **INC=** Data incomplete for reporting period
5. RRB = Red Rock Bridge
6. Cr(VI) = Hexavalent Chromium

LEGEND

- Monitoring Well
- River Location
- Extraction Well
- Bedrock Contact at 425 ft AMSL Elevation
- Interpreted Groundwater Flow Direction
- Groundwater Elevation Contour 0.2 ft (dashed where inferred)
- Inferred Cr(VI) concentration (micrograms per liter) contour

0 500 1,000
Feet

MW-30-050 ——— Gauging Location
452.63 ——— Average Groundwater Elevation (ft AMSL)
(452.69) ——— Elevation in red parentheses not used for contouring

FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT

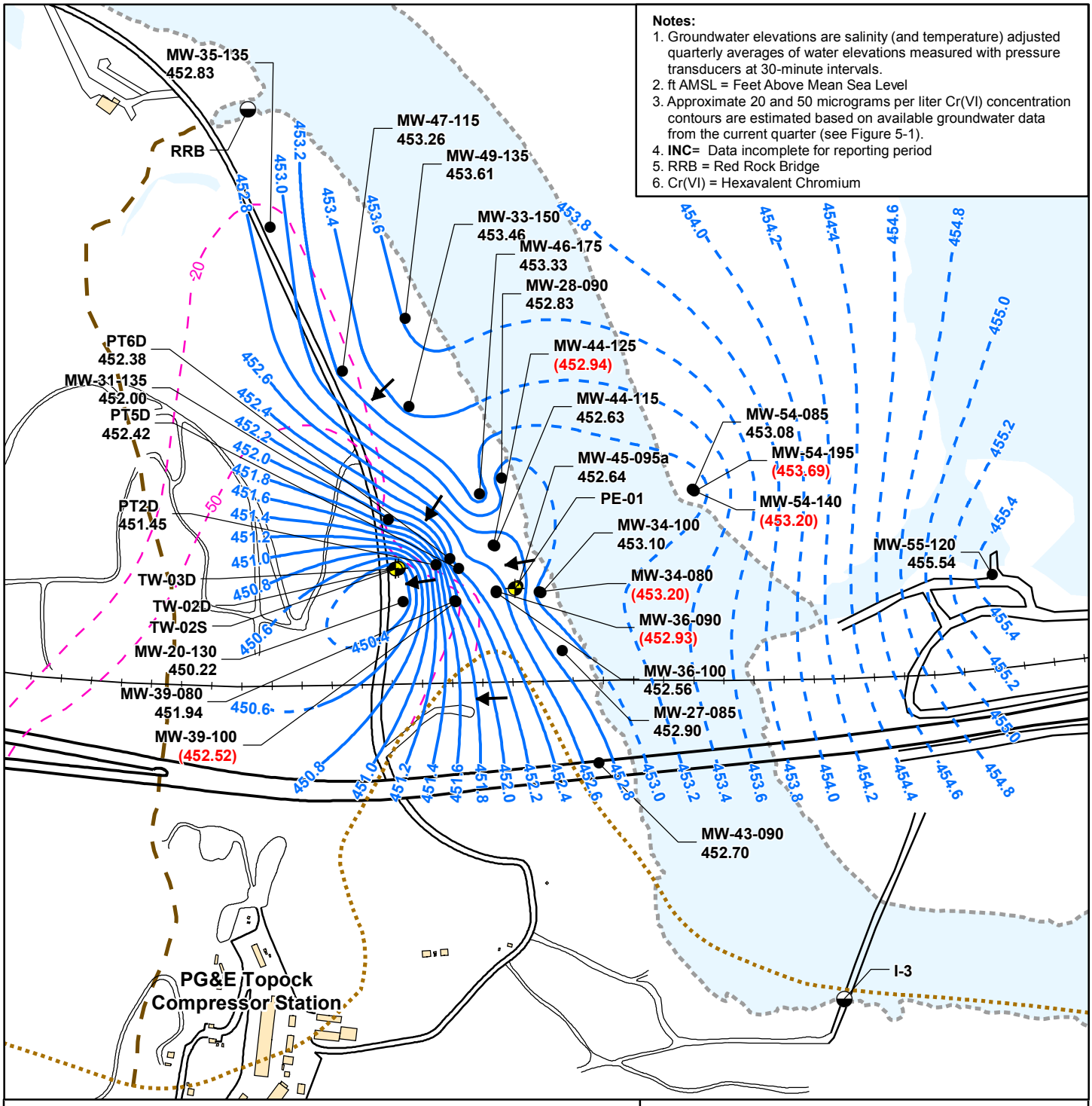
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

AVERAGE GROUNDWATER ELEVATIONS IN MID-DEPTH WELLS, FOURTH QUARTER 2019

ARCADIS Design & Consultancy for natural and built assets

FIGURE
5-3b

Z:\GISPROJECTS_ENV\PGE_TOPOCK\GEC\MXD\GMP\4Q19\FINAL\FIGURE5-3B_GWE_MIDDEPTH_2019Q4.MXD 3/2/2020 9:12:49 PM



Notes:

1. Groundwater elevations are salinity (and temperature) adjusted quarterly averages of water elevations measured with pressure transducers at 30-minute intervals.
2. ft AMSL = Feet Above Mean Sea Level
3. Approximate 20 and 50 micrograms per liter Cr(VI) concentration contours are estimated based on available groundwater data from the current quarter (see Figure 5-1).
4. **INC=** Data incomplete for reporting period
5. RRB = Red Rock Bridge
6. Cr(VI) = Hexavalent Chromium

LEGEND

- Monitoring Well
- River Location
- Extraction Well
- Bedrock Contact at 396 ft AMSL Elevation
- Interpreted Groundwater Flow Direction
- Groundwater Elevation Contour 0.2 ft (dashed where inferred)
- Inferred Cr(VI) concentration (micrograms per liter) contour

0 600 1,200
Feet

MW-28-090 — Gauging Location
452.83 — Average Groundwater Elevation (ft AMSL)
(453.20) — Elevation in red parentheses not used for contouring

FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT

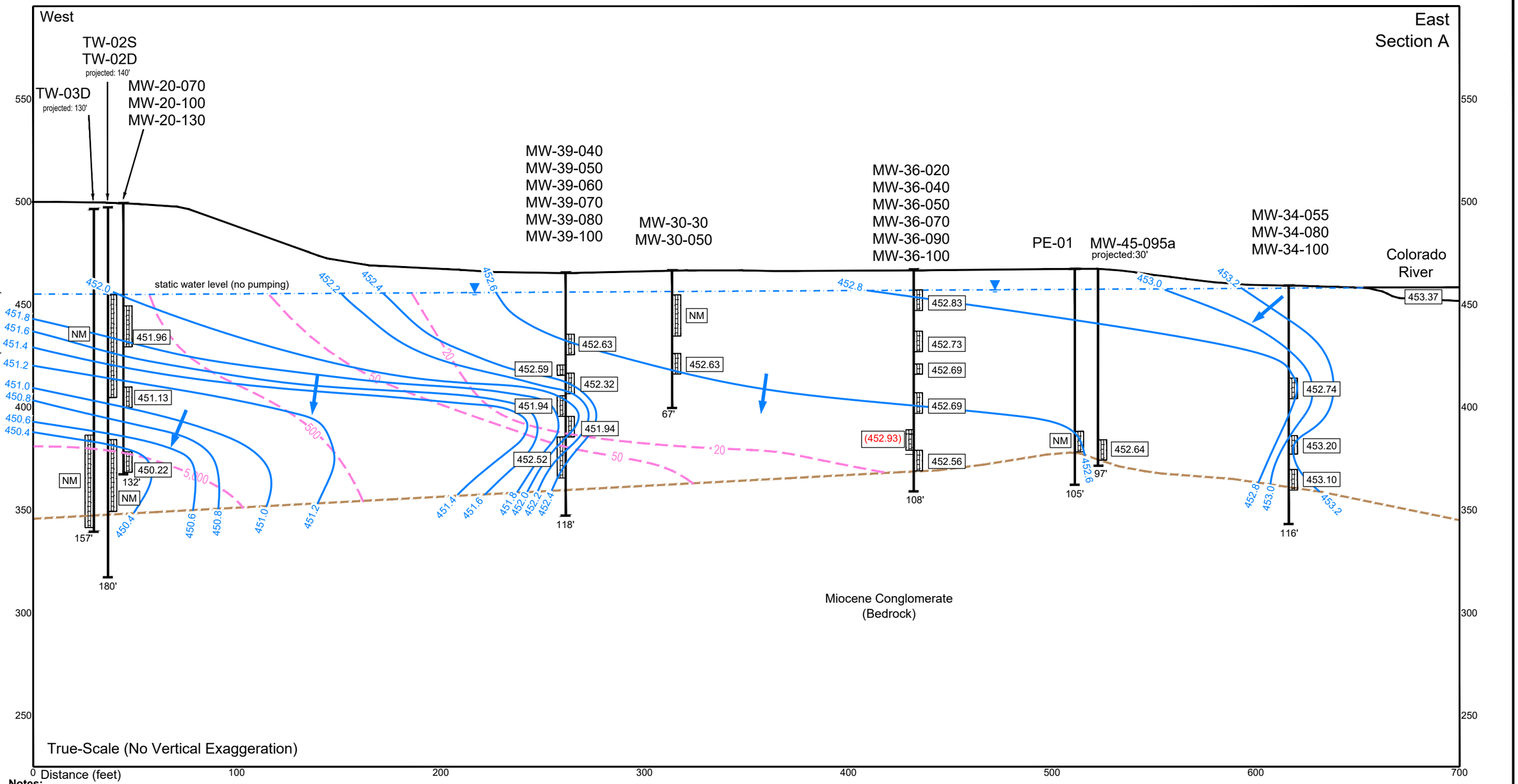
PG&E TOPOCK COMPRESSOR STATION NEEDLES, CALIFORNIA

AVERAGE GROUNDWATER ELEVATIONS IN DEEP WELLS, FOURTH QUARTER 2019

ARCADIS Design & Consultancy for natural and built assets

FIGURE
5-3c

Z:\GISPROJECTS_ENV\PGE_TOPOCK\GEC\MXD\GMP\4Q19\FINAL\FIGURE5-3C_GWE_DEEP_2019Q4.MXD 2/27/2020 11:27:29 PM



Notes:

1. Results show average groundwater elevations for November and December 2019 measured with pressure transducers at 30-minute intervals.
2. Groundwater elevations are adjusted for salinity and temperature.
3. Colorado River elevation shown as interpolated Fourth Quarter 2019 average from R-20 river monitoring location.
4. The hexavalent chromium contour lines are from Figure 5-1.
5. Groundwater elevations shown in red parenthesis are not used for contouring.

AMSL = above mean sea level.
NM = well not measured or used in contouring.
ppb = concentration in parts per billion
INC = quarterly pressure transducer data incomplete due to malfunction, inaccessibility, or low water level conditions

Legend

MW-030-050

Inferred water table

well screen and associated average groundwater elevation (feet AMSL)

453.66

boring depth (feet)

67'

20

Inferred hexavalent chromium contour (ppb) in Alluvial Aquifer based on Current Quarter

453.2

Inferred groundwater head contour

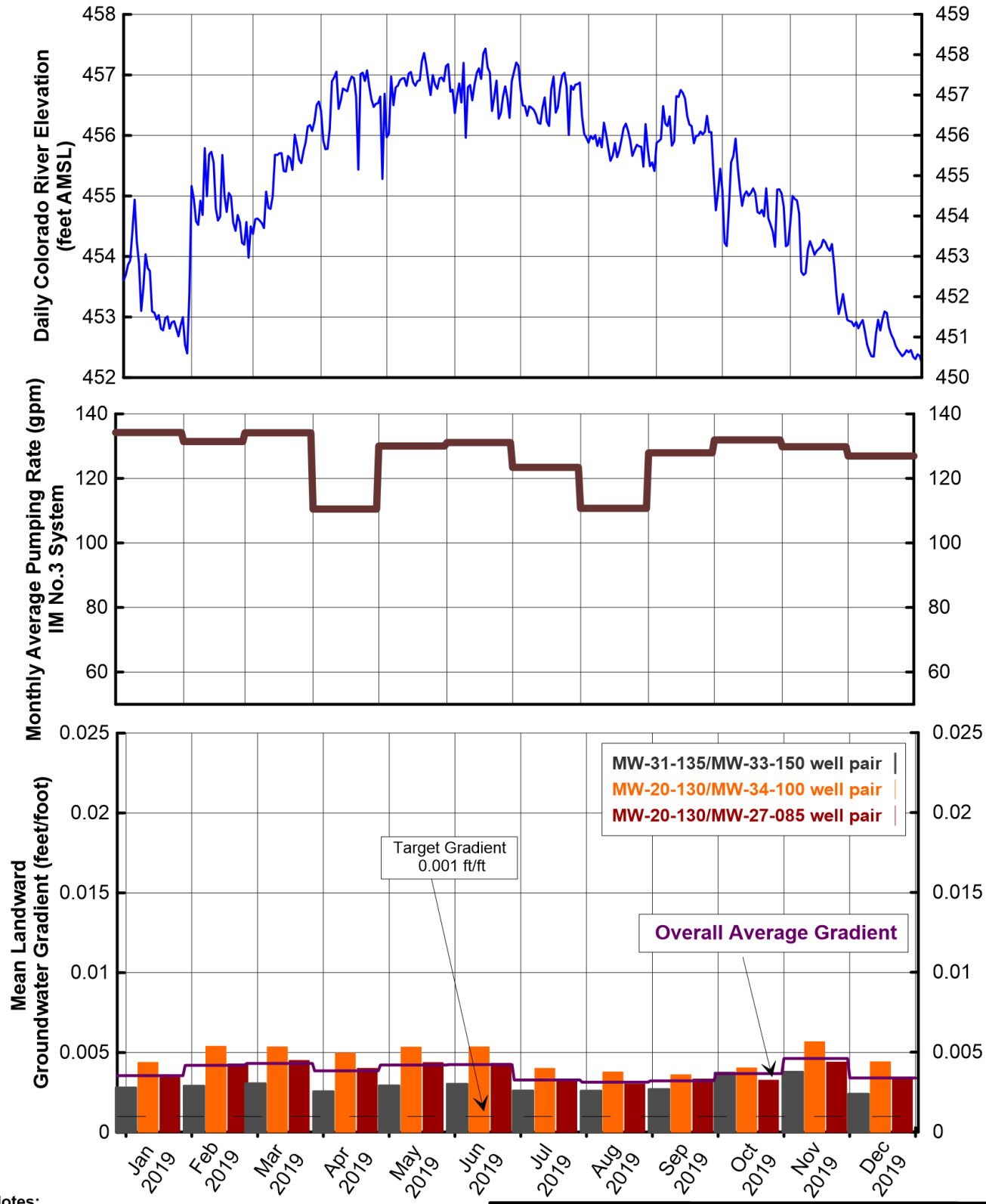
Interpreted groundwater flow direction

FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

AVERAGE GROUNDWATER ELEVATIONS FOR WELLS IN FLOODPLAIN CROSS-SECTION A, FOURTH QUARTER 2019

ARCADIS Design & Consultancy for natural and built assets

FIGURE
5-4



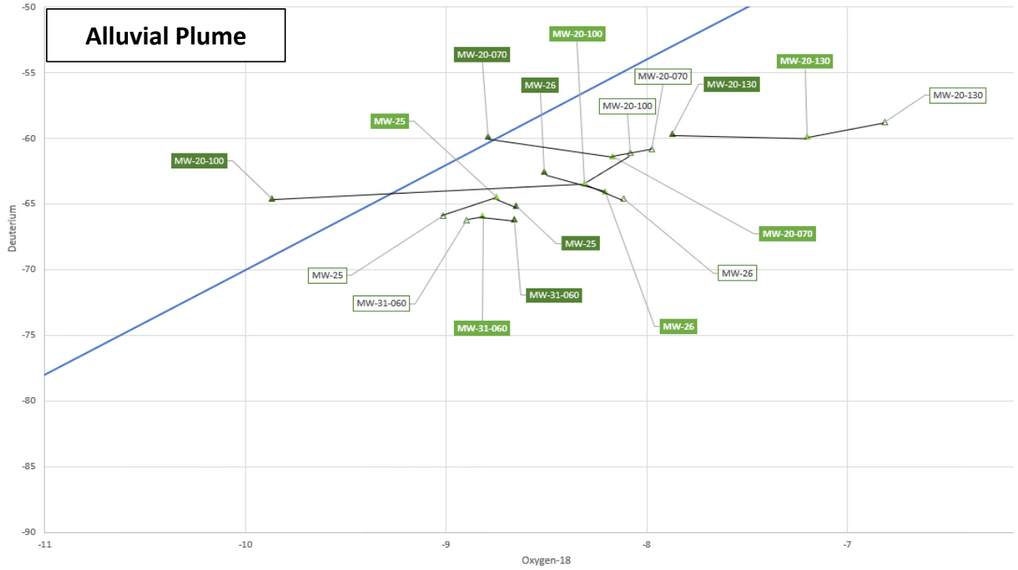
Notes:

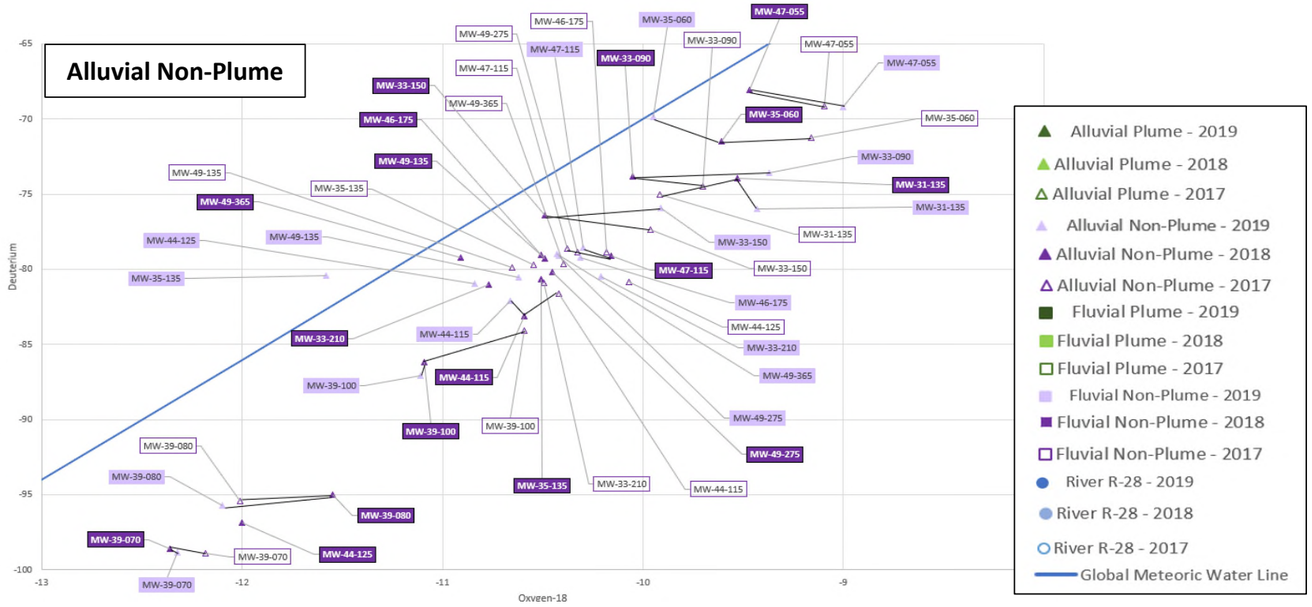
1. For IM pumping, the target landward gradient for well pairs is 0.001 feet/foot.
2. Refer to Table 4-1 and Section 4.4 for discussion of pumping data.
3. Pumping rate plotted is the combined rate of extraction wells TW-03D and PE-01 in operation each month.
4. Beginning August 2017, MW-20-130 approved for gradient compliance (instead of MW-45-095) at central and southern well pairs during months when PE-01 is not run for gradient control.
5. AMSL = above mean sea level.
6. gpm = gallons per minute

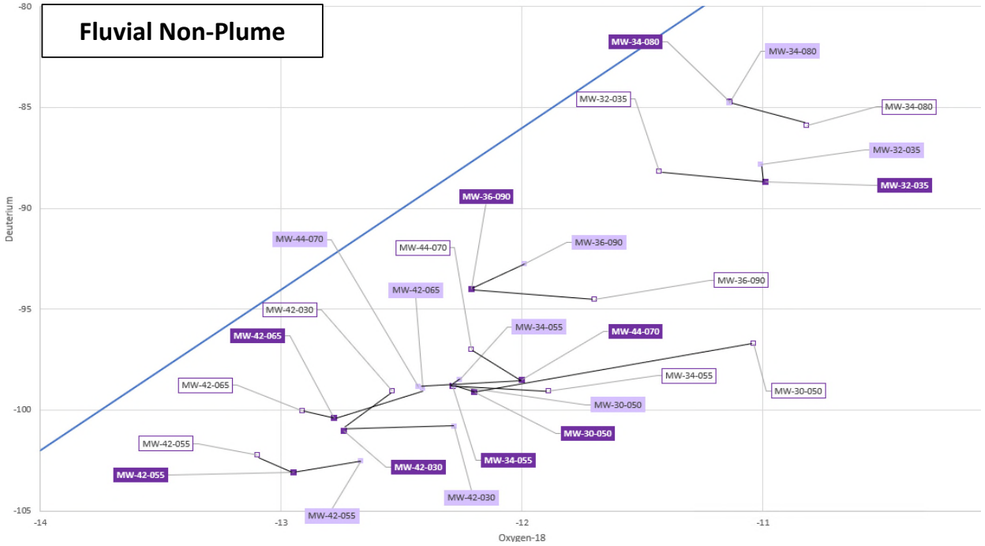
FIGURE 5-5
MEASURED HYDRAULIC GRADIENTS, RIVER ELEVATION, AND PUMPING RATE, 2019 ANNUAL REPORTING PERIOD

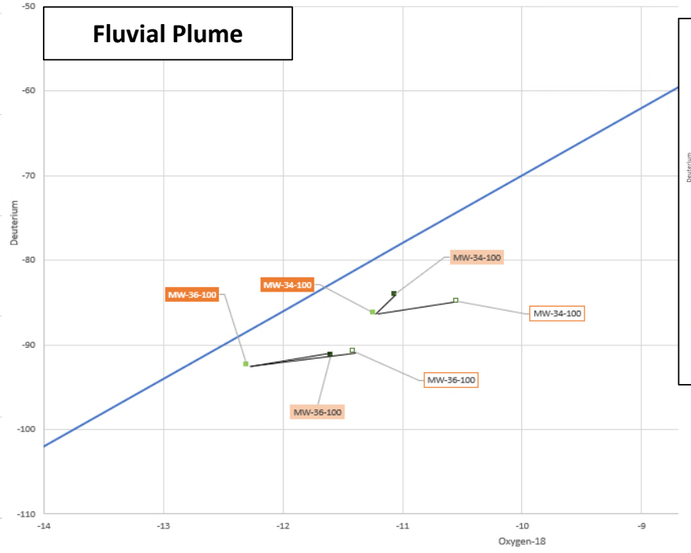
FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

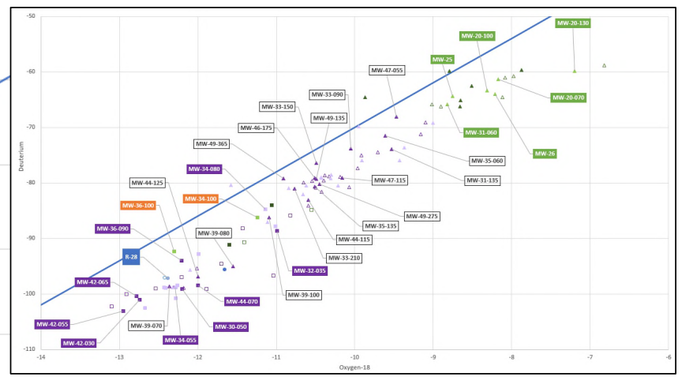
ARCADIS











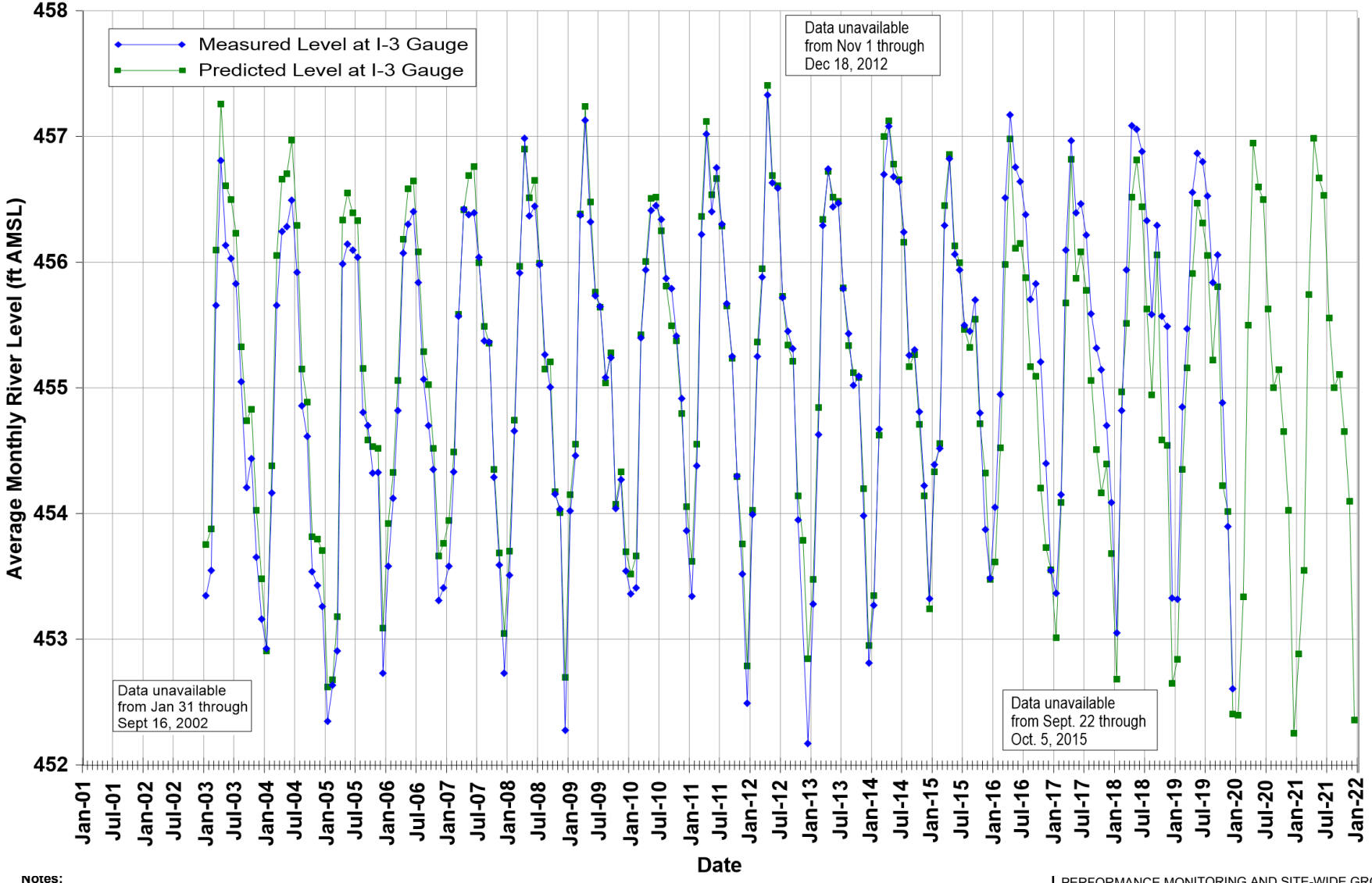
Note:
1. Oxygen-18 and deuterium are presented in parts per thousand.

FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

STABLE ISOTOPES OF OXYGEN AND DEUTERIUM, FOURTH QUARTER 2019

ARCADIS Design & Consultancy for natural and built assets

FIGURE
5-6



Notes:

Projected river level for each month in the past is calculated based on the preceding months United States Bureau of Reclamation (USBR) projections of Davis Dam release and stage in Lake Havasu. Future projections of river level at 1-3 are based upon USBR projections presented in the January 24-Month Study (Report dated January 12, 2020). These data are reported monthly by the US Department of Interior, at https://www.usbr.gov/uc/water/crsp/studies/24Month_01.pdf

ft AMSL = feet above mean sea level

ASURES

PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT

PG&E TOPOCK COMPRESSOR STATION NEEDLES, CALIFORNIA

PAST AND PREDICTED FUTURE RIVER LEVELS AT TOPOCK COMPRESSOR STATION

ARCADIS Design & Consultancy for natural and built assets

FIGURE **5-7**

Z:\GISPROJECTS_ENV\PGE_TOPOCK\GEC\MXD\GMP\4Q19\FINAL\FIGURE5-7_PREDICTED_RIVER_LEVELS_2019Q4.MXD 3/3/2020 1:27:25 PM

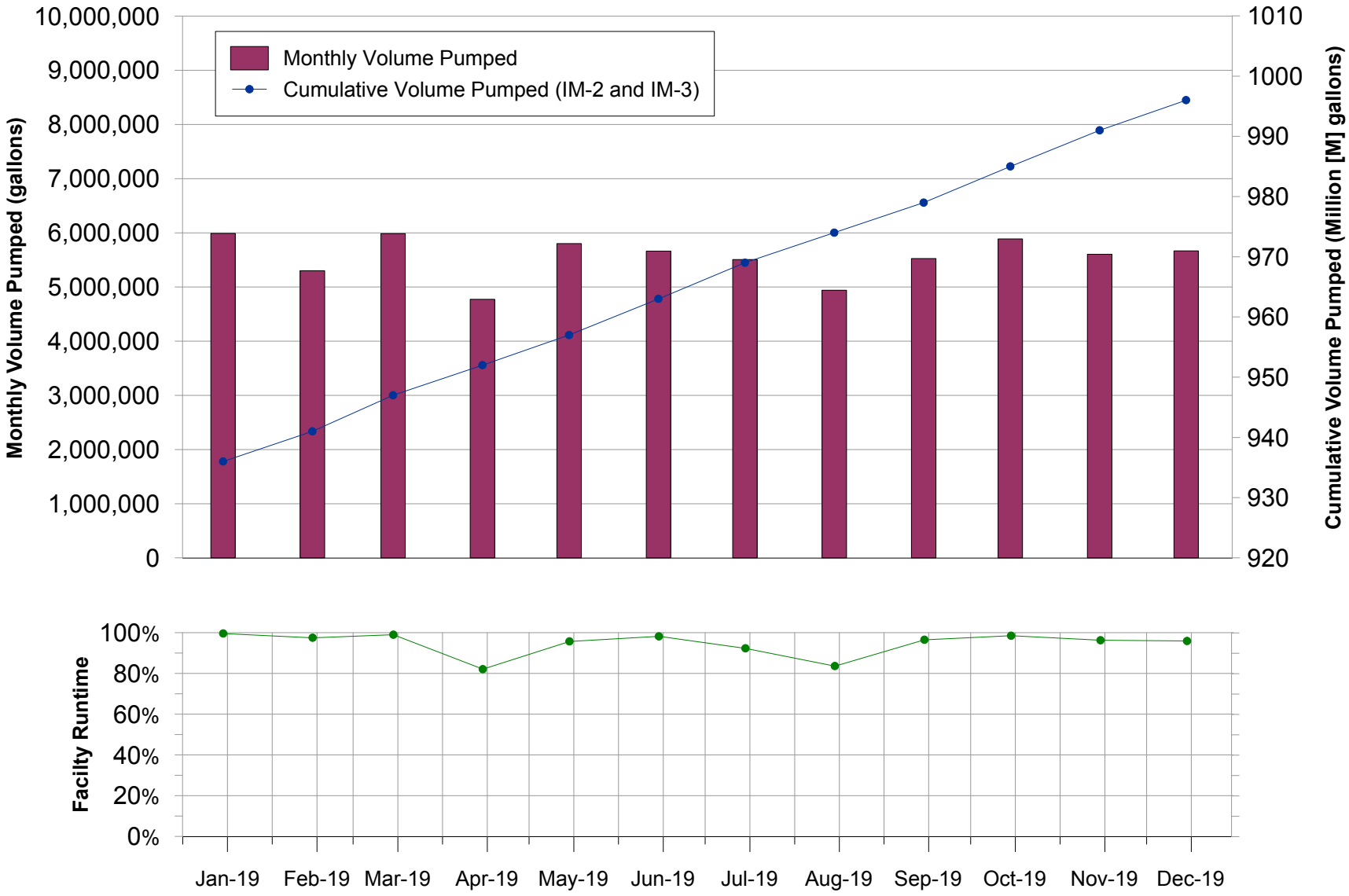


FIGURE 5-8
MONTHLY COMBINED PUMPING VOLUMES AND PERCENT UPTIME, 2019 REPORTING PERIOD
FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

APPENDIX A

Lab Reports, Fourth Quarter 2019 (Provided on CD with Hard Copy Submittal)

For additional help with the information provided in the lab reports, please contact Alison Schaffer, Arcadis Report Lead, at 303.471.3575.

APPENDIX B

Well Inspection and Maintenance Log, Fourth Quarter 2019

Appendix B
Well Inspection and Maintenance Log, Fourth Quarter 2019
Fourth Quarter 2019 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 (Yes/No)?	Action Completed?
MW-09	12/18/2019	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-10	12/18/2019	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-11	12/18/2019	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-12	12/17/2019	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-13	12/19/2019	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-14	12/09/2019	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-15	12/12/2019	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-16	12/09/2019	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-17	12/09/2019	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-18	12/09/2019	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-19	12/12/2019	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-20-070	12/13/2019	Yes	No	--	No	Yes	--	Yes	No	--	Yes	Yes	Yes	Yes	--
MW-20-100	12/13/2019	Yes	No	--	No	Yes	--	Yes	No	--	Yes	No	Yes	Yes	--
MW-20-130	12/13/2019	Yes	No	--	No	Yes	--	Yes	No	--	Yes	No	Yes	Yes	--
MW-21	12/12/2019	Yes	No	--	No	Yes	--	--	No	--	Yes	No	Yes	Yes	--
MW-22	12/11/2019	Yes	No	Yes	No	Yes	--	Yes	No	--	Yes	No	Yes	Yes	--
MW-23-060	12/09/2019	Yes	No	--	No	Yes	--	Yes	No	--	Yes	No	Yes	Yes	--
MW-23-080	12/09/2019	Yes	No	--	No	Yes	--	Yes	No	--	Yes	No	Yes	Yes	--
MW-24A	12/03/2019	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-24B	12/03/2019	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-24BR	12/03/2019	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	No	No	Yes	Yes	--
MW-25	12/09/2019	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-26	12/12/2019	Yes	No	--	No	No	--	Yes	No	--	Yes	No	Yes	Yes	--
MW-27-020	12/10/2019	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-27-060	12/10/2019	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-27-085	12/10/2019	Yes	No	Yes	No	--	--	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-28-025	12/09/2019	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-28-090	12/09/2019	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-29	12/10/2019	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-30-030	12/05/2019	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-30-050	12/05/2019	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-31-060	12/12/2019	Yes	No	Yes	No	Yes	--	Yes	No	--	Yes	No	Yes	Yes	--
MW-31-135	12/12/2019	Yes	No	Yes	No	Yes	--	Yes	No	--	Yes	No	Yes	Yes	--
MW-32-020	12/09/2019	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-32-035	12/09/2019	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-33-040	12/05/2019	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-33-090	12/05/2019	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-33-150	12/05/2019	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-33-210	12/05/2019	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-34-055	12/10/2019	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-34-080	12/10/2019	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-34-100	12/10/2019	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-35-060	12/13/2019	Yes	No	No	No	Yes	--	Yes	No	--	Yes	No	Yes	Yes	--
MW-35-135	12/13/2019	Yes	No	No	No	Yes	--	Yes	No	--	Yes	No	Yes	Yes	--
MW-36-020	12/04/2019	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-36-040	12/04/2019	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-36-050	12/04/2019	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-36-070	12/04/2019	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-36-090	12/04/2019	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-36-100	12/04/2019	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	--	Yes	Yes	--
MW-37D	12/19/2019	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-37S	12/19/2019	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-38D	12/18/2019	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-38S	12/18/2019	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-39-040	12/05/2019	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-39-050	12/05/2019	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	--	No	Yes	Yes	--
MW-39-060	12/05/2019	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-39-070	12/05/2019	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	--	No	Yes	Yes	--
MW-39-080	12/05/2019	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-39-100	12/05/2019	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-40D	12/11/2019	Yes	No	No	No	Yes	--	Yes	No	--	Yes	No	Yes	Yes	--
MW-40S	12/11/2019	Yes	No	No	No	Yes	--	Yes	No	--	Yes	No	Yes	Yes	--
MW-41D	12/17/2019	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-41M	12/17/2019	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-41S	12/17/2019	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-42-030	12/11/2019	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-42-055	12/11/2019	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-42-065	12/11/2019	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-43-025	12/12/2019	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-43-075	12/12/2019	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-43-090	12/12/2019	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-44-070	12/11/2019	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-44-115	12/11/2019	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-44-125	12/11/2019	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-46-175	12/04/2019	Yes	No	Yes		Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-46-205	12/04/2019	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-47-055	12/04/2019	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-47-115	12/04/2019	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-48	12/17/2019	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-49-135	12/10/2019	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-49-275	12/05/2019	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-49-365	12/05/2019	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-50-095	12/12/2019	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-50-200	12/12/2019	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-51	12/12/2019	Yes	No	--	No	Yes	--	Yes	No	--	Yes	No	Yes	Yes	--
MW-52D	12/12/2019	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--

Appendix B
Well Inspection and Maintenance Log, Fourth Quarter 2019
Fourth Quarter 2019 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 (Yes/No)?	Action Completed?
MW-52M	12/12/2019	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-52S	12/12/2019	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-53D	12/12/2019	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-53M	12/12/2019	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-54-085	12/10/2019	Yes	No	No	No	Yes	--	Yes	No	--	Yes	No	Yes	Yes	--
MW-54-140	12/10/2019	Yes	No	No	No	Yes	--	Yes	No	--	Yes	No	Yes	Yes	--
MW-54-195	12/10/2019	Yes	No	--	No	Yes	--	Yes	No	--	Yes	No	Yes	Yes	--
MW-55-045	12/10/2019	Yes	No	Yes	No	Yes	--	Yes	No	--	Yes	No	Yes	Yes	--
MW-55-120	12/10/2019	Yes	No	Yes	No	Yes	--	Yes	No	--	Yes	No	Yes	Yes	--
MW-56D	12/10/2019	No	No	Yes	No	Yes	Yes	Yes	No	Yes	No	No	Yes	Yes	--
MW-56M	12/10/2019	No	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-56S	12/10/2019	No	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-57-070	12/06/2019	Yes	No	No	No	Yes	--	Yes	No	--	Yes	No	Yes	Yes	--
MW-57-185	12/06/2019	Yes	No	No	No	Yes	--	Yes	No	--	Yes	No	Yes	Yes	--
MW-58-065	12/13/2019	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-58BR	12/13/2019	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-59-100	12/13/2019	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
MW-60-125	12/06/2019	Yes	No	No	No	Yes	--	Yes	No	--	Yes	No	Yes	Yes	--
MW-60BR-245	12/12/2019	Yes	No	Yes	No	Yes	--	Yes	No	--	Yes	No	Yes	Yes	--
MW-61-110	12/06/2019	Yes	No	No	No	Yes	--	Yes	No	--	Yes	No	Yes	Yes	--
MW-62-065	12/03/2019	Yes	No	Yes	No	Yes	--	Yes	No	--	Yes	No	Yes	Yes	--
MW-62-110	12/03/2019	--	No	No	No	Yes	--	Yes	No	--	--	No	Yes	Yes	--
MW-62-190	12/03/2019	--	No	No	No	Yes	--	Yes	No	--	--	No	Yes	Yes	--
MW-63-065	12/06/2019	Yes	No	No	No	Yes	--	Yes	No	--	Yes	No	Yes	Yes	--
MW-64BR	12/06/2019	Yes	No	No	No	Yes	--	Yes	No	--	Yes	No	Yes	Yes	--
MW-65-160	12/03/2019	Yes	No	No	No	Yes	--	Yes	No	--	Yes	No	Yes	Yes	--
MW-65-225	12/03/2019	Yes	No	No	No	Yes	--	Yes	No	--	Yes	No	Yes	Yes	--
MW-66-165	12/03/2019	Yes	No	No	No	Yes	--	Yes	No	--	Yes	No	Yes	Yes	--
MW-66-230	12/03/2019	Yes	No	No	No	Yes	--	Yes	No	--	Yes	No	Yes	Yes	--
MW-66BR-270	12/03/2019	--	No	No	No	No	--	Yes	No	--	Yes	No	Yes	Yes	--
MW-67-185	12/04/2019	Yes	No	No	No	Yes	--	Yes	No	--	Yes	No	Yes	Yes	--
MW-67-225	12/04/2019	Yes	No	No	No	Yes	--	Yes	No	--	Yes	No	Yes	Yes	--
MW-67-260	12/04/2019	Yes	No	No	No	Yes	--	Yes	No	--	Yes	No	Yes	Yes	--
MW-68-180	12/04/2019	Yes	No	No	No	Yes	--	Yes	No	--	Yes	No	Yes	Yes	--
MW-68-240	12/04/2019	Yes	No	No	No	Yes	--	Yes	No	--	Yes	No	Yes	Yes	--
MW-68BR-280	12/04/2019	Yes	No	Yes	No	Yes	--	Yes	No	--	Yes	No	Yes	Yes	--
MW-69-195	12/03/2019	Yes	No	No	No	Yes	--	Yes	No	--	Yes	No	Yes	Yes	--
MW-70-105	12/17/2019	Yes	No	No	No	No	--	--	--	--	Yes	--	Yes	Yes	--
MW-70BR-225	12/17/2019	Yes	No	No	No	No	--	--	--	--	Yes	--	Yes	Yes	--
MW-71-035	12/17/2019	Yes	No	No	No	Yes	--	Yes	No	--	Yes	No	Yes	Yes	--
MW-72-080	12/06/2019	No	Yes	No	No	Yes	--	Yes	No	--	Yes	Yes	Yes	Yes	--
MW-72BR-200	12/06/2019	Yes	No	No	No	No	--	Yes	No	--	Yes	No	Yes	Yes	--
MW-73-080	12/06/2019	Yes	No	No	Yes	No	--	Yes	No	--	Yes	Yes	Yes	Yes	--
MW-74-240	12/03/2019	Yes	No	No	No	Yes	--	Yes	No	--	Yes	No	Yes	Yes	--
OW-03D	12/19/2019	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
OW-03M	12/19/2019	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
OW-03S	12/19/2019	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
PGE-07BR	12/03/2019	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	--
PGE-08	12/10/2019	Yes	No	Yes	No	Yes	Yes	Yes	No	--	Yes	No	Yes	Yes	--
PM-03	12/16/2019	--	No	Yes	No	Yes	Yes	Yes	No	--	--	--	Yes	Yes	--
PM-04	12/16/2019	--	No	Yes	No	No	Yes	Yes	No	--	--	--	Yes	Yes	--
TW-01	12/03/2019	No	No	No	No	Yes	No	No	No	Yes	No	No	Yes	Yes	--
TW-04	12/12/2019	Yes	No	Yes	No	Yes	--	Yes	No	Yes	Yes	No	Yes	Yes	--
TW-05	12/12/2019	Yes	No	Yes	No	Yes	--	--	No	Yes	Yes	No	Yes	Yes	--

Note:
-- = not applicable

APPENDIX C

Field Forms, 2019 Annual Reporting Period (Provided on CD with Hard Copy Submittal)

APPENDIX D

Field Water Quality Parameters

Appendix D

Field Water Quality Parameters, 2019 Annual Reporting Period

Fourth Quarter 2019 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	Matrix	Temperature (°C)	pH (SU)	Specific Conductance (µS/cm)	ORP (mV)	Turbidity (NTU)	Total Dissolved Solids (mg/L)	Salinity (PPT)
C-BNS	--	02/12/19	SW	11.4	7.7	1,110	34	2.0	720	0.55
C-BNS	--	03/19/19	SW	15.1	7.8	1,010	110	1.0	650	0.50
C-BNS	--	06/18/19	SW	20.7	8.1	942	99	1.0	610	0.46
C-BNS	--	08/21/19	SW	22.1	8.2	951	66	2.0	610	0.47
C-BNS	--	11/20/19	SW	16.9	8.2	933	110	2.0	600	0.46
C-CON-D	--	02/13/19	SW	9.70	7.8	969	120	2.0	630	0.48
C-CON-D	--	03/20/19	SW	13.5	8.0	991	110	1.0	640	0.49
C-CON-D	--	06/19/19	SW	20.5	8.1	940	99	1.0	610	0.46
C-CON-D	--	08/22/19	SW	22.0	8.1	948	62	2.0	610	0.47
C-CON-D	--	11/21/19	SW	16.1	8.1	949	110	13	610	0.47
C-CON-S	--	02/13/19	SW	9.70	7.7	963	110	2.0	620	0.48
C-CON-S	--	03/20/19	SW	13.7	8.2	1,000	100	1.0	650	0.50
C-CON-S	--	06/19/19	SW	20.6	8.1	943	98	1.0	610	0.46
C-CON-S	--	08/22/19	SW	22.2	8.2	946	66	2.0	610	0.47
C-CON-S	--	11/21/19	SW	16.1	8.2	944	120	9.0	610	0.47
C-I-3-D	--	02/12/19	SW	10.9	7.8	1,110	36	2.0	720	0.55
C-I-3-D	--	03/19/19	SW	13.8	8.2	1,000	110	1.0	650	0.50
C-I-3-D	--	06/18/19	SW	20.6	8.0	940	93	1.0	610	0.46
C-I-3-D	--	08/21/19	SW	21.4	8.1	951	68	3.0	610	0.47
C-I-3-D	--	11/20/19	SW	16.7	8.2	931	110	3.0	600	0.46
C-I-3-S	--	02/12/19	SW	10.8	7.8	1,110	28	2.0	710	0.55
C-I-3-S	--	03/19/19	SW	13.7	8.1	992	110	1.0	650	0.49
C-I-3-S	--	06/18/19	SW	20.5	8.0	938	94	1.0	610	0.46
C-I-3-S	--	08/21/19	SW	21.4	8.1	952	66	2.0	610	0.47
C-I-3-S	--	11/20/19	SW	16.7	8.2	931	110	2.0	600	0.46
C-MAR-D	--	02/13/19	SW	9.80	7.1	1	140	25	730	0.49
C-MAR-D	--	03/20/19	SW	14.0	8.3	991	110	3.0	640	0.49
C-MAR-D	--	06/19/19	SW	21.4	8.1	966	92	8.0	610	0.47
C-MAR-D	--	08/22/19	SW	22.0	8.2	947	50	8.0	610	0.47
C-MAR-D	--	11/21/19	SW	15.8	7.9	1,160	120	31	750	0.58
C-MAR-S	--	02/13/19	SW	9.90	7.8	973	140	20	630	0.48
C-MAR-S	--	03/20/19	SW	14.0	8.4	993	110	13	650	0.49
C-MAR-S	--	06/19/19	SW	21.4	8.1	942	95	4.0	610	0.46
C-MAR-S	--	08/22/19	SW	22.1	8.2	956	52	5.0	610	0.47
C-MAR-S	--	11/21/19	SW	15.8	7.9	1,120	120	29	730	0.56
C-NR1-D	--	02/13/19	SW	8.90	7.9	982	110	2.0	630	0.48
C-NR1-D	--	03/20/19	SW	13.5	8.1	991	100	1.0	640	0.49
C-NR1-D	--	06/19/19	SW	20.6	8.1	940	95	1.0	610	0.46
C-NR1-D	--	08/22/19	SW	22.2	8.1	948	65	2.0	610	0.47
C-NR1-D	--	11/21/19	SW	16.1	8.2	944	120	15	610	0.47
C-NR1-S	--	02/13/19	SW	10.0	7.9	961	100	2.0	630	0.48
C-NR1-S	--	06/19/19	SW	20.6	8.1	941	97	1.0	610	0.46
C-NR1-S	--	08/22/19	SW	22.1	8.2	946	66	2.0	610	0.47
C-NR1-S	--	11/21/19	SW	16.1	8.2	944	120	14	610	0.47
C-NR3-D	--	02/13/19	SW	10.0	7.9	961	100	2.0	630	0.48
C-NR3-D	--	03/20/19	SW	13.4	8.0	984	110	1.0	640	0.49
C-NR3-D	--	06/19/19	SW	20.8	8.1	941	93	1.0	610	0.46
C-NR3-D	--	08/22/19	SW	22.1	8.0	961	79	2.0	620	0.47
C-NR3-D	--	11/21/19	SW	16.1	8.2	945	120	13	610	0.47
C-NR3-S	--	02/13/19	SW	9.90	7.9	964	98	2.0	620	0.46
C-NR3-S	--	03/20/19	SW	13.4	8.0	987	100	1.0	640	0.50
C-NR3-S	--	06/19/19	SW	20.7	8.1	941	96	1.0	610	0.46
C-NR3-S	--	08/22/19	SW	22.5	8.1	947	67	2.0	610	0.47
C-NR3-S	--	11/21/19	SW	16.3	8.2	945	120	13	610	0.47

Appendix D

Field Water Quality Parameters, 2019 Annual Reporting Period

Fourth Quarter 2019 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	Matrix	Temperature (°C)	pH (SU)	Specific Conductance (µS/cm)	ORP (mV)	Turbidity (NTU)	Total Dissolved Solids (mg/L)	Salinity (PPT)
C-NR4-D	--	02/13/19	SW	10.1	7.9	963	96	2.0	630	0.48
C-NR4-D	--	03/20/19	SW	13.4	8.1	987	100	1.0	640	0.49
C-NR4-D	--	06/19/19	SW	20.9	8.2	941	95	1.0	610	0.46
C-NR4-D	--	08/22/19	SW	22.9	8.4	949	65	2.0	610	0.47
C-NR4-D	--	11/21/19	SW	16.5	8.1	947	120	15	610	0.47
C-NR4-S	--	02/13/19	SW	10.0	7.9	962	94	2.0	630	0.48
C-NR4-S	--	03/20/19	SW	13.2	8.0	985	100	1.0	640	0.49
C-NR4-S	--	06/19/19	SW	21.1	8.2	942	96	1.0	610	0.46
C-NR4-S	--	08/22/19	SW	22.9	8.2	950	61	2.0	610	0.47
C-NR4-S	--	11/21/19	SW	16.3	8.1	946	120	12	610	0.47
C-R22A-D	--	02/12/19	SW	13.6	7.8	1,110	38	2.0	720	0.55
C-R22A-D	--	03/19/19	SW	14.2	7.7	991	110	1.0	640	0.49
C-R22A-D	--	06/18/19	SW	21.2	8.1	938	91	2.0	610	0.46
C-R22A-D	--	08/21/19	SW	21.8	8.1	958	69	2.0	620	0.47
C-R22A-D	--	11/20/19	SW	17.0	8.2	940	110	3.0	610	0.47
C-R22A-S	--	02/12/19	SW	11.8	7.6	1,120	42	2.0	720	0.56
C-R22A-S	--	03/19/19	SW	14.1	7.8	998	110	1.0	650	0.50
C-R22A-S	--	06/18/19	SW	21.2	8.1	940	100	1.0	610	0.46
C-R22A-S	--	08/21/19	SW	22.3	8.2	952	72	2.0	610	0.47
C-R22A-S	--	11/20/19	SW	16.9	8.2	943	110	3.0	610	0.47
C-R27-D	--	02/12/19	SW	11.8	7.7	1,110	37	2.0	720	0.55
C-R27-D	--	06/18/19	SW	20.8	8.1	940	110	1.0	610	0.46
C-R27-D	--	08/21/19	SW	22.7	8.1	952	65	3.0	610	0.47
C-R27-D	--	11/20/19	SW	17.1	8.2	934	110	3.0	600	0.46
C-R27-S	--	02/12/19	SW	11.8	7.7	1,120	42	2.0	720	0.56
C-R27-S	--	03/19/19	SW	13.8	7.7	995	110	1.0	650	0.50
C-R27-S	--	06/18/19	SW	21.0	8.1	590	96	1.0	360	0.27
C-R27-S	--	08/21/19	SW	23.1	8.2	955	66	3.0	620	0.47
C-R27-S	--	11/20/19	SW	17.1	8.2	935	110	2.0	600	0.46
C-TAZ-D	--	02/12/19	SW	11.0	7.7	1,150	31	2.0	740	0.57
C-TAZ-D	--	03/19/19	SW	13.7	8.3	993	100	1.0	650	0.49
C-TAZ-D	--	06/18/19	SW	21.1	7.9	938	95	1.0	610	0.46
C-TAZ-D	--	08/21/19	SW	21.5	8.1	952	62	3.0	610	0.47
C-TAZ-D	--	11/20/19	SW	16.8	8.2	931	100	3.0	600	0.46
C-TAZ-S	--	02/12/19	SW	11.2	7.8	1,110	32	2.0	720	0.55
C-TAZ-S	--	03/19/19	SW	13.8	8.2	993	110	1.0	650	0.49
C-TAZ-S	--	06/18/19	SW	21.0	8.0	940	95	1.0	610	0.46
C-TAZ-S	--	08/21/19	SW	21.4	8.1	954	66	2.0	610	0.47
C-TAZ-S	--	11/20/19	SW	16.7	8.2	933	110	2.0	600	0.46
MW-09	SA	03/18/19	GW	31.1	7.1	3,250	92	3.0	2,110	1.68
MW-09	SA	05/17/19	GW	29.4	7.4	2,700	200	1.0	1,760	1.39
MW-09	SA	09/30/19	GW	29.8	7.3	3,340	230	1.0	2,170	1.73
MW-09	SA	12/18/19	GW	30.2	7.7	3,200	71	7.0	2,090	1.67
MW-10	SA	03/18/19	GW	30.2	7.3	3,070	94	7.0	2,010	1.60
MW-10	SA	05/17/19	GW	28.9	7.3	2,650	240	47	1,700	1.35
MW-10	SA	09/30/19	GW	31.5	7.4	2,990	170	9.0	1,950	1.55
MW-10	SA	12/18/19	GW	30.2	7.7	2,490	83	5.0	1,600	1.26
MW-11	SA	03/18/19	GW	30.8	7.4	2,410	100	7.0	1,570	1.23
MW-11	SA	05/17/19	GW	30.0	7.4	2,130	190	1.0	1,380	1.08
MW-11	SA	09/30/19	GW	31.9	7.5	2,590	160	5.0	1,680	1.32
MW-11	SA	12/18/19	GW	30.7	7.8	2,490	98	8.0	1,610	1.27
MW-12	SA	05/22/19	GW	29.8	8.1	7,560	30	3.0	4,920	4.13
MW-12	SA	12/17/19	GW	27.7	8.2	6,810	52	5.0	4,430	3.72
MW-13	SA	12/19/19	GW	29.0	7.7	2,600	73	9.0	1,690	1.33

Appendix D

Field Water Quality Parameters, 2019 Annual Reporting Period

Fourth Quarter 2019 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	Matrix	Temperature (°C)	pH (SU)	Specific Conductance (µS/cm)	ORP (mV)	Turbidity (NTU)	Total Dissolved Solids (mg/L)	Salinity (PPT)
MW-14	SA	05/15/19	GW	31.6	7.0	3,170	-66	3.0	2,050	1.63
MW-14	SA	12/09/19	GW	31.1	7.5	3,190	72	38	2,070	1.65
MW-15	SA	12/12/19	GW	27.1	7.8	2,300	92	3.0	1,480	1.17
MW-16	SA	12/09/19	GW	31.3	7.9	1,150	77	8.0	750	0.57
MW-17	SA	12/09/19	GW	31.1	7.8	1,320	75	3.0	850	0.65
MW-18	SA	12/09/19	GW	30.5	7.6	1,620	74	3.0	1,050	0.81
MW-19	SA	05/15/19	GW	29.7	6.8	2,220	-23	2.0	1,440	1.13
MW-19	SA	12/12/19	GW	28.6	7.9	2,450	240	2.0	1,520	0.87
MW-20-070	SA	05/24/19	GW	30.9	7.7	1,980	69	4.0	1,350	1.01
MW-20-070	SA	12/13/19	GW	29.1	7.6	2,190	-34	5.0	1,440	1.07
MW-20-100	MA	05/24/19	GW	30.3	7.1	2,430	61	2.0	1,570	1.24
MW-20-100	MA	12/13/19	GW	29.3	7.4	2,830	-40	3.0	1,820	1.40
MW-20-130	DA	05/24/19	GW	30.1	7.5	11,500	17	7.0	7,500	6.53
MW-20-130	DA	12/13/19	GW	28.3	7.1	11,400	-120	3.0	7,330	7.06
MW-21	SA	05/23/19	GW	26.2	7.3	12	83	22	15,960	14.41
MW-21	SA	12/13/19	GW	28.4	7.3	11,700	67	44	7,460	7.12
MW-22	SA	04/23/19	GW	21.9	7.0	15,600	-100	1.0	10,120	9.19
MW-22	SA	12/11/19	GW	23.9	6.6	21,000	-110	213	15,190	14.07
MW-23-060	BR	05/21/19	GW	31.6	9.4	17,900	10	2.0	11,610	10.55
MW-23-060	BR	12/09/19	GW	28.9	9.1	17,700	79	3.0	11,310	10.86
MW-23-080	BR	05/21/19	GW	31.1	9.7	18,100	-120	8.0	11,930	10.79
MW-23-080	BR	12/09/19	GW	29.3	9.6	18,300	45	3.0	11,520	11.02
MW-24A	SA	05/17/19	GW	31.3	7.9	1,650	-88	5.0	1,070	0.82
MW-24A	SA	12/03/19	GW	31.2	8.5	4,000	-290	5.0	2,620	2.11
MW-24B	DA	05/17/19	GW	31.0	7.4	20,500	-97	5.0	13,320	12.15
MW-24B	DA	12/03/19	GW	31.9	7.9	19,600	-210	7.0	12,770	11.62
MW-24BR	BR	12/04/19	GW	32.1	7.9	14,800	-240	1.0	9,630	8.52
MW-25	SA	05/15/19	GW	31.2	6.7	2,160	-64	2.0	1,400	1.09
MW-25	SA	12/09/19	GW	31.2	7.5	2,110	76	8.0	1,370	1.07
MW-26	SA	05/22/19	GW	29.7	7.3	2,990	77	17	1,910	1.51
MW-26	SA	12/12/19	GW	29.5	7.4	4,070	160	3.0	2,600	2.06
MW-27-020	SA	12/10/19	GW	19.6	7.6	1,170	-37	9.0	750	0.58
MW-27-060	MA	12/10/19	GW	19.0	7.6	1,030	-110	8.0	660	0.51
MW-27-085	DA	04/22/19	GW	20.3	7.3	3,950	120	1.0	2,560	2.11
MW-27-085	DA	12/10/19	GW	19.0	7.4	10,100	-25	2.0	6,560	5.72
MW-28-025	SA	05/21/19	GW	21.9	7.5	1,040	81	2.0	1,220	0.96
MW-28-025	SA	12/09/19	GW	23.0	7.0	1,230	13	3.0	790	0.61
MW-28-090	DA	05/21/19	GW	21.0	7.1	3,130	-25	16	2,020	1.63
MW-28-090	DA	12/09/19	GW	19.5	7.1	7,760	-65	2.0	5,030	4.31
MW-29	SA	05/21/19	GW	25.2	7.4	3,360	-160	2.0	4,330	3.67
MW-29	SA	12/10/19	GW	23.8	7.3	1,920	-110	8.0	1,240	0.97
MW-30-030	SA	12/05/19	GW	25.0	7.7	7,180	-32	2.0	4,650	3.93
MW-30-050	MA	12/05/19	GW	21.6	7.6	1,050	22	1.0	680	0.52
MW-31-060	SA	05/20/19	GW	28.9	7.5	4,020	68	16	4,880	4.12
MW-31-060	SA	12/12/19	GW	28.2	7.7	3,420	-9.9	2.0	2,210	1.78
MW-31-135	DA	12/12/19	GW	28.4	7.8	12,700	-130	8.0	8,240	7.23
MW-32-020	SA	12/09/19	GW	24.8	6.8	23,500	-130	8.0	15,240	14.18
MW-32-035	SA	04/23/19	GW	25.2	7.0	13,700	-50	15	8,930	7.93
MW-32-035	SA	12/09/19	GW	25.0	7.0	9,950	-130	19	6,460	5.59
MW-33-040	SA	04/23/19	GW	27.5	7.8	10,600	61	1.0	6,870	5.96
MW-33-040	SA	12/05/19	GW	27.2	7.2	14,200	82	1.0	9,860	8.80
MW-33-090	MA	04/22/19	GW	26.1	7.0	10,500	58	27	6,600	5.72
MW-33-090	MA	12/05/19	GW	25.5	7.3	9,320	73	6.0	6,020	5.18

Appendix D

Field Water Quality Parameters, 2019 Annual Reporting Period

Fourth Quarter 2019 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	Matrix	Temperature (°C)	pH (SU)	Specific Conductance (µS/cm)	ORP (mV)	Turbidity (NTU)	Total Dissolved Solids (mg/L)	Salinity (PPT)
MW-33-150	DA	05/21/19	GW	27.3	7.5	16	84	20	18,760	17.75
MW-33-150	DA	12/05/19	GW	24.2	7.4	14,700	110	8.0	9,520	8.52
MW-33-210	DA	04/22/19	GW	27.7	7.5	9,320	130	1.0	6,030	5.21
MW-33-210	DA	12/05/19	GW	25.0	7.5	19,800	110	5.0	12,890	11.82
MW-34-055	MA	12/10/19	GW	18.9	7.6	995	-85	4.0	640	0.49
MW-34-080	DA	04/24/19	GW	19.9	7.1	8,960	51	1.0	5,810	5.01
MW-34-080	DA	12/10/19	GW	19.4	7.3	8,560	-41	3.0	5,570	4.79
MW-34-100	DA	02/14/19	GW	18.9	7.6	7,810	-86	2.0	5,510	4.71
MW-34-100	DA	04/24/19	GW	18.1	7.6	9,140	-2.2	1.0	6,090	5.23
MW-34-100	DA	10/01/19	GW	20.0	7.3	1,890	100	7.0	3,580	2.99
MW-34-100	DA	12/10/19	GW	19.3	7.6	13,900	-67	2.0	8,930	7.96
MW-35-060	SA	05/24/19	GW	27.9	7.5	5,840	83	24	7,340	6.39
MW-35-060	SA	12/13/19	GW	27.3	7.5	6,430	51	14	4,190	3.48
MW-35-135	DA	05/24/19	GW	27.1	7.7	12	95	8.0	14,300	13.20
MW-35-135	DA	12/13/19	GW	27.0	7.7	11,500	35	27	7,470	6.50
MW-36-020	SA	12/04/19	GW	22.0	7.4	6,140	-210	6.0	3,990	3.35
MW-36-040	SA	12/04/19	GW	20.8	7.9	1,070	-260	3.0	690	0.53
MW-36-050	MA	12/04/19	GW	20.3	7.5	1,010	-230	3.0	660	0.50
MW-36-070	MA	12/04/19	GW	20.4	7.8	1,040	-240	3.0	670	0.52
MW-36-090	DA	04/24/19	GW	20.6	7.2	5,060	20	1.0	3,280	2.73
MW-36-090	DA	12/04/19	GW	20.1	7.3	5,400	-210	3.0	3,490	2.91
MW-36-100	DA	04/24/19	GW	18.9	7.5	7,460	-60	1.0	4,820	4.15
MW-36-100	DA	12/04/19	GW	20.2	7.5	1,020	-230	3.0	650	0.50
MW-37D	DA	05/20/19	GW	28.5	7.7	14	86	3.0	17,070	16.01
MW-37D	DA	12/19/19	GW	28.3	7.8	13,800	44	3.0	8,950	7.92
MW-37S	MA	12/19/19	GW	28.9	7.7	7,460	42	7.0	4,840	4.09
MW-38D	DA	05/17/19	GW	30.2	7.8	22,800	-94	9.0	14,740	13.61
MW-38D	DA	12/18/19	GW	30.5	8.4	22,900	31	15	14,910	13.75
MW-38S	SA	02/13/19	GW	31.3	7.5	1,530	-66	3.0	1,090	0.75
MW-38S	SA	05/17/19	GW	30.8	7.4	142	-68	5.0	1,130	0.87
MW-38S	SA	09/25/19	GW	30.9	8.0	1,790	-1.9	5.0	1,150	0.89
MW-38S	SA	12/18/19	GW	30.4	8.0	1,660	71	5.0	1,070	0.83
MW-38S-SMT	SA	02/13/19	GW	30.6	7.4	1,470	-35	2.0	1,020	0.75
MW-39-040	SA	12/05/19	GW	21.9	7.6	1,160	-180	3.0	740	0.44
MW-39-050	MA	12/05/19	GW	21.6	8.0	1,120	24	3.0	720	0.44
MW-39-060	MA	12/05/19	GW	22.3	8.0	1,430	25	3.0	950	0.45
MW-39-070	MA	12/05/19	GW	21.5	7.9	2,090	8.8	3.0	1,330	1.08
MW-39-080	DA	12/05/19	GW	22.4	8.1	4,910	-210	3.0	1,960	1.59
MW-39-100	DA	04/24/19	GW	24.2	6.8	12,300	54	8.0	7,970	7.06
MW-39-100	DA	12/05/19	GW	22.5	7.3	13,100	30	8.0	8,500	7.53
MW-40D	DA	05/22/19	GW	30.5	7.5	16,700	-62	6.0	10,630	9.83
MW-40D	DA	12/11/19	GW	30.8	7.7	16,800	25	4.0	10,880	9.74
MW-40S	SA	05/22/19	GW	24.0	7.4	2,340	26	15	1,520	1.20
MW-40S	SA	12/11/19	GW	25.8	7.2	2,050	77	9.0	1,330	1.05
MW-41D	DA	05/15/19	GW	29.4	7.1	20,100	-79	2.0	13,070	11.90
MW-41D	DA	12/17/19	GW	27.3	7.8	22,200	21	2.0	14,410	13.30
MW-41M	DA	12/17/19	GW	28.1	7.7	15,300	23	9.0	9,950	8.88
MW-41S	SA	12/17/19	GW	28.3	7.8	7,060	56	15	4,570	3.85
MW-42-030	SA	12/11/19	GW	22.7	8.0	3,040	-130	3.0	1,900	1.60
MW-42-055	MA	04/23/19	GW	21.7	8.3	1,040	-36	1.0	690	0.52
MW-42-055	MA	12/11/19	GW	20.7	8.1	991	-84	2.0	640	0.49
MW-42-065	MA	04/23/19	GW	23.1	7.5	2,890	-10	1.0	1,870	1.48
MW-42-065	MA	12/11/19	GW	20.8	7.3	3,130	60	3.0	1,980	1.60
MW-43-025	SA	12/12/19	GW	21.8	7.3	1,640	-140	231	1,070	0.83

Appendix D

Field Water Quality Parameters, 2019 Annual Reporting Period

Fourth Quarter 2019 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	Matrix	Temperature (°C)	pH (SU)	Specific Conductance (µS/cm)	ORP (mV)	Turbidity (NTU)	Total Dissolved Solids (mg/L)	Salinity (PPT)
MW-43-075	DA	12/12/19	GW	21.0	7.0	12,100	-130	2.0	7,910	6.98
MW-43-090	DA	12/12/19	GW	20.8	6.9	17,200	-34	4.0	11,550	10.52
MW-44-070	MA	04/24/19	GW	22.6	7.2	2,630	-60	4.0	1,720	1.38
MW-44-070	MA	12/11/19	GW	20.2	7.6	1,150	-120	5.0	740	0.57
MW-44-115	DA	02/15/19	GW	19.5	6.9	11,300	-100	2.0	7,710	6.50
MW-44-115	DA	04/24/19	GW	21.4	7.5	11,400	91	3.0	7,410	6.50
MW-44-115	DA	10/01/19	GW	23.3	7.7	11,800	140	4.0	7,620	6.70
MW-44-115	DA	12/11/19	GW	20.4	7.8	11,300	-11	2.0	7,360	6.47
MW-44-125	DA	04/24/19	GW	20.4	7.7	4,140	-88	1.0	2,490	1.80
MW-44-125	DA	12/11/19	GW	20.7	7.5	15,300	-47	2.0	9,990	8.98
MW-46-175	DA	02/15/19	GW	19.8	6.9	18,300	-88	2.0	12,550	10.99
MW-46-175	DA	05/21/19	GW	21.3	7.5	5,010	140	1.0	3,280	2.72
MW-46-175	DA	10/01/19	GW	23.7	7.9	19,300	120	5.0	12,500	11.50
MW-46-175	DA	12/04/19	GW	16.9	8.2	19,400	120	7.0	12,570	11.55
MW-46-205	DA	05/21/19	GW	22.6	8.4	21	110	2.0	23,040	22.31
MW-46-205	DA	12/04/19	GW	17.5	7.9	20,200	140	9.0	13,130	12.11
MW-47-055	SA	05/16/19	GW	29.0	7.4	5,000	120	14	3,250	2.66
MW-47-055	SA	12/04/19	GW	26.5	7.5	4,750	77	7.0	3,090	2.54
MW-47-115	DA	05/16/19	GW	28.5	7.4	9,360	150	28	6,080	5.18
MW-47-115	DA	12/04/19	GW	26.8	7.6	14,800	21	4.0	9,600	8.55
MW-48	BR	05/23/19	GW	28.7	7.9	18,700	77	8.0	12,240	11.05
MW-48	BR	12/19/19	GW	26.5	8.0	18,600	81	16	12,080	11.02
MW-49-135	DA	12/10/19	GW	20.8	7.7	13,800	-160	9.0	8,970	8.00
MW-49-275	DA	12/05/19	GW	25.3	7.1	12,800	120	2.0	20,230	17.20
MW-49-365	DA	12/05/19	GW	22.8	7.2	36,300	150	9.0	23,600	22.96
MW-50-095	MA	05/20/19	GW	29.4	7.8	3,540	210	14	2,310	1.86
MW-50-095	MA	12/12/19	GW	28.5	7.5	6,050	160	3.0	3,870	3.38
MW-50-200	DA	05/20/19	GW	29.4	7.8	22,400	250	1.0	14,520	13.38
MW-50-200	DA	12/12/19	GW	29.4	7.6	20,800	230	1.0	13,040	12.76
MW-51	MA	05/22/19	GW	29.6	7.4	8,710	89	1.0	5,660	4.82
MW-51	MA	12/12/19	GW	30.0	7.1	12,700	200	1.0	7,940	7.23
MW-52D	DA	04/23/19	GW	19.4	7.5	21,700	-160	1.0	14,070	13.00
MW-52D	DA	12/12/19	GW	19.7	7.9	21,700	-140	1.0	14,110	13.08
MW-52M	DA	04/23/19	GW	20.4	7.0	13,000	-17	1.0	8,160	7.50
MW-52M	DA	12/12/19	GW	19.8	7.4	16,400	-130	1.0	10,670	9.65
MW-52S	MA	04/23/19	GW	19.1	7.1	10,800	-110	1.0	7,030	6.18
MW-52S	MA	12/12/19	GW	19.4	6.9	11,200	-86	3.0	6,830	6.98
MW-53D	DA	04/23/19	GW	20.1	8.3	26,400	-130	1.0	17,170	16.22
MW-53D	DA	12/12/19	GW	18.6	8.1	26,200	-94	2.0	17,070	16.08
MW-53M	DA	04/23/19	GW	21.5	7.6	15,900	85	1.0	10,330	9.32
MW-53M	DA	12/12/19	GW	18.8	8.0	19,500	-150	1.0	12,760	11.71
MW-54-085	DA	05/23/19	GW	26.8	7.6	8,800	-82	12	10,750	9.67
MW-54-085	DA	12/10/19	GW	27.1	7.4	10,600	15	5.0	6,910	6.00
MW-54-140	DA	05/23/19	GW	26.8	7.7	8,760	-67	1.0	5,690	4.87
MW-54-140	DA	12/10/19	GW	26.2	7.7	13,200	-6.1	8.0	8,550	7.56
MW-54-195	DA	05/23/19	GW	26.7	8.1	10,700	-160	1.0	6,910	6.02
MW-54-195	DA	08/22/19	GW	27.6	8.3	17,700	37	12	11,540	10.43
MW-54-195	DA	12/10/19	GW	25.5	7.8	19,000	-270	3.0	12,490	11.63
MW-55-045	MA	05/23/19	GW	27.5	7.7	1,410	-78	1.0	920	0.66
MW-55-045	MA	12/10/19	GW	28.2	7.6	1,310	7.0	9.0	850	0.65
MW-55-120	DA	05/23/19	GW	27.3	8.0	8,270	83	12	10,100	9.04
MW-55-120	DA	12/10/19	GW	27.6	7.9	8,430	37	7.0	5,480	4.68
MW-56D	DA	05/23/19	GW	22.3	7.3	11,900	-71	1.0	7,710	6.71
MW-56D	DA	12/10/19	GW	21.1	7.6	22,400	-130	3.0	14,210	13.73

Appendix D

Field Water Quality Parameters, 2019 Annual Reporting Period

Fourth Quarter 2019 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	Matrix	Temperature (°C)	pH (SU)	Specific Conductance (µS/cm)	ORP (mV)	Turbidity (NTU)	Total Dissolved Solids (mg/L)	Salinity (PPT)
MW-56M	DA	05/23/19	GW	23.2	7.0	4,540	-81	1.0	2,930	1.80
MW-56M	DA	12/10/19	GW	22.9	7.4	14,800	-120	3.0	9,180	8.59
MW-56S	SA	05/23/19	GW	22.6	7.0	3,510	-110	1.0	2,250	1.47
MW-56S	SA	12/10/19	GW	22.0	7.4	5,890	-91	3.0	3,750	3.46
MW-57-070	BR	05/20/19	GW	32.4	7.5	2,810	54	8.0	1,850	1.45
MW-57-070	BR	12/06/19	GW	28.4	7.2	2,830	-51	5.0	1,770	1.39
MW-57-185	BR	05/20/19	GW	28.5	8.9	19,100	19	6.0	12,330	10.92
MW-57-185	BR	12/06/19	GW	27.8	9.6	20,100	-200	5.0	12,800	11.10
MW-58BR	BR	02/14/19	GW	18.2	7.7	8,910	28	26	7,110	5.80
MW-58BR	BR	05/21/19	GW	28.5	7.7	8,880	34	43	10,830	9.74
MW-58BR	BR	08/19/19	GW	30.6	7.9	9,350	44	3.0	6,070	5.19
MW-58BR	BR	12/13/19	GW	29.0	7.5	10,200	-170	3.0	8,230	5.68
MW-59-100	SA	05/20/19	GW	30.1	7.0	14	110	15	15,980	16.40
MW-59-100	SA	12/13/19	GW	28.6	7.1	13,200	150	30	8,580	7.56
MW-60-125	BR	05/22/19	GW	28.9	7.4	9,690	47	31	12,030	10.91
MW-60-125	BR	12/06/19	GW	28.7	7.5	8,760	80	22	5,690	4.86
MW-60BR-245	BR	02/14/19	GW	30.5	7.7	16,700	-81	3.0	11,300	9.69
MW-60BR-245	BR	05/22/19	GW	31.7	7.9	19	68	7.0	22,710	21.82
MW-60BR-245	BR	12/12/19	GW	29.3	7.9	18,200	17	1.0	11,840	10.73
MW-60BR-245_D	BR	02/14/19	GW	26.3	7.6	16,500	16	3.0	11,180	9.62
MW-60BR-245_D	BR	05/23/19	GW	27.5	7.9	18,200	3.1	1.0	11,800	10.64
MW-60BR-245_D	BR	12/13/19	GW	28.1	7.9	18,200	30	1.0	11,820	10.75
MW-60BR-245_S	BR	02/14/19	GW	25.5	7.3	16,300	3.5	5.0	11,100	9.55
MW-60BR-245_S	BR	05/23/19	GW	26.7	7.8	18,000	8.1	1.0	11,670	10.53
MW-60BR-245_S	BR	12/13/19	GW	27.9	7.9	18,100	27	1.0	11,750	10.64
MW-61-110	BR	05/23/19	GW	31.3	7.4	17,500	-94	7.0	11,360	10.20
MW-61-110	BR	12/06/19	GW	29.0	6.7	17,700	88	4.0	11,310	10.65
MW-62-065	BR	02/11/19	GW	27.5	7.0	7,410	-52	12	5,050	4.10
MW-62-065	BR	05/21/19	GW	30.7	7.4	6,330	62	7.0	4,120	3.36
MW-62-065	BR	10/01/19	GW	29.7	7.3	6,730	200	3.0	4,360	4.05
MW-62-065	BR	12/03/19	GW	28.9	7.7	6,420	99	11	4,180	3.50
MW-62-110	BR	02/14/19	GW	26.9	7.3	10,200	-50	2.0	7,570	6.33
MW-62-110	BR	05/22/19	GW	27.3	7.5	13,900	-61	1.0	9,010	8.01
MW-62-110	BR	09/25/19	GW	28.3	7.4	12,800	16	3.0	8,510	7.50
MW-62-110	BR	12/04/19	GW	27.6	7.5	11,000	-15	2.0	6,900	6.03
MW-62-190	BR	05/22/19	GW	27.6	7.7	19,400	-94	2.0	12,660	11.57
MW-62-190	BR	12/04/19	GW	27.6	7.5	19,000	-17	2.0	12,360	11.26
MW-63-065	BR	02/14/19	GW	22.6	6.9	7,060	62	26	4,590	3.89
MW-63-065	BR	05/21/19	GW	30.5	7.1	7051	15	9.0	4,490	3.84
MW-63-065	BR	09/26/19	GW	26.7	7.4	6,750	120	11	4,660	3.93
MW-63-065	BR	12/06/19	GW	26.4	7.1	7,730	-54	5.0	5,020	4.34
MW-64BR	BR	02/13/19	GW	25.3	7.0	13,000	-42	2.0	8,850	7.42
MW-64BR	BR	05/21/19	GW	26.8	7.2	14,400	-69	5.0	9,330	8.30
MW-64BR	BR	08/22/19	GW	33.6	7.7	14,700	12	3.0	9,550	8.37
MW-64BR	BR	12/06/19	GW	22.3	7.5	14,200	52	1.0	9,220	8.22
MW-65-160	SA	02/13/19	GW	26.3	6.8	3,840	25	8.0	2,620	2.04
MW-65-160	SA	05/16/19	GW	32.2	7.3	9,610	100	20	6,230	5.37
MW-65-160	SA	09/26/19	GW	30.7	7.4	4,030	41	9.0	2,610	2.11
MW-65-160	SA	12/03/19	GW	26.2	7.1	4,270	88	6.0	2,760	2.26
MW-65-225	DA	02/13/19	GW	29.8	6.8	8,340	27	14	5,890	4.56
MW-65-225	DA	05/16/19	GW	29.1	7.2	2,970	110	27	1,930	1.55
MW-65-225	DA	09/26/19	GW	32.0	7.3	10,800	30	4.0	7,030	6.07
MW-65-225	DA	12/03/19	GW	29.8	7.3	7,210	80	5.0	4,720	3.99

Appendix D

Field Water Quality Parameters, 2019 Annual Reporting Period

Fourth Quarter 2019 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	Matrix	Temperature (°C)	pH (SU)	Specific Conductance (µS/cm)	ORP (mV)	Turbidity (NTU)	Total Dissolved Solids (mg/L)	Salinity (PPT)
MW-66-165	SA	05/16/19	GW	33.3	7.0	4,260	-24	45	2,760	2.23
MW-66-165	SA	12/03/19	GW	30.6	7.2	3,960	90	25	2,560	2.07
MW-66-230	DA	05/16/19	GW	30.6	7.4	20,400	-92	3.0	13,290	12.11
MW-66-230	DA	12/03/19	GW	29.6	7.9	19,000	51	8.0	12,360	11.25
MW-66BR-270	BR	05/22/19	GW	31.0	9.6	2,430	-300	1.0	1,580	1.24
MW-66BR-270	BR	12/10/19	GW	30.8	8.9	18,500	-110	8.0	12,010	10.86
MW-67-185	SA	05/16/19	GW	34.4	6.9	8,340	-22	5.0	5,420	4.58
MW-67-185	SA	12/04/19	GW	23.1	7.8	7,020	88	35	4,560	3.85
MW-67-225	MA	05/16/19	GW	33.6	7.2	7,360	-35	45	4,790	4.01
MW-67-225	MA	12/04/19	GW	30.7	8.2	6,530	55	15	4,260	3.56
MW-67-260	DA	05/16/19	GW	33.4	8.4	19,100	-54	1.0	12,410	11.21
MW-67-260	DA	12/04/19	GW	26.6	8.8	18,800	-7.3	9.0	12,280	11.10
MW-68-180	SA	02/13/19	GW	28.4	7.0	5,010	63	49	3,410	2.67
MW-68-180	SA	05/22/19	GW	29.1	7.5	3,020	42	46	2,080	1.62
MW-68-180	SA	09/26/19	GW	31.2	7.6	3,530	56	26	2,300	1.85
MW-68-180	SA	12/04/19	GW	25.8	7.4	5,440	73	39	3,530	2.93
MW-68-240	DA	05/23/19	GW	31.4	6.9	18,000	-60	15	11,340	10.34
MW-68-240	DA	12/04/19	GW	31.4	7.5	17,400	13	8.0	11,330	10.19
MW-68BR-280	BR	05/22/19	GW	29.3	8.8	11,500	-54	1.0	7,430	6.49
MW-68BR-280	BR	12/04/19	GW	26.9	8.4	22,400	31	2.0	14,500	13.40
MW-69-195	BR	02/13/19	GW	29.5	7.1	2,860	43	18	1,960	1.55
MW-69-195	BR	05/16/19	GW	32.6	7.2	2,810	-18	19	1,330	1.43
MW-69-195	BR	09/26/19	GW	27.4	7.8	2,570	16	25	1,660	1.31
MW-69-195	BR	12/03/19	GW	24.6	7.4	2,780	75	32	1,800	1.44
MW-70-105	BR	05/21/19	GW	30.3	7.8	3,570	48	10	4,480	3.75
MW-70-105	BR	12/17/19	GW	28.8	7.9	2,970	32	35	1,920	1.63
MW-70BR-225	BR	05/21/19	GW	29.4	7.4	9,090	120	1.0	5,880	5.01
MW-70BR-225	BR	12/17/19	GW	28.6	7.7	13,100	60	8.0	8,520	7.51
MW-71-035	SA	05/23/19	GW	66.4	7.2	15,200	66	15	9,860	8.80
MW-71-035	SA	12/18/19	GW	26.5	7.4	16,500	60	16	10,800	9.74
MW-72-080	BR	02/11/19	GW	29.0	7.2	22,100	-110	8.0	14,980	13.20
MW-72-080	BR	05/24/19	GW	27.8	7.8	17	120	21	20,580	19.65
MW-72-080	BR	08/22/19	GW	29.0	8.0	15,700	170	33	10,280	9.19
MW-72-080	BR	12/06/19	GW	26.9	7.7	17,500	-260	5.0	11,110	10.87
MW-72BR-200	BR	02/12/19	GW	27.5	7.8	14,800	-79	5.0	10,200	8.66
MW-72BR-200	BR	08/22/19	GW	30.3	8.2	14,000	100	26	9,100	8.19
MW-72BR-200	BR	12/06/19	GW	27.4	8.0	14,900	-140	8.0	9,650	8.63
MW-72BR-200_D	BR	02/12/19	GW	24.0	7.4	15,200	-160	3.0	10,200	8.73
MW-72BR-200_S	BR	02/12/19	GW	23.8	7.3	14,900	-150	11	10,130	8.67
MW-72BR-200_S	BR	05/23/19	GW	27.4	8.0	11,800	-210	227	7,660	6.66
MW-73-080	BR	02/11/19	GW	27.9	7.0	16,900	-71	14	13,110	12.02
MW-73-080	BR	05/23/19	GW	29.9	7.5	12,200	25	8.0	7,930	6.86
MW-73-080	BR	08/22/19	GW	28.9	7.6	12,300	130	45	7,660	6.70
MW-73-080	BR	12/06/19	GW	27.4	7.4	9,310	77	14	6,050	5.19
MW-74-240	BR	05/22/19	GW	27.7	8.4	821	-46	86	530	0.40
MW-74-240	BR	12/05/19	GW	26.4	8.0	789	41	24	500	0.38
OW-03D	DA	12/19/19	GW	30.0	8.0	10,600	15	2.0	6,910	5.97
OW-03M	MA	12/19/19	GW	29.6	8.0	6,730	22	4.0	4,370	3.59
OW-03S	SA	12/19/19	GW	30.2	7.8	1,400	68	5.0	910	0.70
PE-01	DA	03/05/19	GW	20.8	7.7	6	73	1.0	3,420	2.84
PE-01	DA	04/23/19	GW	22.1	7.1	3,270	180	2.0	2.11	1.70
PE-01	DA	05/09/19	GW	24.5	7.4	2,820	170	2.0	2,200	1.85
PE-01	DA	06/05/19	GW	28.8	7.8	3,470	-45	1.0	--	--
PE-01	DA	07/24/19	GW	34.8	7.2	3,700	130	2.0	2,599	1.91

Appendix D

Field Water Quality Parameters, 2019 Annual Reporting Period

Fourth Quarter 2019 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	Matrix	Temperature (°C)	pH (SU)	Specific Conductance (µS/cm)	ORP (mV)	Turbidity (NTU)	Total Dissolved Solids (mg/L)	Salinity (PPT)
PE-01	DA	08/07/19	GW	33.1	7.5	2,710	-11	1.0	--	--
PE-01	DA	08/22/19	GW	33.6	7.6	98	160	2.0	60	0.04
PE-01	DA	09/04/19	GW	24.2	7.4	3,070	63	--	1.9959	1.58
PE-01	DA	10/03/19	GW	20.9	7.7	3,680	31	2.0	2,390	1.94
PE-01	DA	11/07/19	GW	20.1	6.9	5,020	-42	2.0	--	--
PE-01	DA	12/04/19	GW	18.8	7.6	5,120	180	4.0	3,330	2.77
PGE-07BR	BR	12/04/19	GW	31.4	7.4	21,500	-300	33	13,910	12.74
PGE-08	BR	12/10/19	GW	30.4	8.3	21,100	-98	1.0	13,680	12.57
PM-03	MA	12/16/19	GW	26.8	7.9	1,490	89	2.0	960	0.75
PM-04	MA	12/16/19	GW	27.9	8.0	2,560	59	2.0	1,670	1.33
R-19	--	02/13/19	SW	9.80	7.9	965	140	1.0	630	0.48
R-19	--	03/20/19	SW	13.8	8.3	989	110	1.0	640	0.49
R-19	--	06/19/19	SW	21.3	7.9	939	94	1.0	610	0.46
R-19	--	08/22/19	SW	22.2	8.1	954	60	2.0	610	0.47
R-19	--	11/21/19	SW	16.2	8.1	945	120	35	610	0.47
R-28	--	02/12/19	SW	13.6	7.7	1,110	39	36	720	0.55
R-28	--	03/19/19	SW	14.3	7.9	992	110	1.0	650	0.49
R-28	--	06/18/19	SW	21.6	8.1	567	98	2.0	370	0.27
R-28	--	08/21/19	SW	23.0	8.1	958	63	3.0	620	0.47
R-28	--	11/20/19	SW	17.1	8.1	951	110	2.0	610	0.47
R63	--	02/12/19	SW	11.7	7.9	1,130	38	5.0	720	0.56
R63	--	03/19/19	SW	14.2	8.0	999	110	1.0	650	0.50
R63	--	06/18/19	SW	22.1	8.1	939	96	2.0	610	0.46
R63	--	08/21/19	SW	22.2	8.2	956	67	3.0	620	0.47
R63	--	11/20/19	SW	16.9	8.2	939	110	3.0	610	0.47
RRB	--	02/13/19	SW	9.90	7.9	981	120	2.0	630	0.49
RRB	--	03/20/19	SW	13.7	8.1	1,000	110	2.0	650	0.50
RRB	--	06/19/19	SW	22.1	8.1	954	93	2.0	610	0.47
RRB	--	08/22/19	SW	21.6	8.0	981	58	3.0	620	0.47
RRB	--	11/21/19	SW	15.9	7.9	2,960	130	9.0	1,900	1.54
SW1	--	02/12/19	SW	13.0	7.7	1,230	55	28	790	0.62
SW1	--	03/19/19	SW	14.1	8.0	1,000	100	34	650	0.50
SW1	--	06/18/19	SW	22.1	7.8	1,020	70	4.0	660	0.50
SW1	--	08/21/19	SW	23.6	8.0	1,020	63	8.0	660	0.50
SW1	--	11/21/19	SW	16.9	7.9	924	120	39	590	0.46
SW2	--	02/12/19	SW	11.8	7.5	1,170	49	1.0	760	0.59
SW2	--	03/19/19	SW	15.2	8.0	1,000	90	12	350	0.50
SW2	--	06/18/19	SW	22.2	7.7	1,000	73	2.0	650	0.50
SW2	--	08/21/19	SW	23.3	8.0	1,020	57	6.0	650	0.50
SW2	--	11/21/19	SW	16.3	7.7	1,020	110	33	660	0.51
TW-01	SA	05/24/19	GW	29.7	7.2	4,660	150	1.0	3,000	2.00
TW-01	SA	12/03/19	GW	29.0	7.3	10,400	-120	1.0	6,660	5.82
TW-02D	DA	02/14/19	GW	18.6	7.7	4,970	94	1.0	3,220	2.67
TW-02D	DA	04/23/19	GW	21.7	7.2	3,840	190	2.0	2,450	2.03
TW-02D	DA	10/03/19	GW	26.6	7.5	5,760	46	3.0	3,750	3.11
TW-02D	DA	12/04/19	GW	18.2	7.8	5,090	200	12	3,310	2.76
TW-03D	DA	03/05/19	GW	25.4	7.7	9,890	76	2.0	6,430	5.56
TW-03D	DA	04/23/19	GW	20.5	7.2	9,260	140	2.0	6.42	5.56
TW-03D	DA	05/09/19	GW	25.7	7.2	4,000	190	2.0	400	0.02
TW-03D	DA	06/05/19	GW	27.5	7.8	8,290	110	1.0	--	--
TW-03D	DA	07/24/19	GW	27.5	7.7	7,970	70	3.0	5,180	4.40
TW-03D	DA	08/07/19	GW	29.9	7.2	9,200	7.9	1.0	--	--
TW-03D	DA	08/22/19	GW	26.4	7.7	5,620	120	3.0	2,890	2.48
TW-03D	DA	09/04/19	GW	23.1	7.3	9	62	1.0	5,902	5.05

Appendix D

Field Water Quality Parameters, 2019 Annual Reporting Period

Fourth Quarter 2019 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	Matrix	Temperature (°C)	pH (SU)	Specific Conductance (µS/cm)	ORP (mV)	Turbidity (NTU)	Total Dissolved Solids (mg/L)	Salinity (PPT)
TW-03D	DA	10/03/19	GW	25.0	7.8	7,240	62	3.0	4,700	3.98
TW-03D	DA	11/07/19	GW	25.1	7.3	7,680	92	1.0	--	--
TW-03D	DA	12/04/19	GW	19.1	7.6	7,180	200	2.0	4,690	3.98
TW-04	DA	05/16/19	GW	28.5	7.5	10,700	140	1.0	7,070	6.38
TW-04	DA	12/12/19	GW	27.8	7.2	22,800	290	1.0	14,560	14.25
TW-05	DA	05/20/19	GW	29.2	7.6	12,700	21	7.0	8,260	7.24
TW-05	DA	12/12/19	GW	28.3	7.2	16,600	140	1.0	10,680	10.24

Notes:

1. 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.

-- = not applicable.
°C = degrees Celsius.
µS/cm = microSiemens per centimeter.
BR = bedrock.
DA = deep interval of Alluvial Aquifer.
GW = groundwater
ID = identification.
J = concentration or reporting limit (RL) estimated by laboratory or data validation.
LF = Low Flow (minimal drawdown).
MA = mid-depth interval of Alluvial Aquifer.
mg/L = milligrams per liter.
mV = millivolts.
NTU = nephelometric turbidity units.
ORP = oxidation-reduction potential.
PPT = parts per thousand.
SA = shallow interval of Alluvial Aquifer.
SU = standard units.
SW = surface water.

APPENDIX E

Historical Cr(VI) and Dissolved Chromium Concentrations, January 2018 – December 2019

Appendix E

Historical Cr(VI) and Dissolved Chromium Concentrations, January 2018 through December 2019

Fourth Quarter 2019 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 Type	Sample Method	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)
MW-09	SA	02/23/2018		LF	150	150
MW-09	SA	05/02/2018		LF	150	140
MW-09	SA	12/12/2018		LF	140	150
MW-09	SA	03/18/2019		LF	140	130
MW-09	SA	05/17/2019		LF	150	150
MW-09	SA	09/30/2019		LF	130	150
MW-09	SA	12/18/2019		LF	120	120
MW-10	SA	02/23/2018		LF	160	160
MW-10	SA	05/02/2018		LF	170	160
MW-10	SA	12/12/2018		LF	110	120
MW-10	SA	03/18/2019		LF	150	140
MW-10	SA	03/18/2019	FD	--	150	140
MW-10	SA	05/17/2019		LF	180	180
MW-10	SA	05/17/2019	FD	--	180	180
MW-10	SA	09/30/2019		LF	110	110
MW-10	SA	12/18/2019		LF	220	230
MW-11	SA	02/23/2018		LF	57	56
MW-11	SA	05/02/2018		LF	57	53
MW-11	SA	05/02/2018	FD	--	58	55
MW-11	SA	12/12/2018		LF	47	48
MW-11	SA	12/12/2018	FD	--	47	50
MW-11	SA	03/18/2019		LF	42	43
MW-11	SA	05/17/2019		LF	51	49
MW-11	SA	09/30/2019		LF	44	47
MW-11	SA	12/18/2019		LF	37	35
MW-12	SA	05/01/2018		LF	1,500	1,600
MW-12	SA	12/11/2018		LF	1,500	1,500
MW-12	SA	05/22/2019		LF	1,600	1,600
MW-12	SA	12/17/2019		LF	1,600	1,800
MW-14	SA	05/01/2018		LF	13	14
MW-14	SA	12/11/2018		LF	13	15
MW-14	SA	05/15/2019		LF	14	13
MW-14	SA	12/09/2019		LF	10	8.8
MW-19	SA	04/27/2018		LF	370	380
MW-19	SA	12/10/2018		LF	670	780
MW-19	SA	05/15/2019		LF	250	250
MW-19	SA	12/12/2019		LF	130	120
MW-20-070	SA	04/27/2018		LF	1,700	1,700
MW-20-070	SA	12/11/2018		LF	1,600	1,700
MW-20-070	SA	12/11/2018	FD	--	1,600	1,800
MW-20-070	SA	05/24/2019		LF	1,700	1,800
MW-20-070	SA	12/13/2019		LF	2,300	2,200
MW-20-100	MA	04/27/2018		LF	1,800	1,800
MW-20-100	MA	12/04/2018		LF	1,400	1,500

Appendix E

Historical Cr(VI) and Dissolved Chromium Concentrations, January 2018 through December 2019

Fourth Quarter 2019 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 Type	Sample Method	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)
MW-20-100	MA	05/24/2019		LF	1,300	1,500
MW-20-100	MA	12/13/2019		LF	750	780
MW-20-130	DA	04/27/2018		LF	6,900	7,000
MW-20-130	DA	12/04/2018		LF	5,800	6,100
MW-20-130	DA	05/24/2019		LF	5,900	6,800
MW-20-130	DA	05/24/2019	FD	--	6,000	6,800
MW-20-130	DA	12/13/2019		LF	5,900	6,000
MW-21	SA	05/02/2018		LF	ND (1.0)	1.0
MW-21	SA	05/02/2018	FD	--	ND (1.0)	ND (1.0)
MW-21	SA	12/12/2018		LF	1.1	1.2
MW-21	SA	05/23/2019		LF	6.5	6.7
MW-21	SA	12/13/2019		LF	ND (1.0)	8.9
MW-22	SA	04/23/2018		LF	ND (1.0)	ND (5.0)
MW-22	SA	12/04/2018		LF	ND (1.0)	ND (1.0)
MW-22	SA	12/04/2018	FD	--	ND (1.0)	ND (1.0)
MW-22	SA	04/23/2019		LF	ND (1.0)	ND (1.0)
MW-22	SA	12/11/2019		LF	ND (1.0)	ND (1.0)
MW-22	SA	12/11/2019	FD	--	ND (1.0)	ND (1.0)
MW-23-060	BR	04/26/2018		LF	39	37 J
MW-23-060	BR	12/11/2018		LF	39	40
MW-23-060	BR	05/21/2019		LF	40	35
MW-23-060	BR	12/09/2019		LF	41	34
MW-23-080	BR	04/26/2018		LF	ND (1.0)	1.5
MW-23-080	BR	12/11/2018		LF	ND (1.0)	3.2
MW-23-080	BR	05/21/2019		LF	ND (1.0)	1.1
MW-23-080	BR	12/09/2019		LF	ND (1.0)	1.1
MW-24A	SA	05/02/2018		LF	ND (0.2)	ND (1.0)
MW-24A	SA	12/12/2018		LF	ND (0.2)	ND (1.0)
MW-24A	SA	05/17/2019		LF	ND (0.2)	ND (1.0)
MW-24A	SA	12/03/2019		LF	ND (0.2)	1.8
MW-24B	DA	05/02/2018		LF	200	200
MW-24B	DA	12/12/2018		LF	160	150
MW-24B	DA	05/17/2019		LF	86	73
MW-24B	DA	05/17/2019	FD	--	84	73
MW-24B	DA	12/03/2019		LF	230	220
MW-24B	DA	12/03/2019	FD	--	230	230
MW-25	SA	05/01/2018		LF	68	65
MW-25	SA	12/10/2018		LF	100	100
MW-25	SA	12/10/2018	FD	--	100	100
MW-25	SA	05/15/2019		LF	68	66
MW-25	SA	12/09/2019		LF	72	69
MW-25	SA	12/09/2019	FD	--	74	71
MW-26	SA	05/01/2018		LF	2,300	2,400
MW-26	SA	12/07/2018		LF	2,200	2,300

Appendix E

Historical Cr(VI) and Dissolved Chromium Concentrations, January 2018 through December 2019

Fourth Quarter 2019 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 Type	Sample Method	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)
MW-26	SA	05/22/2019		LF	2,300	2,500
MW-26	SA	12/12/2019		LF	2,300	2,300
MW-26	SA	12/12/2019	FD	--	2,300	2,400
MW-27-085	DA	04/24/2018		LF	ND (1.0)	ND (1.0)
MW-27-085	DA	12/05/2018		LF	ND (1.0)	ND (1.0)
MW-27-085	DA	04/22/2019		LF	ND (0.2)	ND (1.0)
MW-27-085	DA	12/10/2019		LF	ND (0.2)	ND (1.0)
MW-28-025	SA	04/25/2018		LF	ND (0.2)	ND (1.0)
MW-28-025	SA	04/25/2018	FD	--	ND (0.2)	ND (1.0)
MW-28-025	SA	12/14/2018		LF	ND (0.2)	ND (1.0)
MW-28-025	SA	05/21/2019		LF	ND (0.2)	ND (1.0)
MW-28-025	SA	12/09/2019		LF	ND (0.2)	ND (1.0)
MW-28-090	DA	04/25/2018		LF	ND (0.2)	ND (1.0)
MW-28-090	DA	12/14/2018		LF	ND (0.2)	ND (1.0)
MW-28-090	DA	05/21/2019		LF	ND (0.2)	ND (1.0)
MW-28-090	DA	12/09/2019		LF	ND (0.2)	ND (1.0)
MW-29	SA	04/25/2018		LF	ND (0.2)	ND (1.0)
MW-29	SA	12/10/2018		LF	ND (0.2)	ND (1.0)
MW-29	SA	05/21/2019		LF	ND (0.2)	ND (1.0)
MW-29	SA	12/10/2019		LF	ND (0.2)	ND (1.0)
MW-31-060	SA	04/27/2018		LF	380	390
MW-31-060	SA	12/10/2018		LF	390	400
MW-31-060	SA	05/20/2019		LF	250	240
MW-31-060	SA	05/20/2019	FD	--	250	240
MW-31-060	SA	12/12/2019		LF	370	370
MW-31-060	SA	12/12/2019	FD	--	370	360
MW-32-035	SA	04/23/2018		LF	ND (1.0)	ND (1.0)
MW-32-035	SA	12/04/2018		LF	ND (1.0)	ND (1.0)
MW-32-035	SA	04/23/2019		LF	ND (0.2)	ND (1.0)
MW-32-035	SA	12/09/2019		LF	ND (1.0)	ND (1.0)
MW-33-040	SA	04/25/2018		LF	ND (1.0)	1.2
MW-33-040	SA	12/07/2018		LF	ND (1.0)	ND (1.0)
MW-33-040	SA	04/23/2019		LF	ND (0.2)	ND (1.0)
MW-33-040	SA	12/05/2019		LF	ND (1.0)	ND (1.0)
MW-33-040	SA	12/05/2019	FD	--	ND (1.0)	ND (1.0)
MW-33-090	MA	04/24/2018		LF	3.3	3.8
MW-33-090	MA	12/07/2018		LF	1.2	1.7
MW-33-090	MA	12/07/2018	FD	--	9.3	10
MW-33-090	MA	04/22/2019		LF	2.5	5.5
MW-33-090	MA	12/05/2019		LF	2.7	3.8
MW-33-090	MA	12/05/2019	FD	--	2.8	3.9
MW-33-150	DA	04/25/2018		LF	5.2	5.0
MW-33-150	DA	12/07/2018		LF	3.9	6.2
MW-33-150	DA	05/21/2019		LF	5.5	21
MW-33-150	DA	12/05/2019		LF	2.0	7.7

Appendix E

Historical Cr(VI) and Dissolved Chromium Concentrations, January 2018 through December 2019

Fourth Quarter 2019 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 Type	Sample Method	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)
MW-33-150	DA	12/05/2019	FD	--	1.9	7.6
MW-33-210	DA	04/25/2018		LF	6.0	5.9
MW-33-210	DA	12/07/2018		LF	6.7	10
MW-33-210	DA	04/22/2019		LF	10	9.2
MW-33-210	DA	12/05/2019		LF	13	15
MW-33-210	DA	12/05/2019	FD	--	13	15
MW-34-080	DA	04/24/2018		LF	ND (1.0)	ND (1.0)
MW-34-080	DA	12/05/2018		LF	ND (1.0)	ND (1.0)
MW-34-080	DA	04/24/2019		LF	ND (0.2)	ND (1.0)
MW-34-080	DA	12/10/2019		LF	ND (0.2)	ND (1.0)
MW-34-080	DA	12/10/2019	FD	--	ND (0.2)	ND (1.0)
MW-34-100	DA	02/20/2018		LF	ND (1.0)	1.5
MW-34-100	DA	04/24/2018		LF	ND (1.0)	1.1
MW-34-100	DA	04/24/2018	FD	--	ND (1.0)	1.3
MW-34-100	DA	10/01/2018		LF	ND (1.0)	ND (1.0)
MW-34-100	DA	12/05/2018		LF	ND (1.0)	ND (1.0)
MW-34-100	DA	02/14/2019		LF	ND (1.0)	1.7
MW-34-100	DA	04/24/2019		LF	ND (0.2)	ND (1.0)
MW-34-100	DA	10/01/2019		LF	ND (0.2)	ND (1.0)
MW-34-100	DA	12/10/2019		LF	ND (1.0)	1.6
MW-34-100	DA	12/10/2019	FD	--	ND (1.0)	1.9
MW-35-060	SA	04/27/2018		LF	22	24
MW-35-060	SA	12/10/2018		LF	20	20
MW-35-060	SA	05/24/2019		LF	24	22
MW-35-060	SA	12/13/2019		LF	24	21
MW-35-135	DA	04/27/2018		LF	26	25
MW-35-135	DA	12/10/2018		LF	25	25
MW-35-135	DA	05/24/2019		LF	28	24
MW-35-135	DA	12/13/2019		LF	28	25
MW-35-135	DA	12/13/2019	FD	--	28	24
MW-36-090	DA	04/24/2018		LF	ND (0.2)	ND (1.0)
MW-36-090	DA	12/06/2018		LF	ND (0.2)	ND (1.0)
MW-36-090	DA	12/06/2018	FD	--	ND (0.2)	ND (1.0)
MW-36-090	DA	04/24/2019		LF	ND (0.2)	ND (1.0)
MW-36-090	DA	12/04/2019		LF	ND (0.2)	ND (1.0)
MW-36-100	DA	04/24/2018		LF	6.6	11
MW-36-100	DA	12/06/2018		LF	3.3	6.8
MW-36-100	DA	04/24/2019		LF	7.4	11
MW-36-100	DA	04/24/2019	FD	--	7.1	11
MW-36-100	DA	12/04/2019		LF	7.5	9.8
MW-37D	DA	05/03/2018		LF	7.4	7.1
MW-37D	DA	12/06/2018		LF	5.1	5.0
MW-37D	DA	05/20/2019		LF	6.2	6.0
MW-37D	DA	12/19/2019		LF	4.8	4.5
MW-38D	DA	05/02/2018		3V	15	14

Appendix E

Historical Cr(VI) and Dissolved Chromium Concentrations, January 2018 through December 2019

Fourth Quarter 2019 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 Type	Sample Method	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)
MW-38D	DA	05/02/2018		LF	15	14
MW-38D	DA	12/12/2018		3V	20	20
MW-38D	DA	12/12/2018		LF	21	21
MW-38D	DA	05/17/2019		LF	21	17
MW-38D	DA	12/18/2019		LF	19	21
MW-38S	SA	02/23/2018		3V	2.8	2.4
MW-38S	SA	02/23/2018		LF	2.8	2.5
MW-38S	SA	05/02/2018		3V	1.1	1.3
MW-38S	SA	05/02/2018		LF	1.8	2.0
MW-38S	SA	09/27/2018		3V	2.7	2.8
MW-38S	SA	09/27/2018		LF	3.0	3.3
MW-38S	SA	12/12/2018		3V	3.9	4.3
MW-38S	SA	12/12/2018		LF	4.2	4.7
MW-38S	SA	02/13/2019		LF	5.1	5.6
MW-38S	SA	05/17/2019		LF	6.0	5.7
MW-38S	SA	09/25/2019		LF	4.8	4.7
MW-38S	SA	12/18/2019		LF	4.7	4.5
MW-38S-SMT	SA	02/13/2019		3V	3.7	3.8
MW-39-100	DA	04/24/2018		LF	57	54
MW-39-100	DA	12/06/2018		LF	63	70
MW-39-100	DA	04/24/2019		LF	88	89
MW-39-100	DA	12/05/2019		LF	87	82
MW-40D	DA	04/25/2018		H	25	31
MW-40D	DA	04/25/2018		LF	120	120
MW-40D	DA	12/12/2018		H	ND (1.0)	ND (1.0)
MW-40D	DA	12/12/2018		LF	140	140
MW-40D	DA	05/22/2019		LF	120	120
MW-40D	DA	05/22/2019	FD	--	120	120
MW-40D	DA	12/11/2019		LF	150	130
MW-40S	SA	04/25/2018		H	18	17
MW-40S	SA	04/25/2018		LF	20	20
MW-40S	SA	12/12/2018		H	17	29
MW-40S	SA	12/12/2018		LF	11	11
MW-40S	SA	05/22/2019		H	12	15
MW-40S	SA	12/11/2019		H	17	17
MW-41D	DA	05/04/2018		LF	ND (1.0)	ND (1.0)
MW-41D	DA	12/13/2018		LF	ND (1.0)	ND (5.0)
MW-41D	DA	05/15/2019		LF	ND (1.0)	ND (1.0)
MW-41D	DA	12/17/2019		LF	ND (1.0)	1.8
MW-42-055	MA	04/24/2018		LF	ND (0.2)	ND (1.0)
MW-42-055	MA	12/05/2018		LF	ND (0.2)	ND (1.0)
MW-42-055	MA	04/23/2019		LF	ND (0.2)	ND (1.0)
MW-42-055	MA	12/11/2019		LF	ND (0.2)	ND (1.0)
MW-42-065	MA	04/24/2018		LF	ND (0.2)	ND (1.0)
MW-42-065	MA	12/05/2018		LF	ND (0.2)	ND (1.0)

Appendix E

Historical Cr(VI) and Dissolved Chromium Concentrations, January 2018 through December 2019

Fourth Quarter 2019 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 Type	Sample Method	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)
MW-42-065	MA	04/23/2019		LF	ND (0.2)	ND (1.0)
MW-42-065	MA	12/11/2019		LF	ND (0.2)	ND (1.0)
MW-44-070	MA	04/24/2018		LF	ND (0.2)	ND (1.0)
MW-44-070	MA	12/05/2018		LF	ND (0.2)	ND (1.0)
MW-44-070	MA	04/24/2019		LF	ND (0.2)	ND (1.0)
MW-44-070	MA	12/11/2019		LF	ND (0.2)	ND (1.0)
MW-44-115	DA	02/20/2018		LF	13	12
MW-44-115	DA	02/20/2018	FD	--	13	12
MW-44-115	DA	04/24/2018		LF	8.9	9.5
MW-44-115	DA	10/01/2018		LF	6.4	7.0
MW-44-115	DA	12/05/2018		LF	6.4	5.8
MW-44-115	DA	02/15/2019		LF	9.7	17
MW-44-115	DA	04/24/2019		LF	6.0	6.1
MW-44-115	DA	10/01/2019		LF	6.2	6.3
MW-44-115	DA	12/11/2019		LF	6.7	7.3
MW-44-125	DA	04/24/2018		LF	ND (0.2)	3.1
MW-44-125	DA	12/05/2018		LF	ND (1.0)	ND (1.0)
MW-44-125	DA	12/05/2018	FD	--	ND (1.0)	ND (1.0)
MW-44-125	DA	04/24/2019		LF	1.9	10
MW-44-125	DA	12/11/2019		LF	2.6	3.8
MW-46-175	DA	02/20/2018		LF	13	12
MW-46-175	DA	04/25/2018		LF	7.4	8.3
MW-46-175	DA	10/02/2018		LF	6.5	7.0
MW-46-175	DA	10/02/2018	FD	--	6.5	7.0
MW-46-175	DA	12/13/2018		LF	8.2	12
MW-46-175	DA	02/15/2019		LF	8.1	18
MW-46-175	DA	02/15/2019	FD	--	7.9	20
MW-46-175	DA	05/21/2019		LF	7.6	9.1
MW-46-175	DA	10/01/2019		LF	6.0	6.1
MW-46-175	DA	12/04/2019		LF	5.1	6.3
MW-46-205	DA	04/25/2018		LF	ND (1.0)	ND (1.0)
MW-46-205	DA	12/13/2018		LF	ND (1.0)	ND (1.0)
MW-46-205	DA	05/21/2019		LF	2.4	2.7
MW-46-205	DA	12/04/2019		LF	ND (1.0)	6.2
MW-47-055	SA	04/26/2018		LF	15	15
MW-47-055	SA	04/26/2018	FD	--	14	14
MW-47-055	SA	12/10/2018		LF	21	21
MW-47-055	SA	05/16/2019		LF	17	15
MW-47-055	SA	05/16/2019	FD	--	17	15
MW-47-055	SA	12/04/2019		LF	21	18
MW-47-115	DA	04/25/2018		LF	23	23
MW-47-115	DA	12/10/2018		LF	15	15
MW-47-115	DA	12/10/2018	FD	--	15	15
MW-47-115	DA	05/16/2019		LF	27	23
MW-47-115	DA	12/04/2019		LF	16	22

Appendix E

Historical Cr(VI) and Dissolved Chromium Concentrations, January 2018 through December 2019

Fourth Quarter 2019 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 Type	Sample Method	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)
MW-48	BR	05/03/2018		LF	ND (1.0)	ND (1.0)
MW-48	BR	12/13/2018		LF	ND (1.0)	ND (5.0)
MW-48	BR	05/23/2019		LF	ND (1.0)	ND (1.0)
MW-48	BR	12/19/2019		3V	ND (1.0)	ND (1.0)
MW-50-095	MA	04/27/2018		LF	11	10
MW-50-095	MA	12/10/2018		LF	13	14
MW-50-095	MA	05/20/2019		LF	13	12
MW-50-095	MA	12/12/2019		LF	13	14
MW-50-200	DA	04/27/2018		LF	6,500	6,800
MW-50-200	DA	12/10/2018		LF	3,100	3,700
MW-50-200	DA	05/20/2019		LF	5,800	6,200
MW-50-200	DA	12/12/2019		LF	2,200	2,100
MW-50-200	DA	12/12/2019	FD	--	2,200	2,100
MW-51	MA	05/01/2018		LF	3,500	3,700
MW-51	MA	12/10/2018		LF	3,300	3,800
MW-51	MA	05/22/2019		LF	3,300	3,800
MW-51	MA	12/12/2019		LF	3,600	3,900
MW-51	MA	12/12/2019	FD	--	3,600	4,000
MW-52D	DA	04/23/2018		LF	ND (1.0)	ND (5.0)
MW-52D	DA	12/04/2018		LF	ND (1.0)	ND (1.0)
MW-52D	DA	04/23/2019		LF	ND (1.0)	ND (1.0)
MW-52D	DA	04/23/2019	FD	--	ND (1.0)	ND (1.0)
MW-52D	DA	12/12/2019		LF	ND (1.0)	ND (1.0)
MW-52M	DA	04/23/2018		LF	ND (1.0)	ND (5.0)
MW-52M	DA	12/04/2018		LF	ND (1.0)	ND (1.0)
MW-52M	DA	04/23/2019		LF	ND (1.0)	ND (1.0)
MW-52M	DA	12/12/2019		LF	ND (1.0)	ND (1.0)
MW-52S	MA	04/24/2018		LF	ND (1.0)	ND (1.0)
MW-52S	MA	12/04/2018		LF	ND (1.0)	ND (1.0)
MW-52S	MA	04/23/2019		LF	ND (0.2)	ND (1.0)
MW-52S	MA	12/12/2019		LF	ND (0.2)	ND (1.0)
MW-53D	DA	04/23/2018		LF	ND (1.0)	ND (1.0)
MW-53D	DA	12/04/2018		LF	ND (1.0)	ND (1.0)
MW-53D	DA	04/23/2019		LF	ND (1.0)	ND (1.0)
MW-53D	DA	12/12/2019		LF	ND (1.0)	ND (1.0)
MW-53M	DA	04/23/2018		LF	ND (1.0)	ND (1.0)
MW-53M	DA	12/04/2018		LF	ND (1.0)	ND (1.0)
MW-53M	DA	04/23/2019		LF	ND (1.0)	ND (1.0)
MW-53M	DA	12/12/2019		LF	ND (1.0)	ND (1.0)
MW-54-085	DA	05/04/2018	(a)	LF	ND (0.1)	ND (0.2)
MW-54-085	DA	12/13/2018	(a)	LF	ND (0.1 J)	ND (2.0)
MW-54-085	DA	05/23/2019	(a)	LF	ND (0.1)	ND (2.0)
MW-54-085	DA	12/10/2019	(a)	LF	ND (0.1)	ND (1.0)
MW-54-140	DA	05/04/2018	(a)	LF	4.95	ND (0.2)
MW-54-140	DA	12/13/2018	(a)	LF	ND (0.5 J)	ND (2.0)

Appendix E

Historical Cr(VI) and Dissolved Chromium Concentrations, January 2018 through December 2019

Fourth Quarter 2019 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 Type	Sample Method	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)
MW-54-140	DA	05/23/2019	(a)	LF	ND (0.5)	ND (2.0)
MW-54-140	DA	12/10/2019	(a)	LF	ND (0.5)	ND (1.0)
MW-54-195	DA	05/04/2018	(a)	LF	5.09	ND (0.2)
MW-54-195	DA	12/13/2018	(a)	LF	ND (0.5 J)	ND (2.0)
MW-54-195	DA	05/23/2019	(a)	LF	ND (0.5)	15.1
MW-54-195	DA	08/22/2019	(a)	LF	ND (0.5)	ND (2.0)
MW-54-195	DA	08/22/2019	(a)	LF	ND (0.5)	ND (2.0)
MW-54-195	DA	12/10/2019	(a)	LF	ND (0.5)	ND (1.0)
MW-55-045	MA	05/03/2018	(a)	LF	ND (0.1)	ND (0.2)
MW-55-045	MA	12/13/2018	(a)	LF	ND (0.1 J)	ND (0.2)
MW-55-045	MA	05/23/2019	(a)	LF	ND (0.1)	ND (2.0)
MW-55-045	MA	12/10/2019	(a)	LF	ND (0.1)	ND (1.0)
MW-55-120	DA	05/03/2018	(a)	LF	8.0	8.35
MW-55-120	DA	12/13/2018	(a)	LF	8.29 J	ND (2.0)
MW-55-120	DA	05/23/2019	(a)	LF	7.49	ND (2.0)
MW-55-120	DA	12/10/2019	(a)	LF	6.55	8.19
MW-56D	DA	05/02/2018	(a)	LF	5.03	ND (0.2)
MW-56D	DA	12/13/2018	(a)	LF	ND (0.5 J)	ND (2.0)
MW-56D	DA	12/13/2018	FD(a)	--	ND (0.5 J)	ND (2.0)
MW-56D	DA	05/23/2019	(a)	LF	ND (0.5)	ND (2.0)
MW-56D	DA	12/10/2019	(a)	LF	ND (0.5)	ND (1.0)
MW-56D	DA	12/10/2019	FD(a)	--	ND (0.5)	ND (1.0)
MW-56M	DA	05/02/2018	(a)	LF	4.99	ND (0.2)
MW-56M	DA	12/13/2018	(a)	LF	ND (0.5 J)	ND (2.0)
MW-56M	DA	05/23/2019	(a)	LF	ND (0.5)	ND (2.0)
MW-56M	DA	12/10/2019	(a)	LF	ND (0.5)	ND (1.0)
MW-56S	SA	05/02/2018	(a)	LF	ND (0.1)	ND (0.2)
MW-56S	SA	12/13/2018	(a)	LF	ND (0.1 J)	ND (2.0)
MW-56S	SA	05/23/2019	(a)	LF	ND (0.1)	ND (2.0)
MW-56S	SA	12/10/2019	(a)	LF	ND (0.1)	ND (1.0)
MW-57-070	BR	05/03/2018		LF	340	360
MW-57-070	BR	12/07/2018		LF	410	420
MW-57-070	BR	05/20/2019		LF	380	400
MW-57-070	BR	12/06/2019		LF	420	390
MW-57-185	BR	05/03/2018		3V	7.7	7.5
MW-57-185	BR	12/07/2018		3V	6.4	5.7
MW-57-185	BR	05/20/2019		LF	4.6	5.2
MW-57-185	BR	05/20/2019	FD	--	4.7	5.1
MW-57-185	BR	12/06/2019		LF	3.7	3.4
MW-57-185_D	BR	05/03/2018		LF	4.8	4.7
MW-57-185_D	BR	12/07/2018		LF	6.2	5.9
MW-57-185_S	BR	05/03/2018		LF	5.3	5.2
MW-57-185_S	BR	12/07/2018		LF	5.4	6.0
MW-58BR	BR	02/19/2018		LF	13	11
MW-58BR	BR	05/03/2018		LF	9.3	9.2

Appendix E

Historical Cr(VI) and Dissolved Chromium Concentrations, January 2018 through December 2019

Fourth Quarter 2019 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 Type	Sample Method	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)
MW-58BR	BR	09/27/2018		LF	9.7	9.6
MW-58BR	BR	12/13/2018		LF	10	11
MW-58BR	BR	02/14/2019		LF	7.4	9.4
MW-58BR	BR	05/21/2019		LF	12	14
MW-58BR	BR	08/19/2019		LF	90	88 J
MW-58BR	BR	08/19/2019	FD	--	90	89 J
MW-58BR	BR	12/13/2019		LF	76	70
MW-59-100	SA	05/03/2018		LF	2,800	3,000
MW-59-100	SA	12/07/2018		LF	3,100	3,300
MW-59-100	SA	12/07/2018	FD	--	3,100	3,100
MW-59-100	SA	05/20/2019		LF	2,000	2,200
MW-59-100	SA	05/20/2019	FD	--	2,200	2,300
MW-59-100	SA	12/13/2019		LF	2,700	2,800
MW-59-100	SA	12/13/2019	FD	--	2,700	2,700
MW-60-125	BR	05/02/2018		LF	510	470
MW-60-125	BR	12/06/2018		LF	980	950
MW-60-125	BR	05/22/2019		LF	880	890
MW-60-125	BR	12/06/2019		LF	580	540
MW-60BR-245	BR	02/21/2018		3V	69	59
MW-60BR-245	BR	05/02/2018		3V	73	67
MW-60BR-245	BR	09/25/2018		3V	76	81
MW-60BR-245	BR	12/06/2018		3V	110	120
MW-60BR-245	BR	02/14/2019		3V	110	110
MW-60BR-245	BR	05/22/2019		3V	130	120
MW-60BR-245	BR	12/12/2019		3V	64	52
MW-60BR-245_D	BR	02/21/2018		LF	4.1	39
MW-60BR-245_D	BR	05/02/2018		LF	1.2	1.7
MW-60BR-245_D	BR	09/25/2018		LF	6.4	6.2
MW-60BR-245_D	BR	12/06/2018		LF	20	21
MW-60BR-245_D	BR	02/14/2019		LF	18	17
MW-60BR-245_D	BR	05/23/2019		LF	68	61
MW-60BR-245_D	BR	12/13/2019		LF	75	61
MW-60BR-245_S	BR	02/21/2018		LF	ND (1.0)	7.7
MW-60BR-245_S	BR	05/02/2018		LF	1.1	1.5
MW-60BR-245_S	BR	09/25/2018		LF	ND (1.0)	ND (1.0)
MW-60BR-245_S	BR	12/06/2018		LF	17	17
MW-60BR-245_S	BR	02/14/2019		LF	25	29
MW-60BR-245_S	BR	05/23/2019		LF	85	74
MW-60BR-245_S	BR	12/13/2019		LF	86	76
MW-61-110	BR	05/04/2018		LF	330	340
MW-61-110	BR	12/13/2018		LF	430	460
MW-61-110	BR	12/13/2018	FD	--	460	470
MW-61-110	BR	05/23/2019		LF	280	280
MW-61-110	BR	12/06/2019		LF	480	460
MW-62-065	BR	02/19/2018		LF	560	510

Appendix E

Historical Cr(VI) and Dissolved Chromium Concentrations, January 2018 through December 2019

Fourth Quarter 2019 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 Type	Sample Method	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)
MW-62-065	BR	02/19/2018	FD	--	550	530
MW-62-065	BR	05/01/2018		LF	520	530
MW-62-065	BR	09/26/2018		LF	540	570
MW-62-065	BR	12/07/2018		LF	540	610
MW-62-065	BR	02/11/2019		LF	470	550
MW-62-065	BR	05/21/2019		LF	570	560
MW-62-065	BR	10/01/2019		LF	490	530
MW-62-065	BR	12/03/2019		LF	560	540
MW-62-110	BR	02/21/2018		Tap	ND (1.0)	ND (1.0)
MW-62-110	BR	05/03/2018		G	ND (1.0)	ND (1.0)
MW-62-110	BR	09/26/2018		3V	ND (1.0)	ND (1.0)
MW-62-110	BR	12/13/2018		G	0.32	3.0
MW-62-110	BR	02/14/2019		LF	ND (1.0)	ND (1.0)
MW-62-110	BR	05/22/2019		G	ND (1.0)	ND (1.0)
MW-62-110	BR	09/25/2019		G	ND (1.0)	ND (1.0)
MW-62-110	BR	12/04/2019		G	0.59	ND (1.0)
MW-62-190	BR	05/03/2018		G	ND (1.0)	ND (1.0)
MW-62-190	BR	12/13/2018		LF	ND (1.0)	ND (1.0)
MW-62-190	BR	05/22/2019		G	ND (1.0)	ND (1.0)
MW-62-190	BR	12/04/2019		LF	ND (1.0)	ND (1.0)
MW-63-065	BR	02/21/2018		LF	0.53	1.6
MW-63-065	BR	04/26/2018		LF	0.85	1.3
MW-63-065	BR	09/24/2018		LF	1.0	1.4
MW-63-065	BR	09/24/2018	FD	--	1.0	1.5
MW-63-065	BR	12/12/2018		LF	0.95	1.7
MW-63-065	BR	02/14/2019		LF	1.1	1.3
MW-63-065	BR	05/21/2019		LF	1.3	2.8
MW-63-065	BR	09/26/2019		LF	1.2	1.0
MW-63-065	BR	09/26/2019	FD	--	1.2	1.1
MW-63-065	BR	12/06/2019		LF	1.4	3.0
MW-64BR	BR	02/19/2018		LF	ND (1.0)	ND (1.0)
MW-64BR	BR	02/19/2018	FD	--	ND (1.0)	ND (1.0)
MW-64BR	BR	05/02/2018		LF	ND (1.0)	ND (1.0)
MW-64BR	BR	09/24/2018		LF	ND (1.0)	ND (1.0)
MW-64BR	BR	12/13/2018		LF	ND (1.0)	ND (1.0)
MW-64BR	BR	02/13/2019		LF	ND (1.0)	ND (1.0)
MW-64BR	BR	05/21/2019		LF	ND (1.0)	ND (1.0)
MW-64BR	BR	08/22/2019		LF	ND (1.0)	ND (1.0)
MW-64BR	BR	12/06/2019		LF	ND (1.0)	ND (1.0)
MW-65-160	SA	02/22/2018		LF	190	170
MW-65-160	SA	04/30/2018		LF	160	170
MW-65-160	SA	09/27/2018		LF	170	170
MW-65-160	SA	12/05/2018		LF	160	220
MW-65-160	SA	02/13/2019		LF	220	220
MW-65-160	SA	05/16/2019		LF	160	190

Appendix E

Historical Cr(VI) and Dissolved Chromium Concentrations, January 2018 through December 2019

Fourth Quarter 2019 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 Type	Sample Method	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)
MW-65-160	SA	09/26/2019		LF	150	160
MW-65-160	SA	12/03/2019		LF	260	260
MW-65-225	DA	02/22/2018		LF	510	520
MW-65-225	DA	04/30/2018		LF	110	100
MW-65-225	DA	09/27/2018		LF	180	170
MW-65-225	DA	09/27/2018	FD	--	180	170
MW-65-225	DA	12/05/2018		LF	220	220
MW-65-225	DA	02/13/2019		LF	490	490
MW-65-225	DA	05/16/2019		LF	180	160
MW-65-225	DA	09/26/2019		LF	330	340
MW-65-225	DA	09/26/2019	FD	--	330	320
MW-65-225	DA	12/03/2019		LF	480	450
MW-66-165	SA	04/30/2018		LF	540	540
MW-66-165	SA	12/05/2018		LF	480	500
MW-66-165	SA	05/16/2019		LF	550	570
MW-66-165	SA	05/16/2019	FD	--	540	580
MW-66-165	SA	12/03/2019		LF	480	480
MW-66-230	DA	04/30/2018		LF	6,700	6,900
MW-66-230	DA	04/30/2018	FD	--	6,800	6,900
MW-66-230	DA	12/05/2018		LF	6,100	6,200
MW-66-230	DA	05/16/2019		LF	6,400	7,000
MW-66-230	DA	12/03/2019		LF	6,800	6,600
MW-66BR-270	BR	05/02/2018		3V	ND (1.0)	ND (1.0)
MW-66BR-270	BR	12/07/2018		3V	ND (1.0)	ND (1.0)
MW-66BR-270	BR	05/22/2019		3V	ND (1.0)	ND (1.0)
MW-66BR-270	BR	12/10/2019		3V	ND (1.0)	ND (1.0)
MW-67-185	SA	04/30/2018		LF	1,800	1,700
MW-67-185	SA	12/05/2018		LF	1,800	2,000
MW-67-185	SA	05/16/2019		LF	2,100	2,200
MW-67-185	SA	12/04/2019		LF	3,100	2,900 J
MW-67-225	MA	04/30/2018		LF	2,800	2,800
MW-67-225	MA	12/05/2018		LF	2,900	3,000
MW-67-225	MA	05/16/2019		LF	3,100	3,300
MW-67-225	MA	12/04/2019		LF	3,300	3,300
MW-67-260	DA	04/30/2018		LF	820	830
MW-67-260	DA	12/05/2018		LF	660	710 J
MW-67-260	DA	05/16/2019		LF	800	850
MW-67-260	DA	12/04/2019		LF	390	360
MW-68-180	SA	02/22/2018		LF	24,000	24,000
MW-68-180	SA	05/01/2018		LF	5,600	6,100
MW-68-180	SA	09/27/2018		LF	8,500	8,900
MW-68-180	SA	12/07/2018		LF	22,000	24,000
MW-68-180	SA	02/13/2019		LF	37,000	42,000
MW-68-180	SA	05/22/2019		LF	5,400	6,200
MW-68-180	SA	09/26/2019		LF	9,700	11,000

Appendix E

Historical Cr(VI) and Dissolved Chromium Concentrations, January 2018 through December 2019

Fourth Quarter 2019 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 Type	Sample Method	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)
MW-68-180	SA	12/04/2019		LF	34,000	37,000
MW-68-240	DA	02/22/2018		LF	2,100	2,000
MW-68-240	DA	05/01/2018		LF	2,000	2,100
MW-68-240	DA	12/05/2018		LF	2,000	1,900
MW-68-240	DA	05/23/2019		LF	2,000	2,000
MW-68-240	DA	05/23/2019	FD	--	1,900	2,100
MW-68-240	DA	12/04/2019		LF	2,100	1,900
MW-68BR-280	BR	02/22/2018		LF	ND (1.0)	ND (1.0)
MW-68BR-280	BR	05/01/2018		LF	ND (1.0)	ND (5.0)
MW-68BR-280	BR	12/05/2018		LF	ND (1.0)	ND (1.0)
MW-68BR-280	BR	05/22/2019		3V	ND (1.0)	ND (1.0)
MW-68BR-280	BR	12/04/2019		LF	ND (1.0)	ND (1.0)
MW-69-195	BR	02/22/2018		LF	120	110
MW-69-195	BR	05/01/2018		LF	210	210
MW-69-195	BR	09/27/2018		LF	460	450
MW-69-195	BR	12/07/2018		LF	460	470
MW-69-195	BR	02/13/2019		LF	110	100
MW-69-195	BR	05/16/2019		LF	120	120
MW-69-195	BR	09/26/2019		LF	78	77
MW-69-195	BR	12/03/2019		LF	180	150
MW-70-105	BR	05/03/2018		LF	160	150
MW-70-105	BR	12/13/2018		LF	120	130
MW-70-105	BR	05/21/2019		LF	170	170
MW-70-105	BR	12/17/2019		LF	60	55
MW-70BR-225	BR	05/03/2018		3V	1,800	1,800
MW-70BR-225	BR	05/03/2018		LF	1,300	1,300
MW-70BR-225	BR	12/13/2018		3V	1,800	1,900
MW-70BR-225	BR	12/13/2018		LF	1,200	1,400
MW-70BR-225	BR	05/21/2019		LF	1,600	1,700
MW-70BR-225	BR	12/17/2019		LF	1,300	1,200
MW-71-035	SA	05/02/2018		LF	ND (1.0)	ND (1.0)
MW-71-035	SA	12/11/2018		LF	ND (1.0)	ND (1.0)
MW-71-035	SA	12/11/2018	FD	--	ND (1.0)	1.0
MW-71-035	SA	05/23/2019		LF	ND (1.0)	ND (1.0)
MW-71-035	SA	12/18/2019		LF	ND (1.0)	ND (1.0)
MW-72-080	BR	02/20/2018		LF	90	78
MW-72-080	BR	04/26/2018		LF	68	62
MW-72-080	BR	09/26/2018		LF	91	100
MW-72-080	BR	12/06/2018		LF	82	73
MW-72-080	BR	02/11/2019		LF	77	92
MW-72-080	BR	05/24/2019		LF	55	51
MW-72-080	BR	08/22/2019		LF	93	91
MW-72-080	BR	12/06/2019		LF	120	110
MW-72BR-200	BR	02/20/2018		3V	4.5	4.4
MW-72BR-200	BR	04/26/2018		3V	3.3	2.6

Appendix E

Historical Cr(VI) and Dissolved Chromium Concentrations, January 2018 through December 2019

Fourth Quarter 2019 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 Type	Sample Method	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)
MW-72BR-200	BR	09/26/2018		3V	3.0	2.9
MW-72BR-200	BR	12/06/2018		3V	4.9	3.3
MW-72BR-200	BR	02/12/2019		3V	5.3	5.4
MW-72BR-200	BR	08/22/2019		LF	ND (1.0)	ND (1.0)
MW-72BR-200	BR	12/06/2019		LF	2.4	3.5
MW-72BR-200_D	BR	02/20/2018		LF	1.6	2.1
MW-72BR-200_D	BR	04/26/2018		LF	ND (1.0)	ND (1.0)
MW-72BR-200_D	BR	09/26/2018		LF	ND (1.0)	ND (1.0)
MW-72BR-200_D	BR	12/06/2018		LF	ND (1.0)	ND (1.0)
MW-72BR-200_D	BR	02/12/2019		LF	ND (1.0)	ND (1.0)
MW-72BR-200_S	BR	02/20/2018		LF	ND (1.0)	1.1
MW-72BR-200_S	BR	04/26/2018		LF	ND (1.0)	2.0
MW-72BR-200_S	BR	09/26/2018		LF	ND (1.0)	ND (1.0)
MW-72BR-200_S	BR	12/06/2018		LF	ND (1.0)	ND (1.0)
MW-72BR-200_S	BR	02/12/2019		LF	ND (1.0)	1.3
MW-72BR-200_S	BR	05/23/2019		LF	ND (1.0)	ND (1.0)
MW-73-080	BR	02/20/2018		LF	22	21
MW-73-080	BR	05/01/2018		LF	57	58
MW-73-080	BR	09/24/2018		LF	36	39
MW-73-080	BR	12/06/2018		LF	29	26
MW-73-080	BR	02/11/2019		LF	29	34 J
MW-73-080	BR	05/23/2019		LF	34	35
MW-73-080	BR	08/22/2019		LF	20	18
MW-73-080	BR	12/06/2019		LF	19	19
MW-74-240	BR	05/02/2018		LF	0.46	ND (1.0)
MW-74-240	BR	12/07/2018		LF	0.33	ND (1.0)
MW-74-240	BR	05/22/2019		LF	0.55	ND (1.0)
MW-74-240	BR	12/05/2019		LF	ND (0.2)	ND (1.0)
PE-01	DA	01/04/2018		Tap	ND (0.2)	ND (1.0)
PE-01	DA	02/07/2018		Tap	0.7	ND (1.0)
PE-01	DA	03/07/2018		Tap	2.3	2.0
PE-01	DA	04/03/2018		Tap	ND (0.2)	ND (1.0)
PE-01	DA	05/04/2018		Tap	ND (0.2)	1.8
PE-01	DA	06/07/2018		Tap	ND (0.2)	ND (1.0)
PE-01	DA	07/03/2018		Tap	ND (0.2)	ND (1.0)
PE-01	DA	08/01/2018		Tap	ND (0.2)	ND (1.0)
PE-01	DA	09/06/2018		Tap	ND (0.2)	ND (1.0)
PE-01	DA	10/02/2018		Tap	7.6	5.6
PE-01	DA	11/07/2018		Tap	ND (0.2)	ND (1.0)
PE-01	DA	12/04/2018		Tap	0.68	2.9
PE-01	DA	01/03/2019		Tap	ND (0.2)	ND (1.0)
PE-01	DA	02/14/2019		Tap	ND (0.2)	ND (1.0)
PE-01	DA	03/05/2019		Tap	ND (0.2)	ND (1.0)
PE-01	DA	04/23/2019		Tap	ND (0.2)	ND (1.0)
PE-01	DA	05/09/2019		Tap	ND (0.2)	ND (1.0)

Appendix E

Historical Cr(VI) and Dissolved Chromium Concentrations, January 2018 through December 2019

Fourth Quarter 2019 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 Type	Sample Method	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)
PE-01	DA	06/05/2019		Tap	ND (0.2)	ND (1.0)
PE-01	DA	07/24/2019		Tap	ND (0.2)	ND (1.0)
PE-01	DA	08/22/2019		Tap	ND (0.2)	ND (1.0)
PE-01	DA	09/04/2019		Tap	0.69	ND (1.0)
PE-01	DA	10/03/2019		Tap	ND (0.2)	ND (1.0)
PE-01	DA	11/07/2019		Tap	ND (0.2)	ND (1.0)
PE-01	DA	12/04/2019		Tap	ND (0.2)	ND (1.0)
TW-01	SA	05/01/2018		3V	2,400	3,100
TW-01	SA	12/05/2018		3V	2,100	2,100
TW-01	SA	05/24/2019		LF	2,300	2,400
TW-01	SA	12/03/2019		LF	2,200	2,100
TW-02D	DA	02/23/2018		LF	140	140
TW-02D	DA	02/23/2018	FD	--	150	140
TW-02D	DA	05/04/2018		Tap	150	150
TW-02D	DA	05/04/2018	FD	--	150	140
TW-02D	DA	09/26/2018		Tap	ND (0.2)	ND (1.0)
TW-02D	DA	09/26/2018	FD	--	ND (0.2)	ND (1.0)
TW-02D	DA	12/04/2018		Tap	140	110
TW-02D	DA	02/14/2019		Tap	120	140
TW-02D	DA	02/14/2019	FD	--	120	130
TW-02D	DA	04/23/2019		Tap	93	46
TW-02D	DA	10/03/2019		Tap	95	110
TW-02D	DA	12/04/2019		Tap	2.3	52
TW-03D	DA	01/04/2018		Tap	550	590
TW-03D	DA	02/07/2018		Tap	550	540
TW-03D	DA	03/07/2018		Tap	530	520
TW-03D	DA	04/03/2018		Tap	570	550
TW-03D	DA	05/04/2018		Tap	490	490
TW-03D	DA	06/07/2018		Tap	470	480
TW-03D	DA	07/03/2018		Tap	480	500
TW-03D	DA	08/01/2018		Tap	480	480
TW-03D	DA	09/06/2018		Tap	500	510
TW-03D	DA	10/02/2018		Tap	480	500
TW-03D	DA	11/07/2018		Tap	490	510
TW-03D	DA	12/04/2018		Tap	480	490
TW-03D	DA	01/03/2019		Tap	500	480
TW-03D	DA	02/14/2019		Tap	420	520
TW-03D	DA	03/05/2019		Tap	500	520
TW-03D	DA	04/23/2019		Tap	470	480
TW-03D	DA	05/09/2019		Tap	460	440
TW-03D	DA	06/05/2019		Tap	450	440
TW-03D	DA	07/24/2019		Tap	450	430
TW-03D	DA	08/22/2019		Tap	410	430
TW-03D	DA	09/04/2019		Tap	500	450
TW-03D	DA	10/03/2019		Tap	410	430

Appendix E

Historical Cr(VI) and Dissolved Chromium Concentrations, January 2018 through December 2019

Fourth Quarter 2019 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 Type	Sample Method	Hexavalent Chromium (µg/L)	Dissolved Chromium (µg/L)
TW-03D	DA	11/07/2019		Tap	440	430
TW-03D	DA	12/04/2019		Tap	480	480
TW-04	DA	04/26/2018		3V	8.9	9.4
TW-04	DA	04/26/2018		LF	ND (1.0)	ND (5.0)
TW-04	DA	12/11/2018		3V	8.2	8.1
TW-04	DA	12/11/2018		LF	4.2	5.0
TW-04	DA	12/11/2018	FD	--	8.4	8.1
TW-04	DA	05/16/2019		LF	5.1	4.5
TW-04	DA	12/12/2019		LF	5.8	5.6
TW-05	DA	05/01/2018		3V	11	11
TW-05	DA	05/01/2018		LF	8.8	9.1
TW-05	DA	12/04/2018		3V	14	14
TW-05	DA	12/04/2018		LF	9.5	9.3
TW-05	DA	05/20/2019		LF	11	9.9
TW-05	DA	05/20/2019	FD	--	11	9.6
TW-05	DA	12/12/2019		LF	18	17

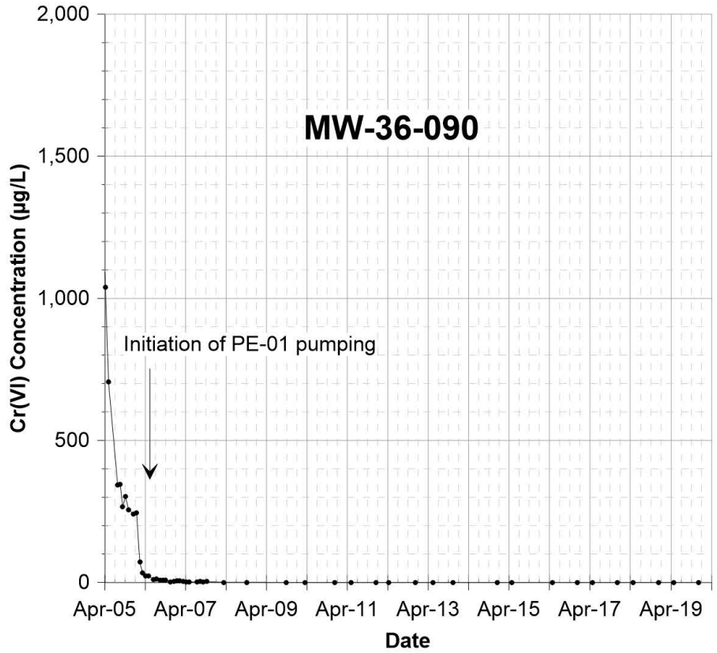
Notes:

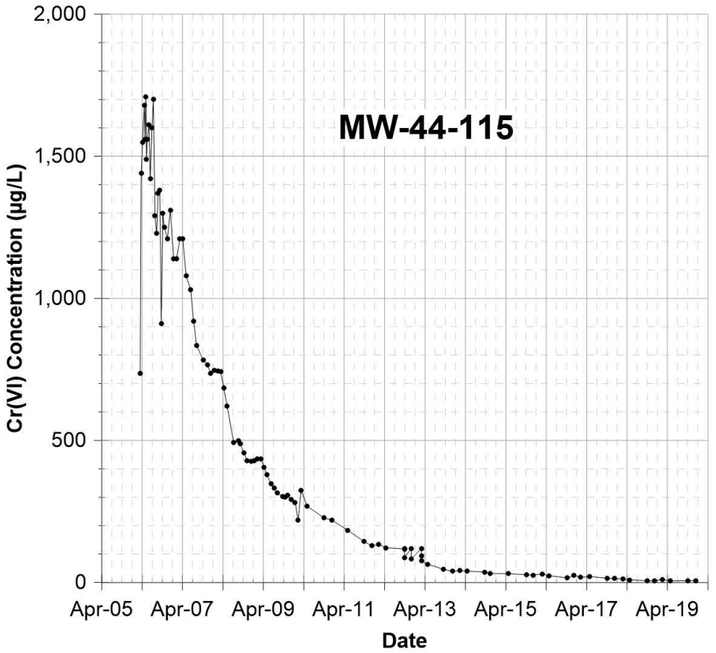
(a) = data were analyzed by an Arizona certified laboratory. p pp g aly SW7199 to E218.6.

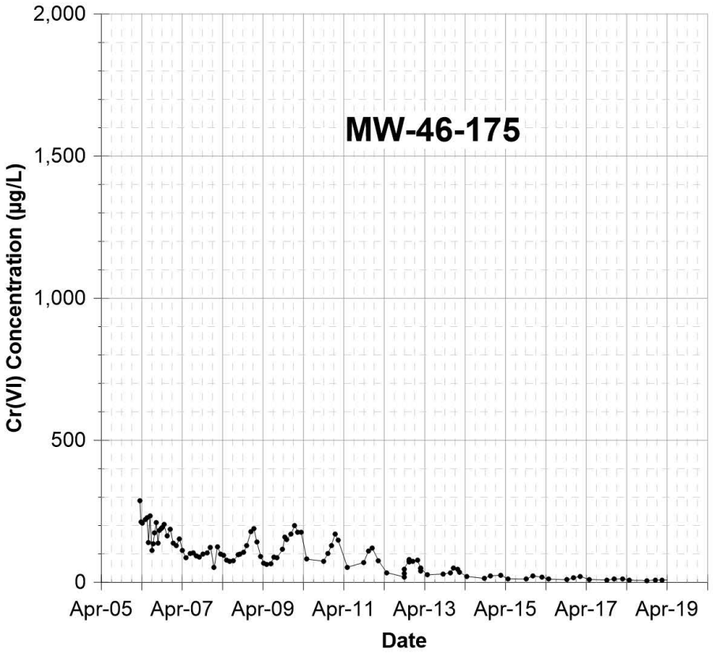
-- = not applicable.
µg/L = micrograms per liter.
3V = three volume.
BR = bedrock.
DA = deep interval of Alluvial Aquifer.
DTSC = Department of Toxic Substance Control.
FD = field duplicate.
G = Grab sample.
H = HydraSleeve.
ID = identification.
J = concentration or reporting limit (RL) estimated by laboratory or data validation.
LF = Low Flow (minimal drawdown).
MA = mid-depth interval of Alluvial Aquifer.
ND = not detected at listed reporting limit.
SA = shallow interval of Alluvial Aquifer.
Tap = sampled from tap of extraction well.

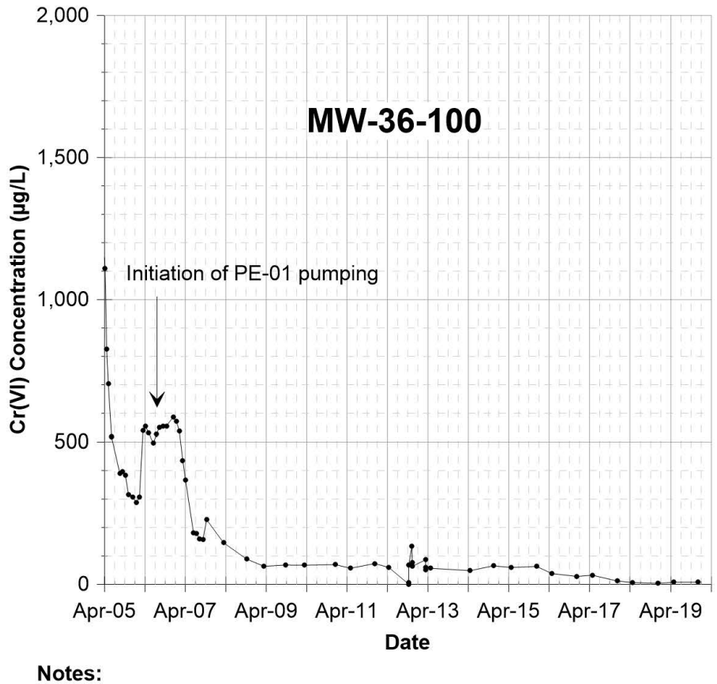
APPENDIX F

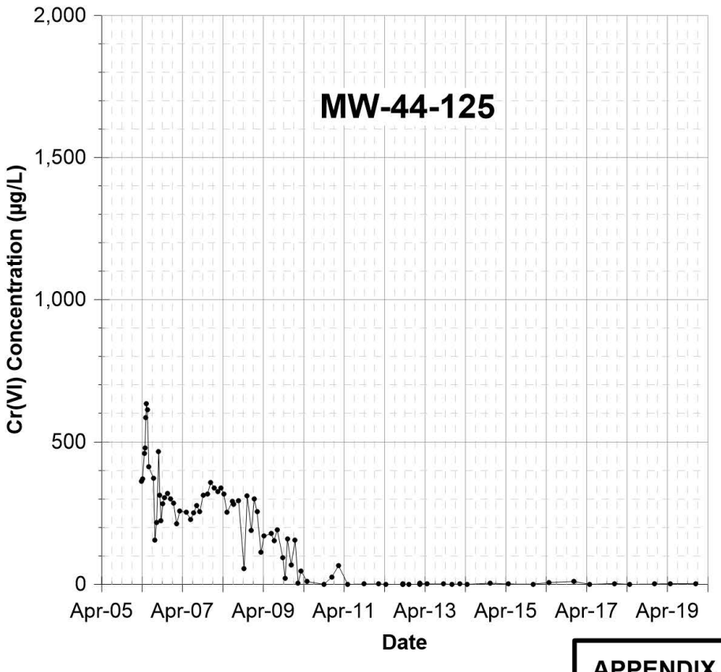
Concentration Time Series Charts, Fourth Quarter 2019

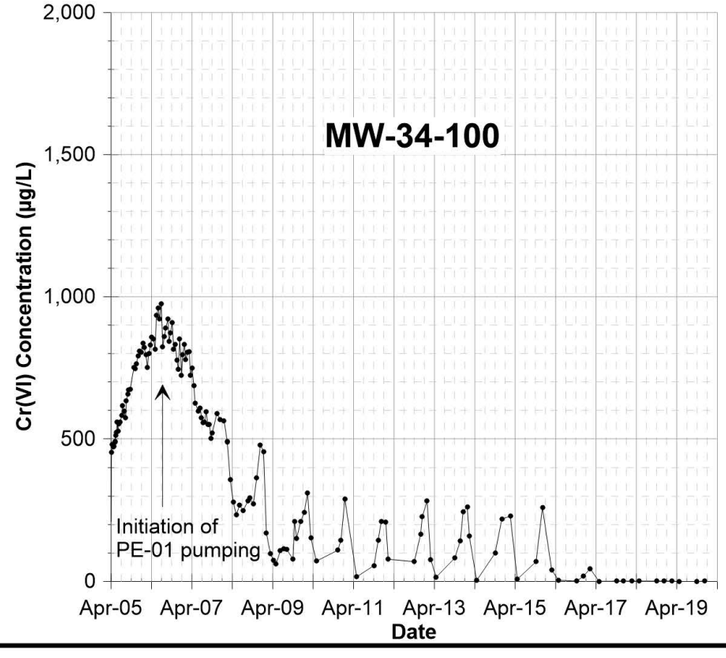












Notes:

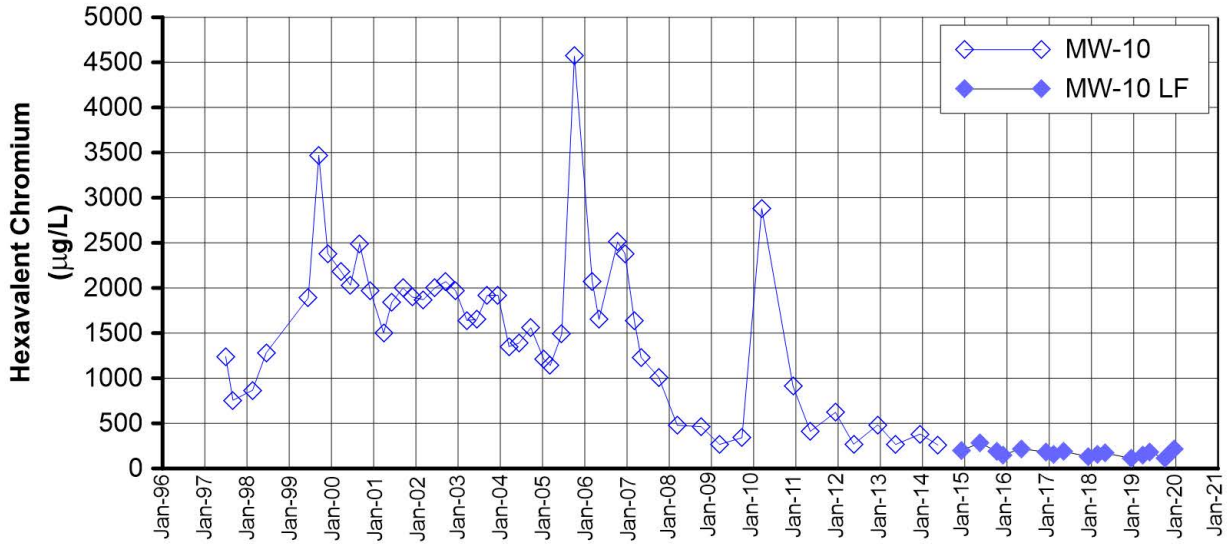
1. Hexavalent chromium [Cr(VI)] results in micrograms per liter (µg/L), equivalent to parts per billion (ppb).
2. Results plotted are maximum concentrations from primary and duplicate samples; see Table 3-1 for complete results.
3. MW-36 wells selected to monitor effects of PE-01 pumping on plume west of PE-01. MW-44 wells, MW-46-175, and MW-34-100 selected to monitor concentrations within the plume.

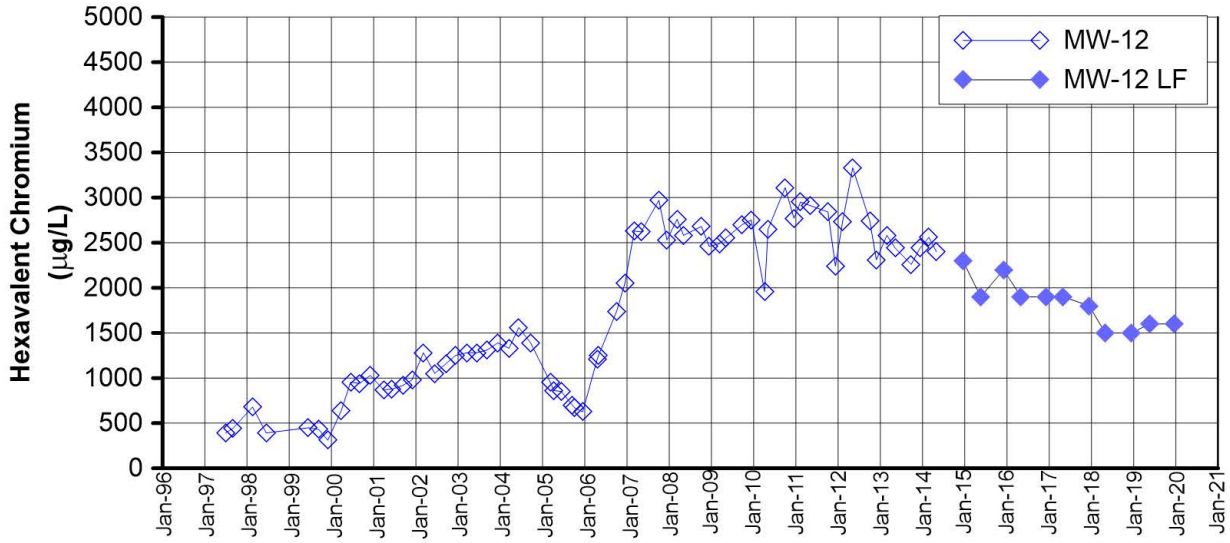
APPENDIX F
Cr(VI) CONCENTRATION TRENDS IN SELECTED PERFORMANCE MONITORING WELLS, APRIL 2005 THROUGH DECEMBER 2019

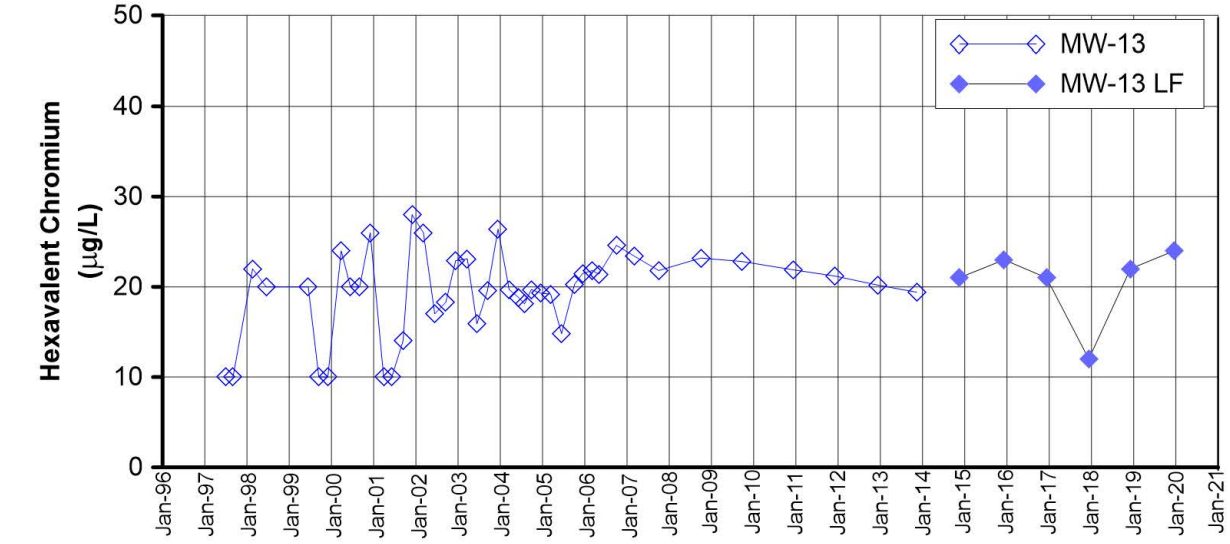
FOURTH QUARTER 2019 INTERIM MEASURES PERFORMANCE MONITORING
AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS

\\arcadis-us.com\officedata\Denver-CO-Technical\AProject\PG&E - Groundwater Monitoring\Reporting\00_Arcadis_rpts\02_GMP_rpts\17_Q419





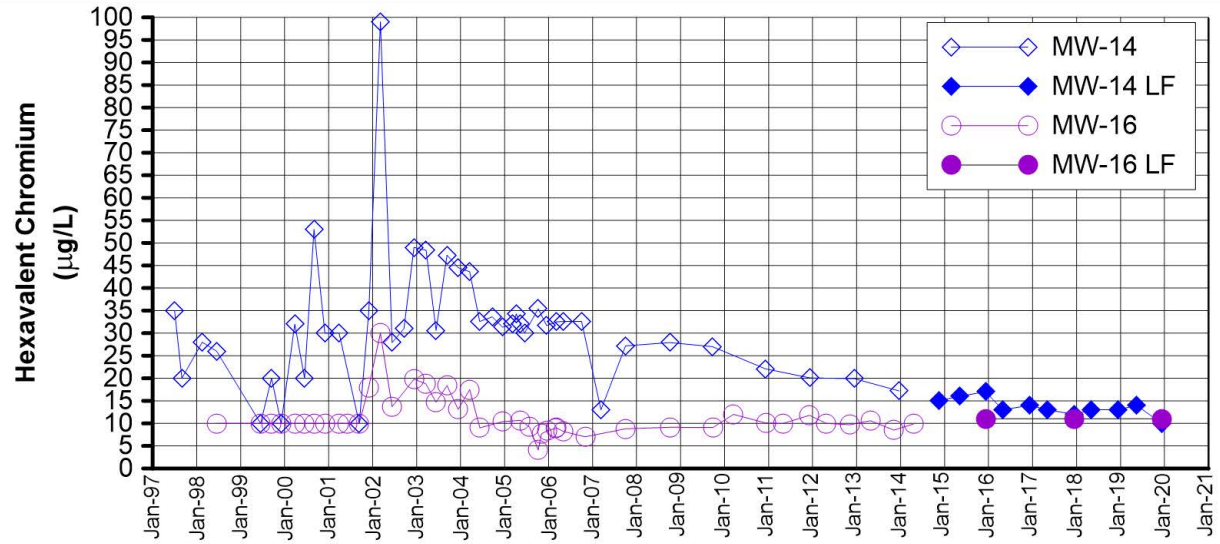


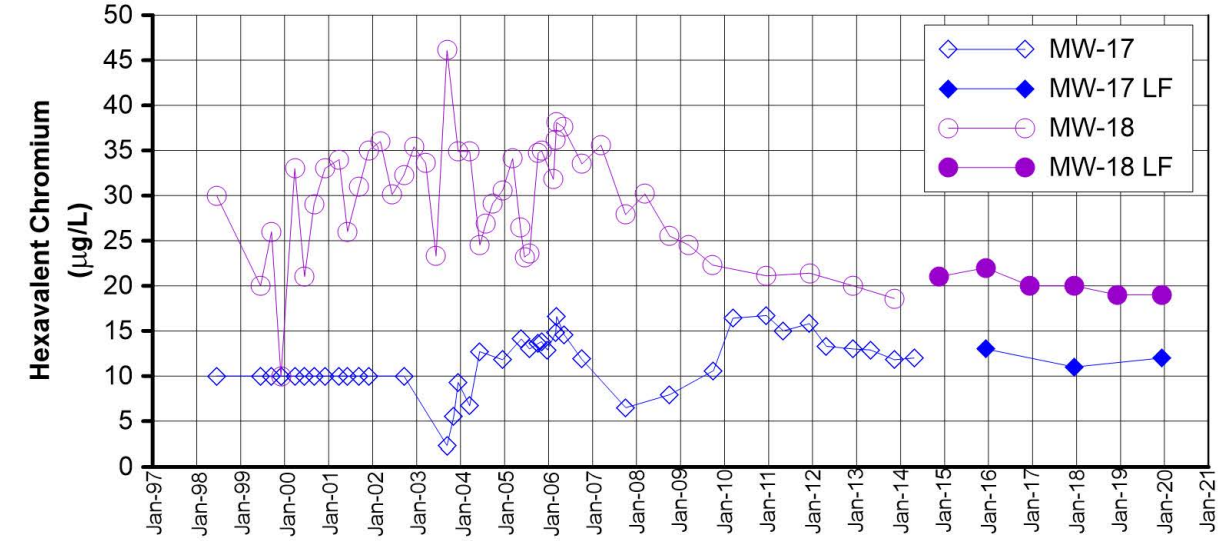
Notes:

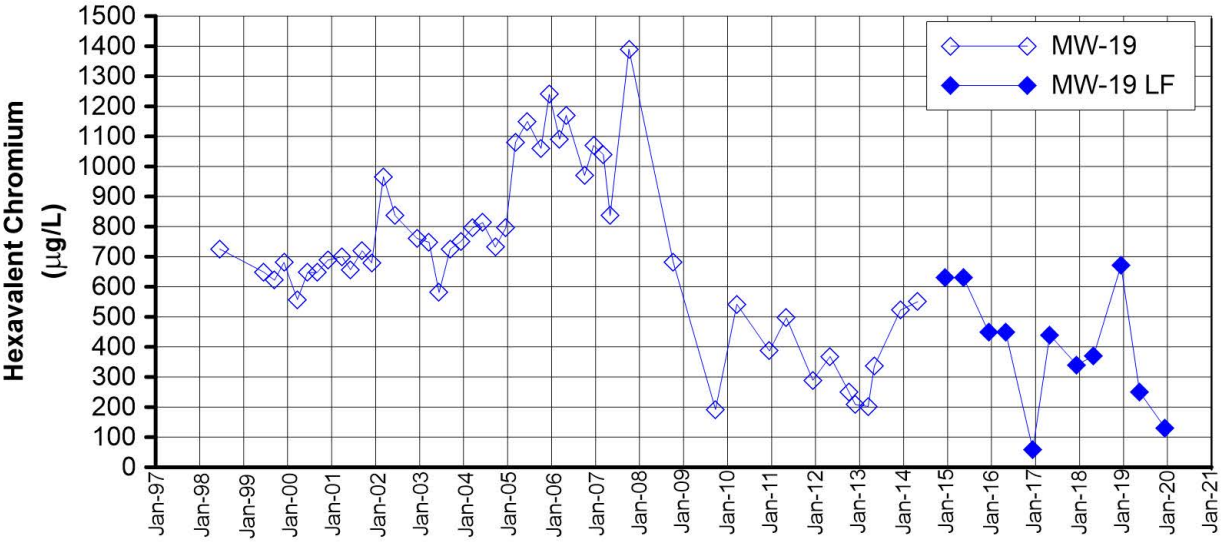
LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

FIGURE F-1
HEXAVALENT CHROMIUM
IN MW-10, MW-12, AND MW-13
FOURTH QUARTER 2019 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS







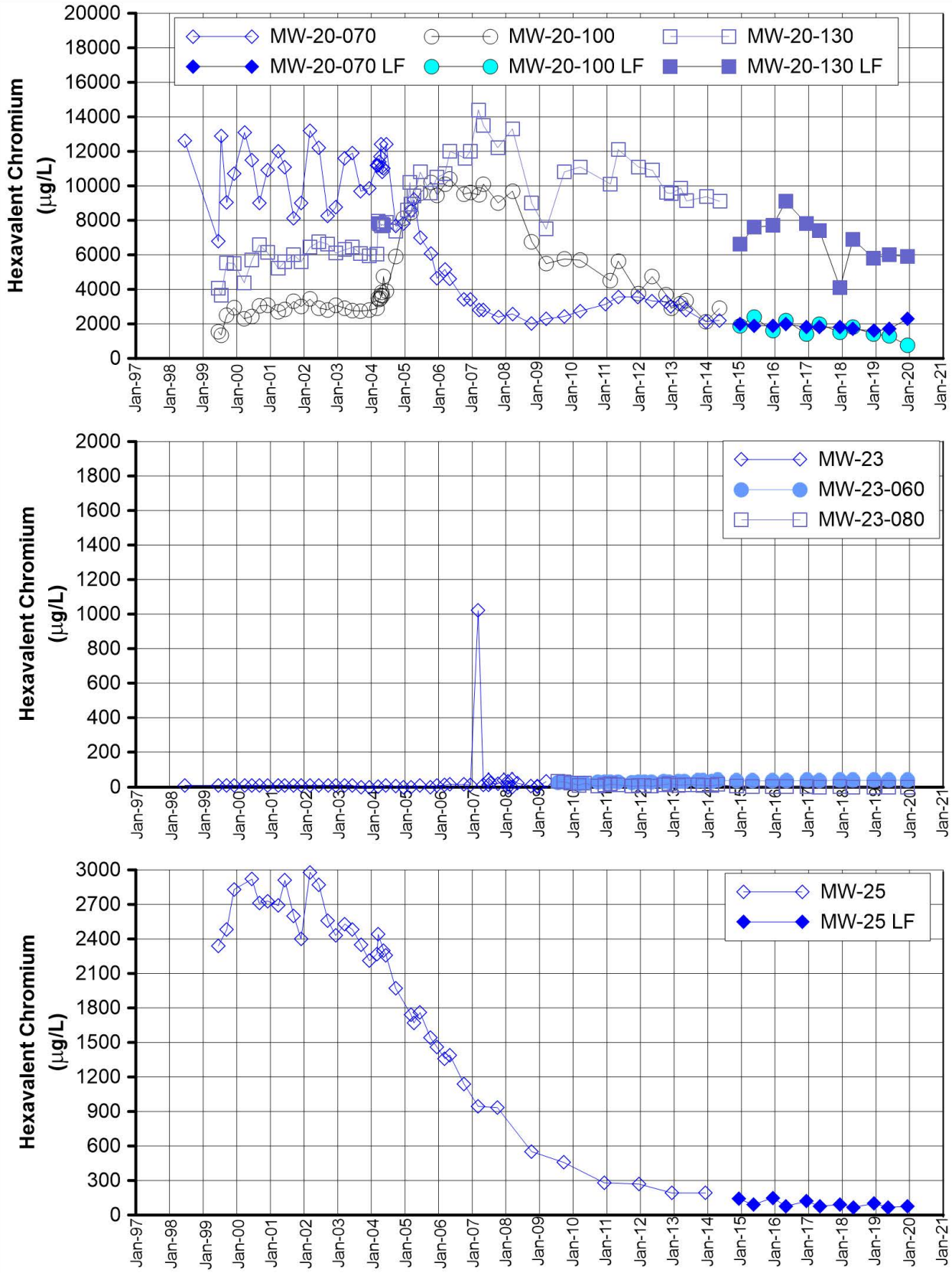
Notes:

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 F-2
HEXAVALENT CHROMIUM
IN MW-14, MW-16, MW-17, MW-18, AND MW-19
FOURTH QUARTER 2019 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\17_Q419



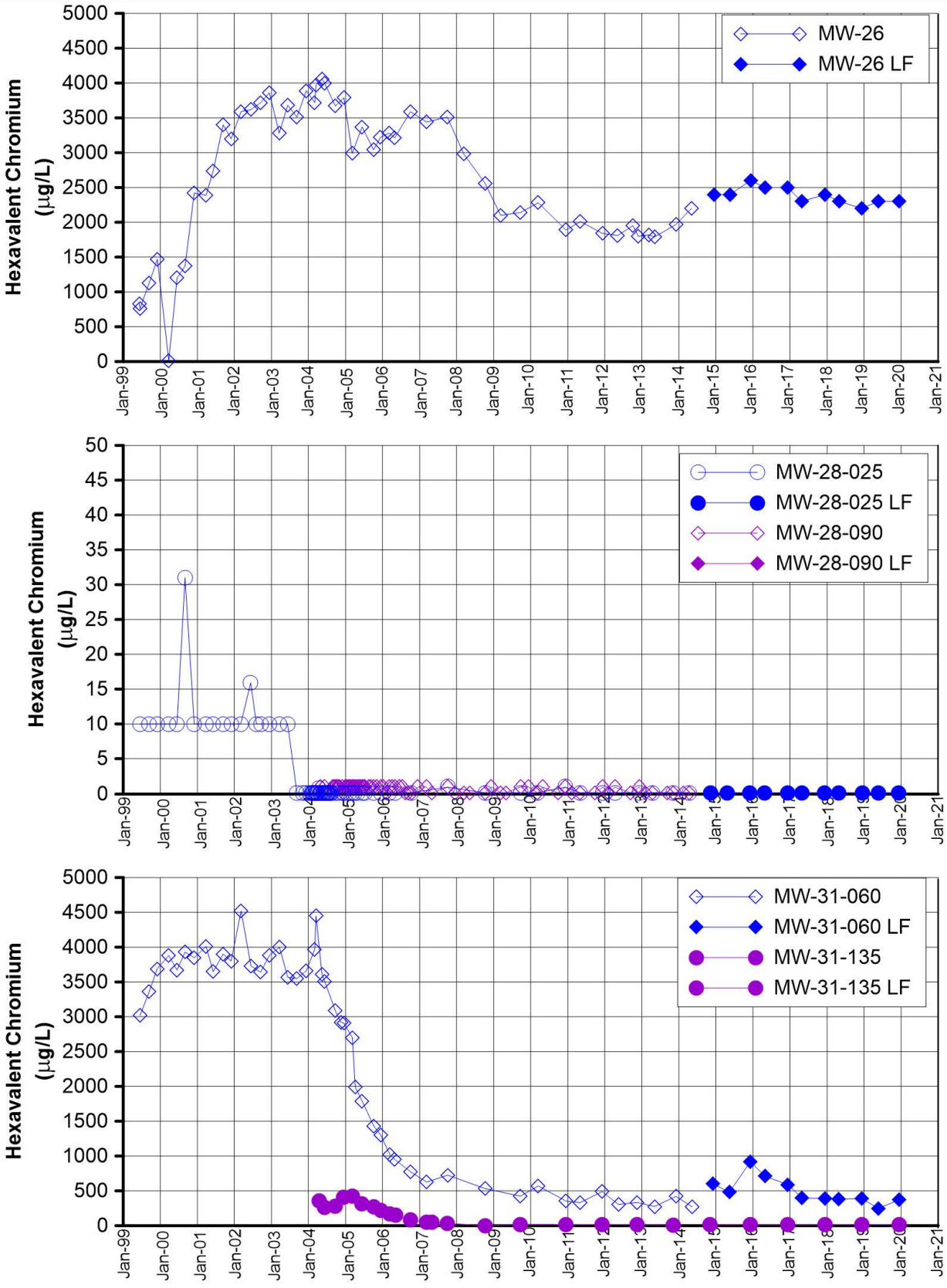
Notes:

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 F-3
HEXAVALENT CHROMIUM
IN MW-20 AND MW-23 CLUSTERS AND MW-25
FOURTH QUARTER 2019 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\17_Q419



Notes:

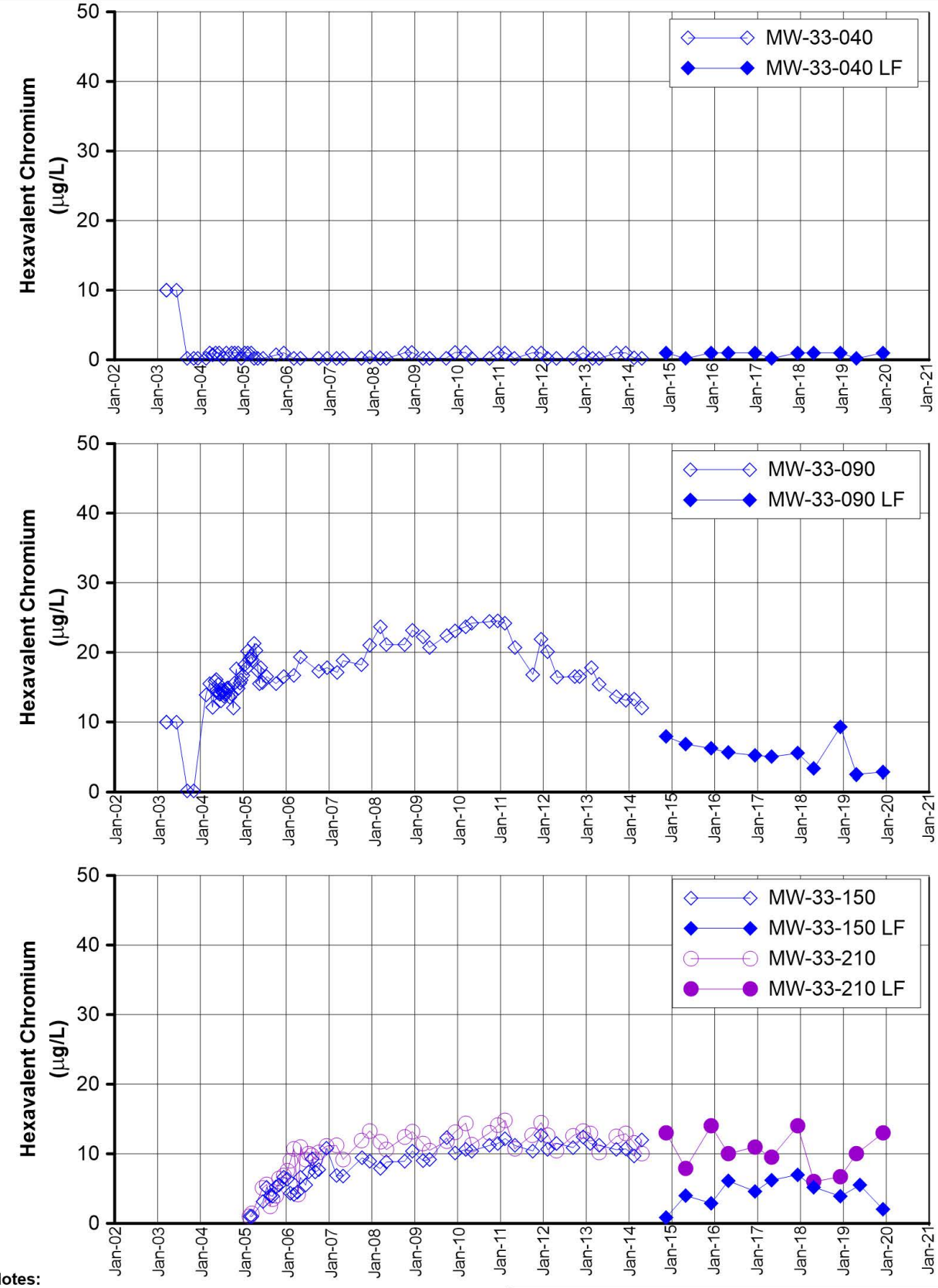
1) The IM Contingency Plan and hexavalent chromium [Cr(VI)] trigger levels were updated July 17, 2008 (DTSC, 2008b).
2) The trigger level for MW-28-090 is 20 µg/L.

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 F-4
HEXAVALENT CHROMIUM
IN MW-26, MW-28, AND MW-31 CLUSTERS
FOURTH QUARTER 2019 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\17_Q419



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.

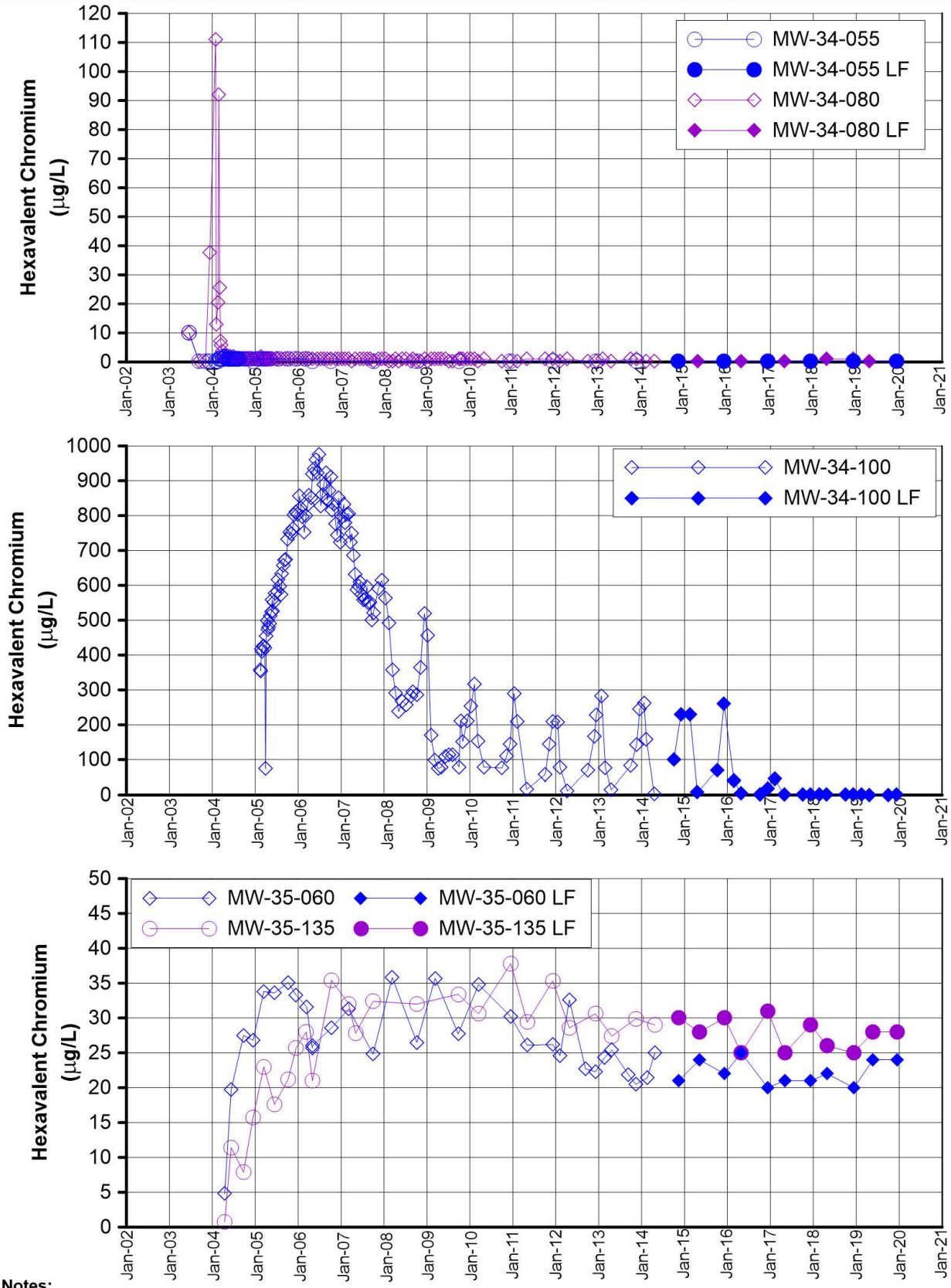
LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

FIGURE F-5
HEXAVALENT CHROMIUM IN MW-33 CLUSTER

FOURTH QUARTER 2019 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\17_Q419



Notes:

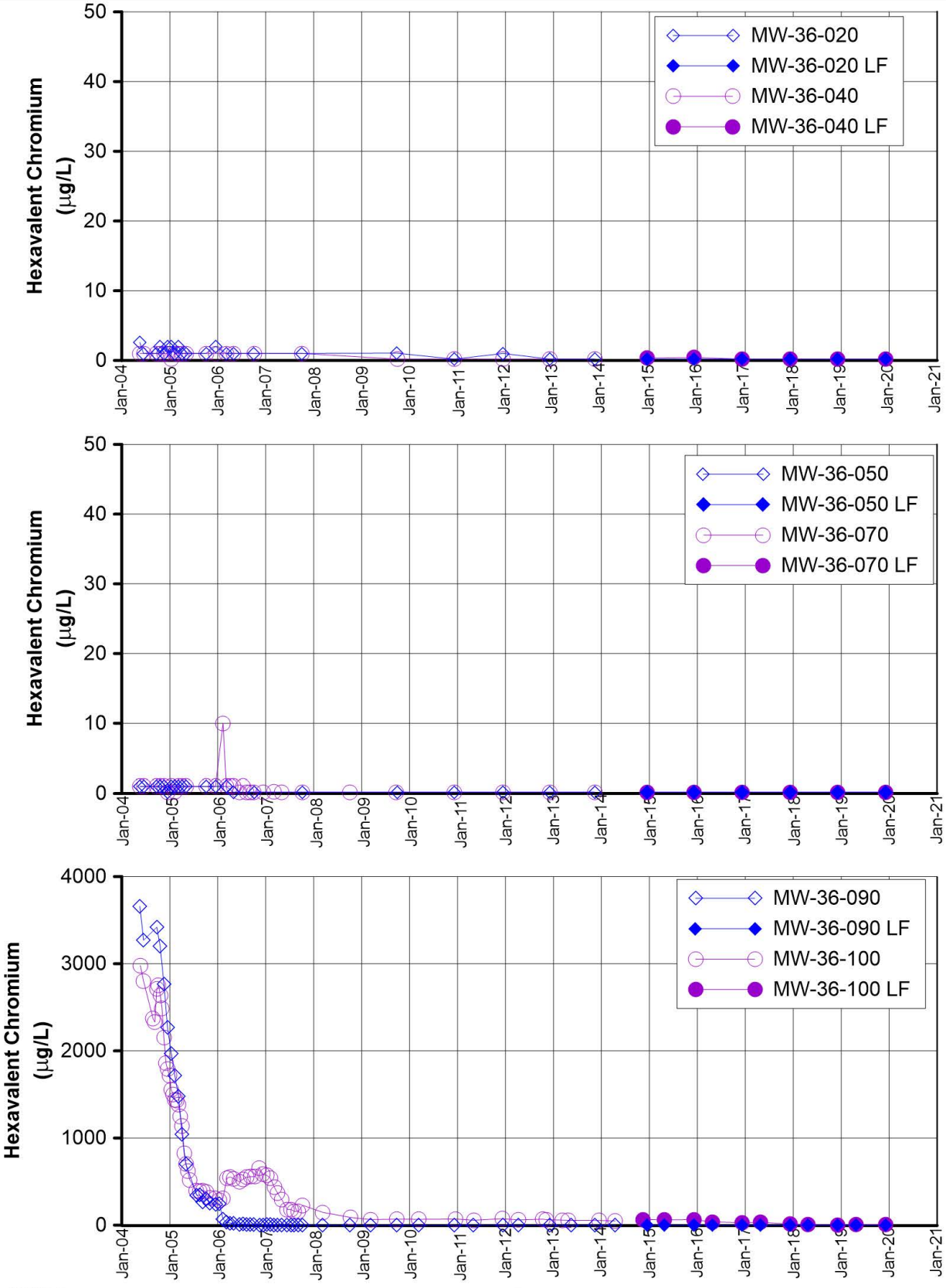
1) The IM Contingency Plan and hexavalent chromium [Cr(VI)] trigger levels were updated July 17, 2008 (DTSC, 2008b).
2) The trigger level for MW-34-080 is 20 µg/L.
3) The trigger level for MW-34-100 is 750 µg/L.

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 F-6
HEXAVALENT CHROMIUM
IN MW-34 AND MW-35 CLUSTERS
FOURTH QUARTER 2019 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\17_Q419



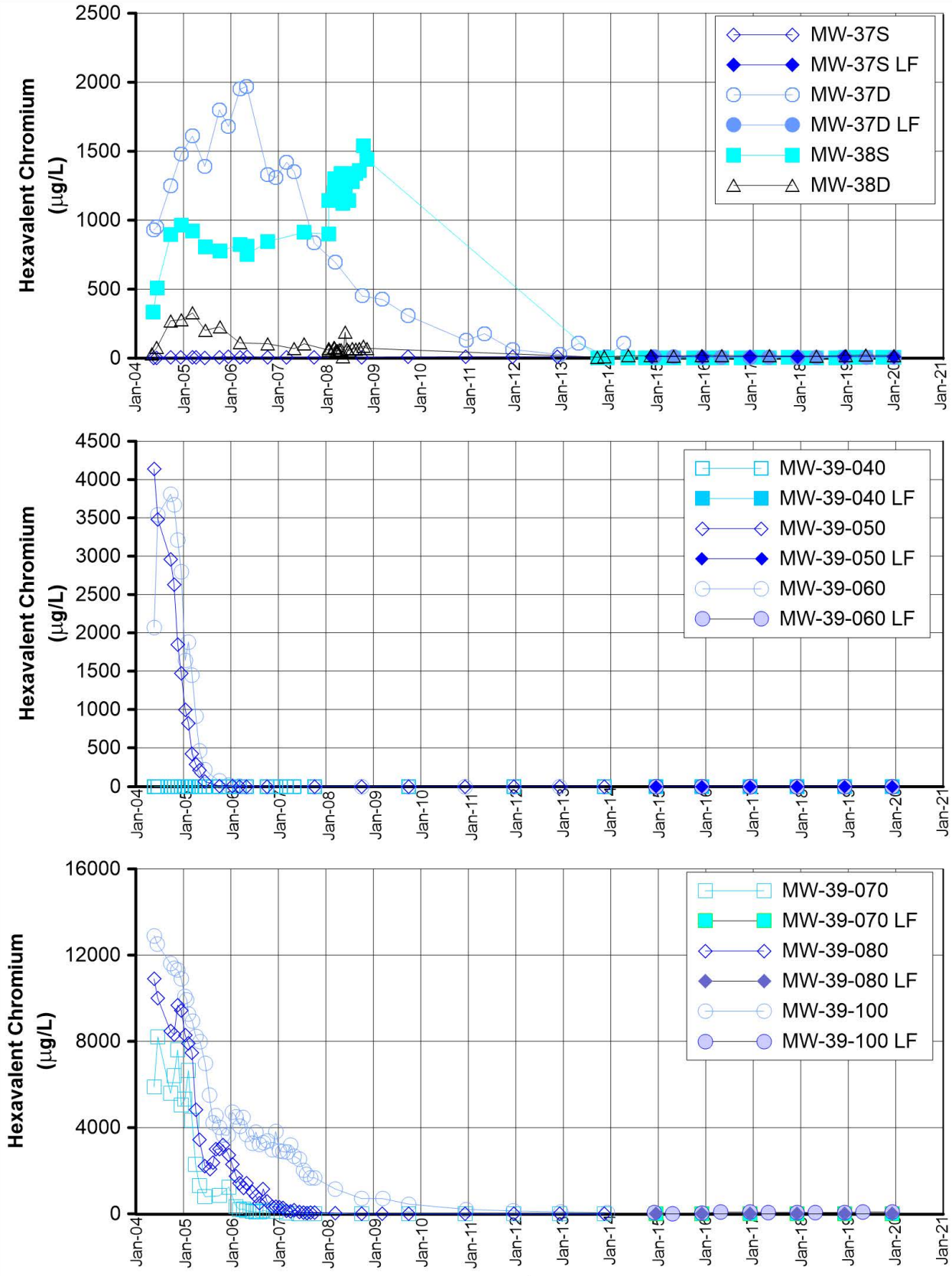
Notes:
1) The IM Contingency Plan and hexavalent chromium [Cr(VI)] trigger levels were updated July 17, 2008 (DTSC, 2008b).
2) The trigger level for MW-36-070 is 20 µg/L.

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 F-7
HEXAVALENT CHROMIUM IN MW-36 CLUSTER
FOURTH QUARTER 2019 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\17_Q419



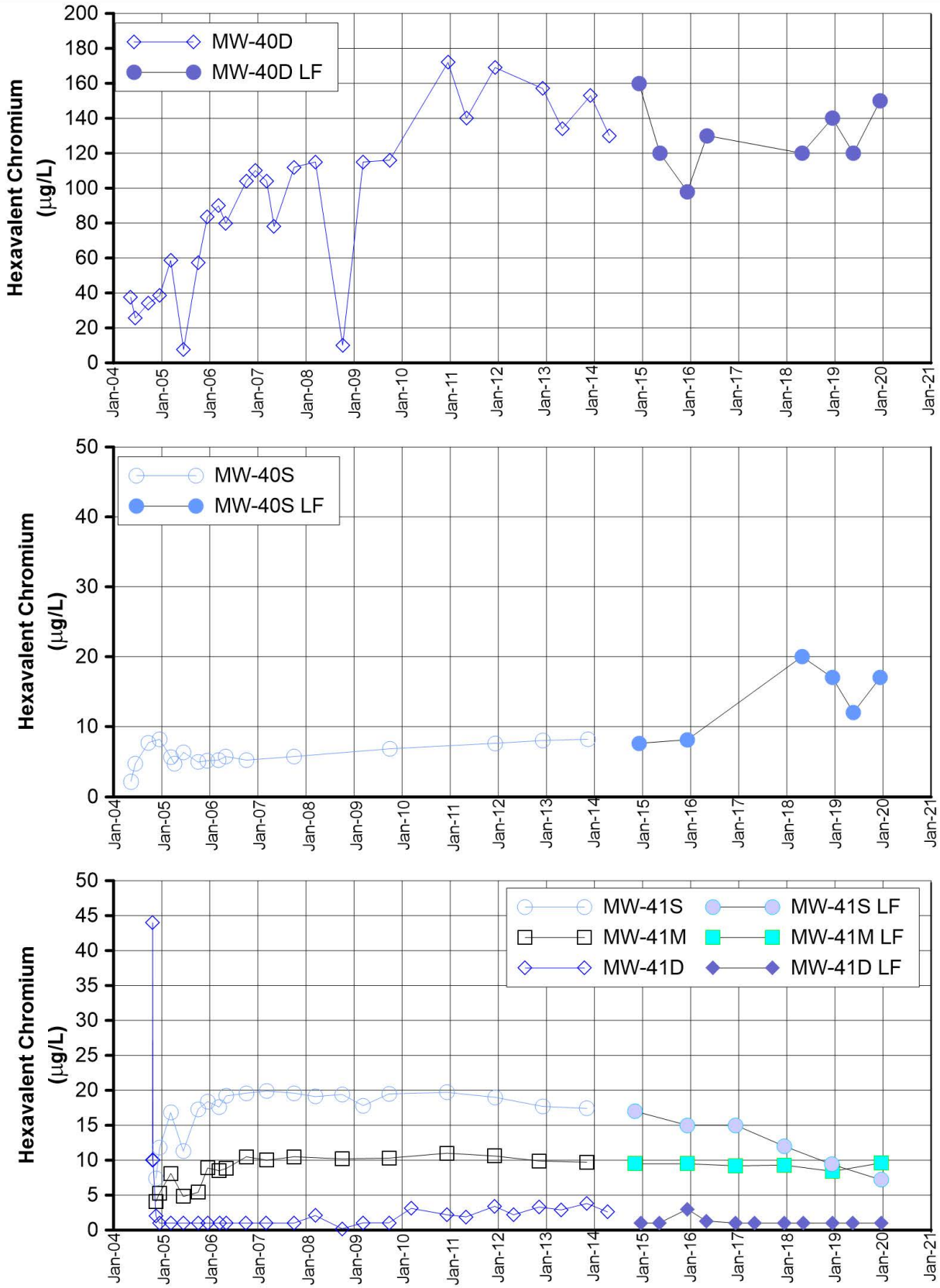
Notes:
1) The IM Contingency Plan and hexavalent chromium [Cr(VI)] trigger levels were updated July 17, 2008 (DTSC, 2008b).
2) The trigger level for MW-39-040 is 20 µg/L.

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 F-8
HEXAVALENT CHROMIUM
IN MW-37, MW-38 AND MW-39 CLUSTERS
FOURTH QUARTER 2019 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\17_Q419

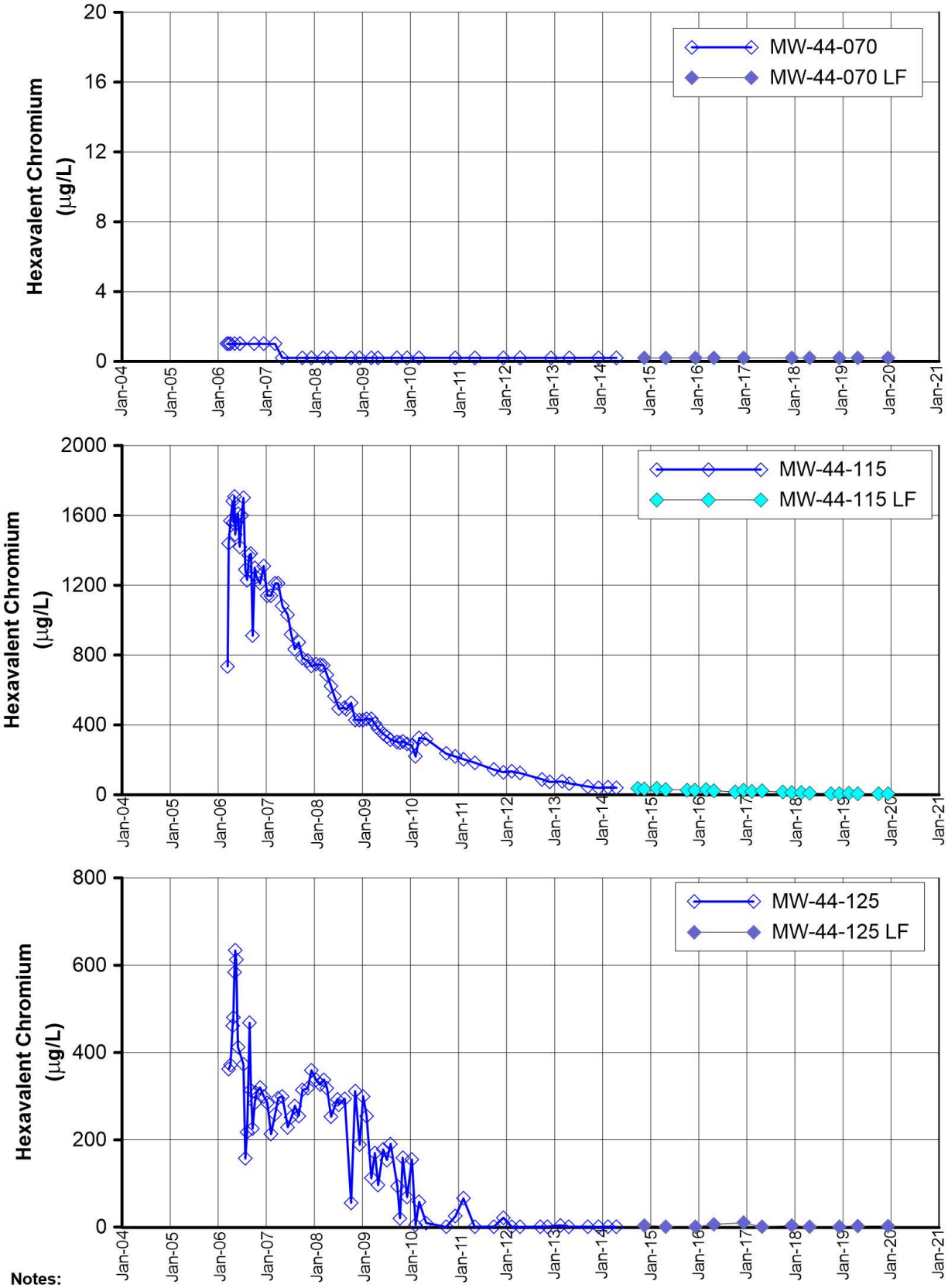


Notes:

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 F-9
HEXAVALENT CHROMIUM
IN MW-40 AND MW-41 CLUSTERS
FOURTH QUARTER 2019 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS



Notes:

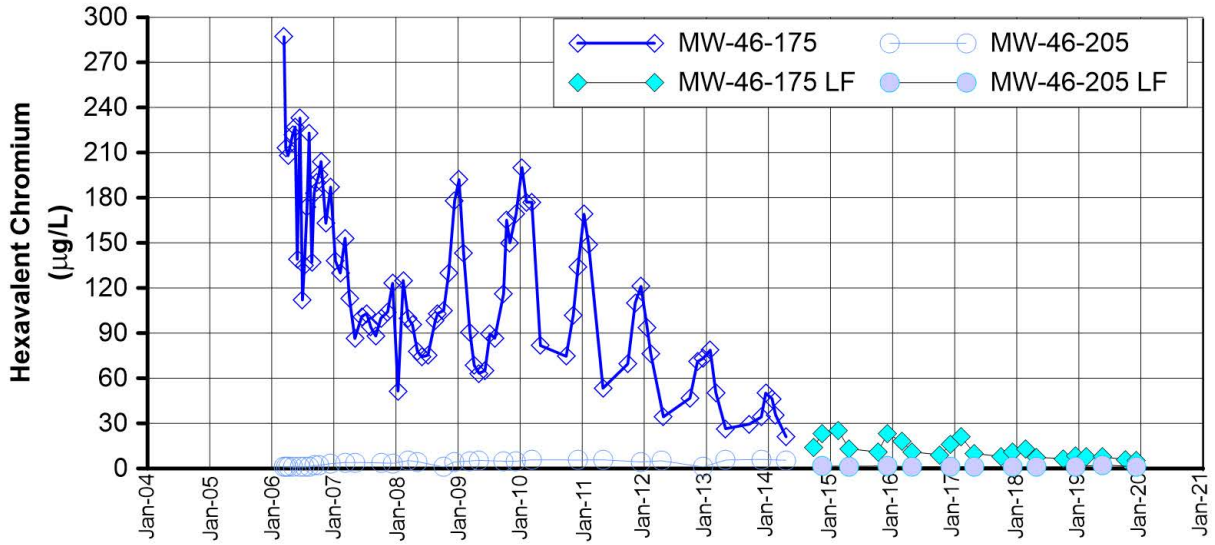
1) The IM Contingency Plan and hexavalent chromium [Cr(VI)] trigger levels were updated July 17, 2008 (DTSC, 2008b).
2) The trigger level for MW-44-070 is 20 µg/L.
3) The trigger level for MW-44-115 is 1,200 µg/L.
4) The trigger level for MW-44-125 is 475 µg/L.

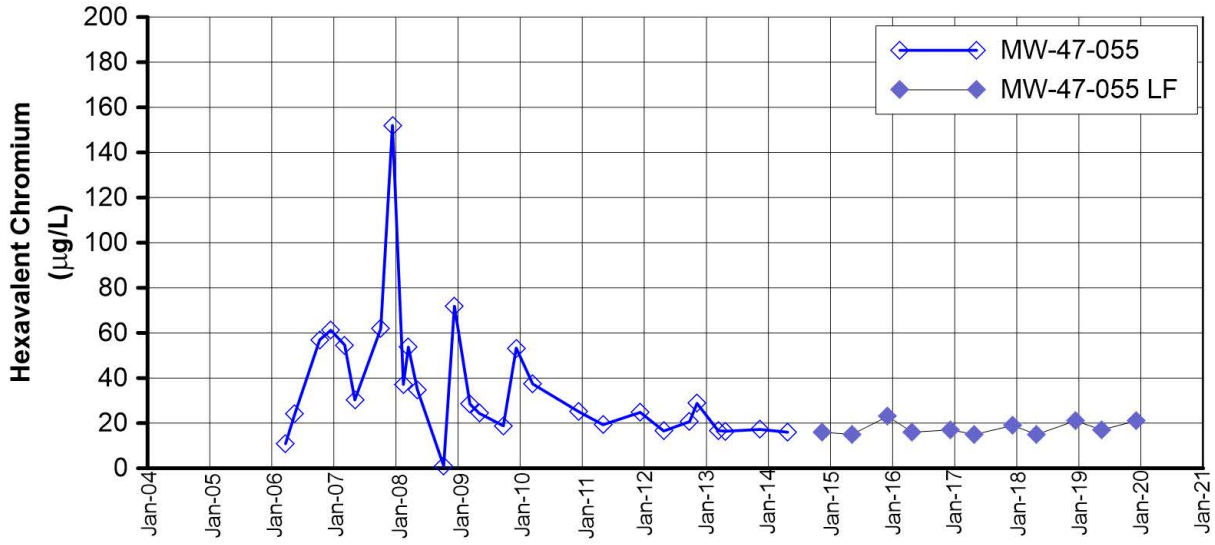
LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

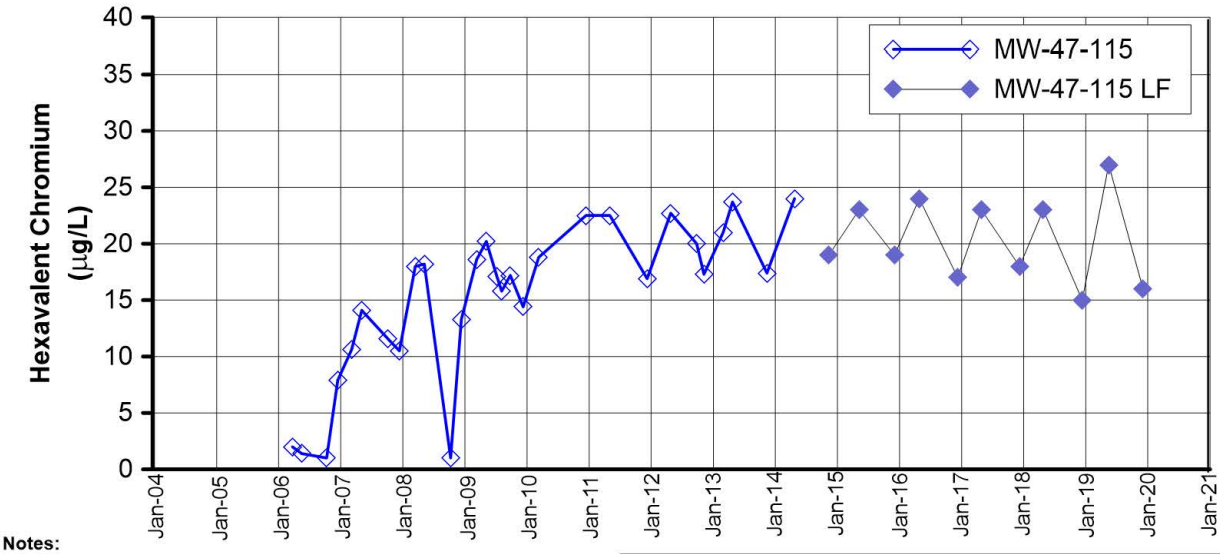
FIGURE F-10
HEXAVALENT CHROMIUM IN MW-44 CLUSTER

FOURTH QUARTER 2019 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS







Notes:

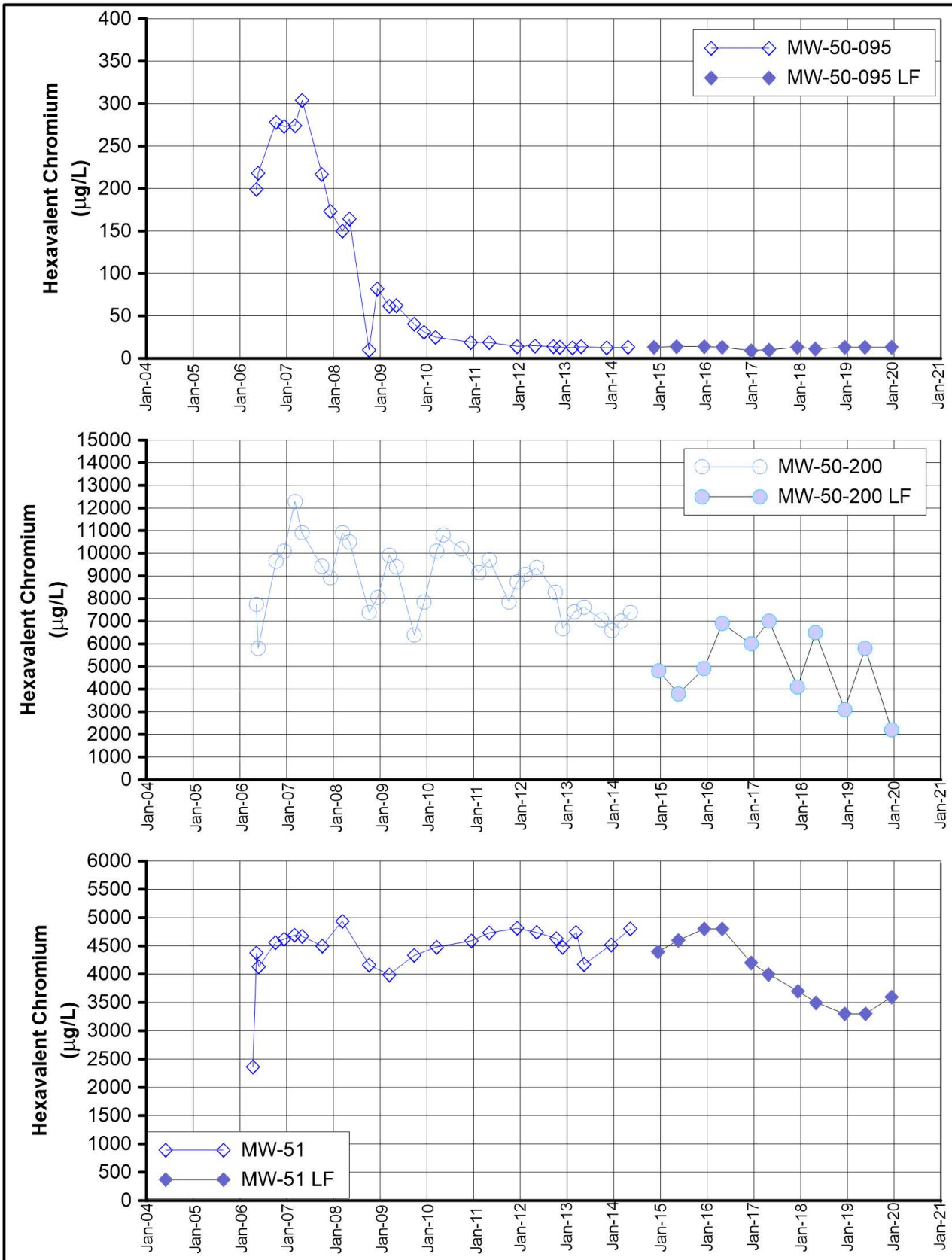
1) The IM Contingency Plan and hexavalent chromium [Cr(VI)] trigger levels were updated July 17, 2008 (DTSC, 2008b).
2) The trigger level for MW-46-175 is 225 µg/L.
3) The trigger level for MW-46-205 is 20 µg/L.
4) The trigger level for MW-47-055 is 475 µg/L.
5) The trigger level for MW-47-115 is 31 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 F-11
HEXAVALENT CHROMIUM
IN MW-46 AND MW-47 CLUSTERS

FOURTH QUARTER 2019 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS

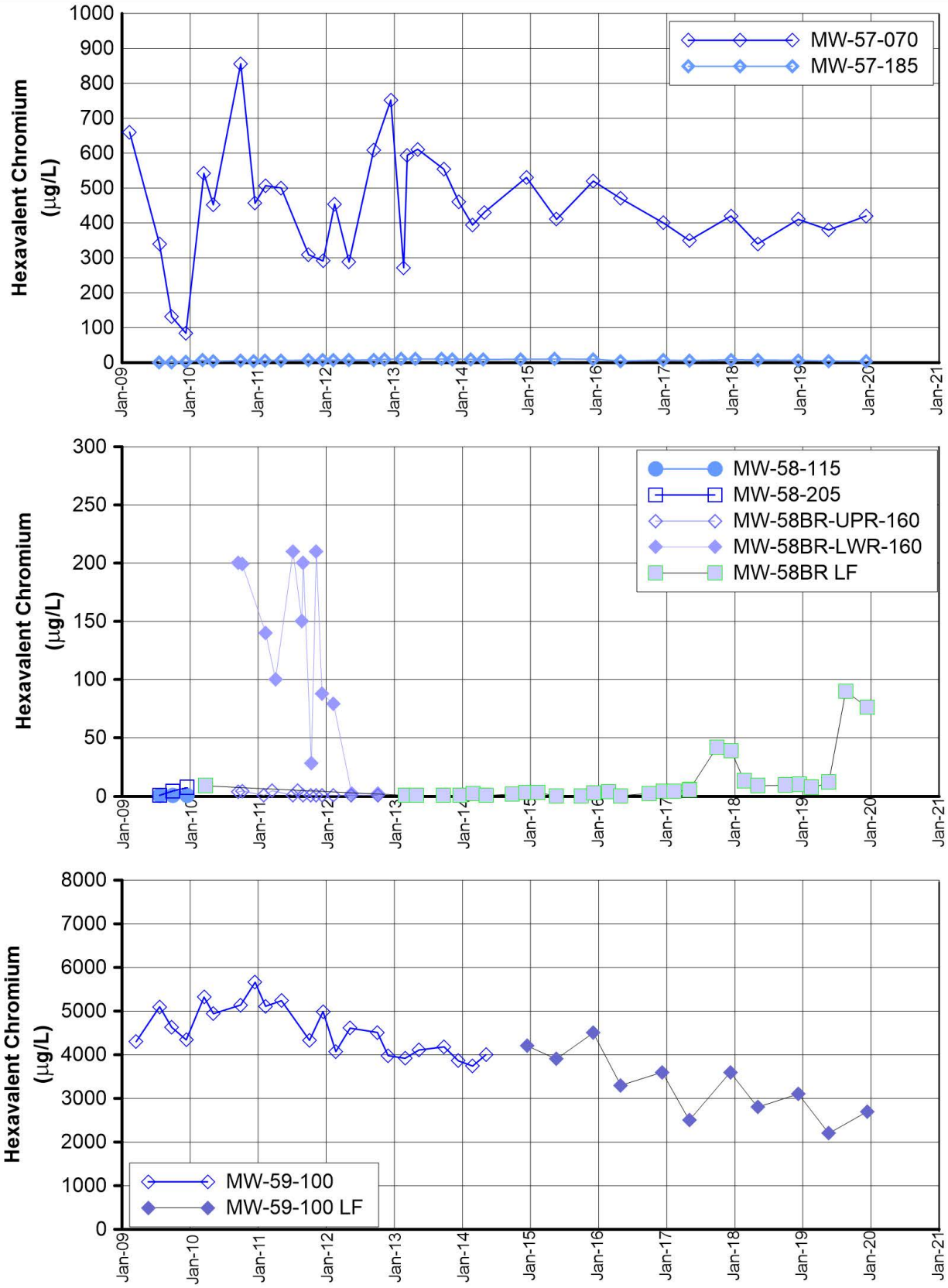


Notes:

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 F-12
HEXAVALENT CHROMIUM
IN MW-50 AND MW-51 CLUSTERS
FOURTH QUARTER 2019 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS



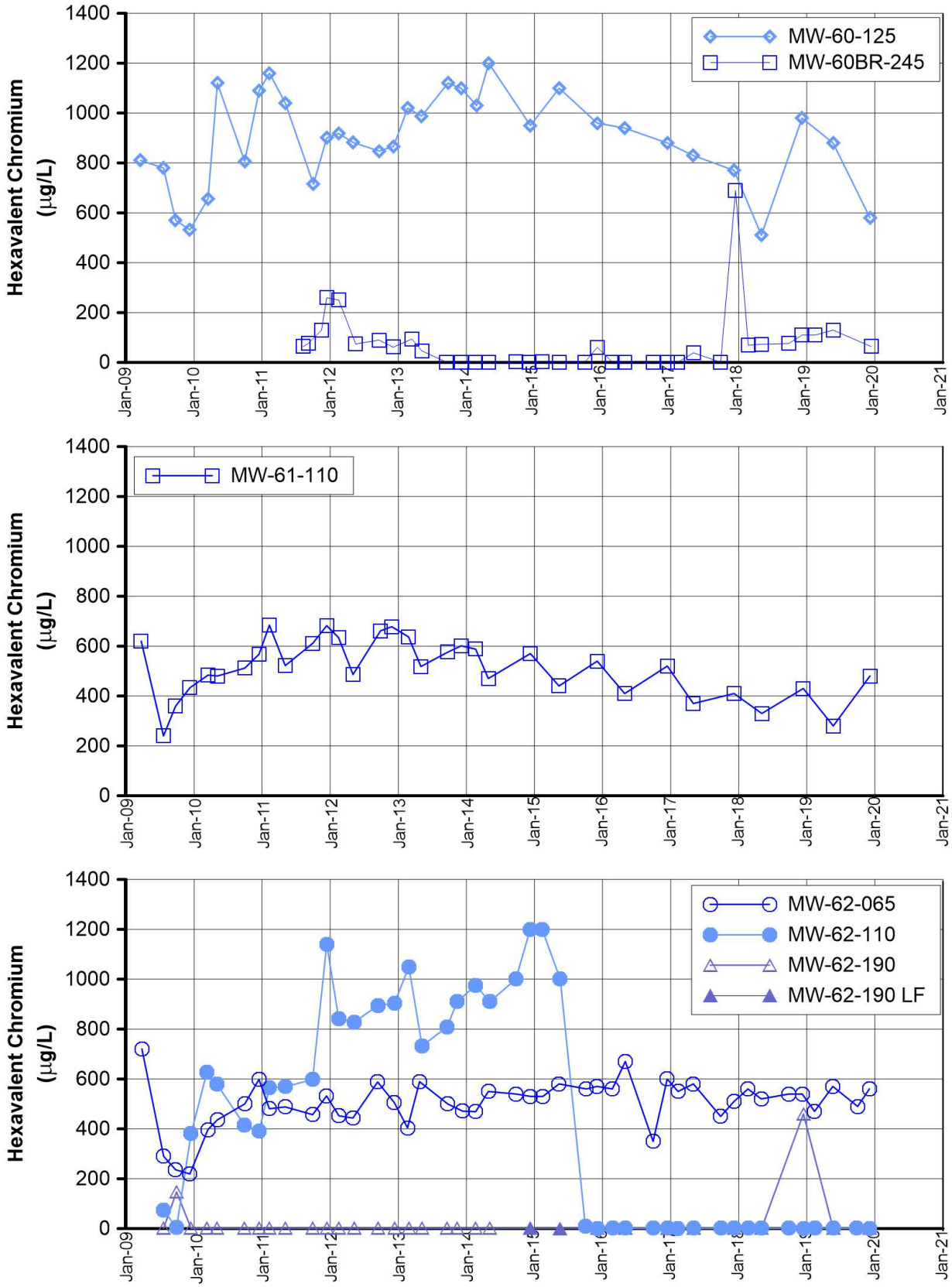
Note:

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

FOURTH QUARTER 2019 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS

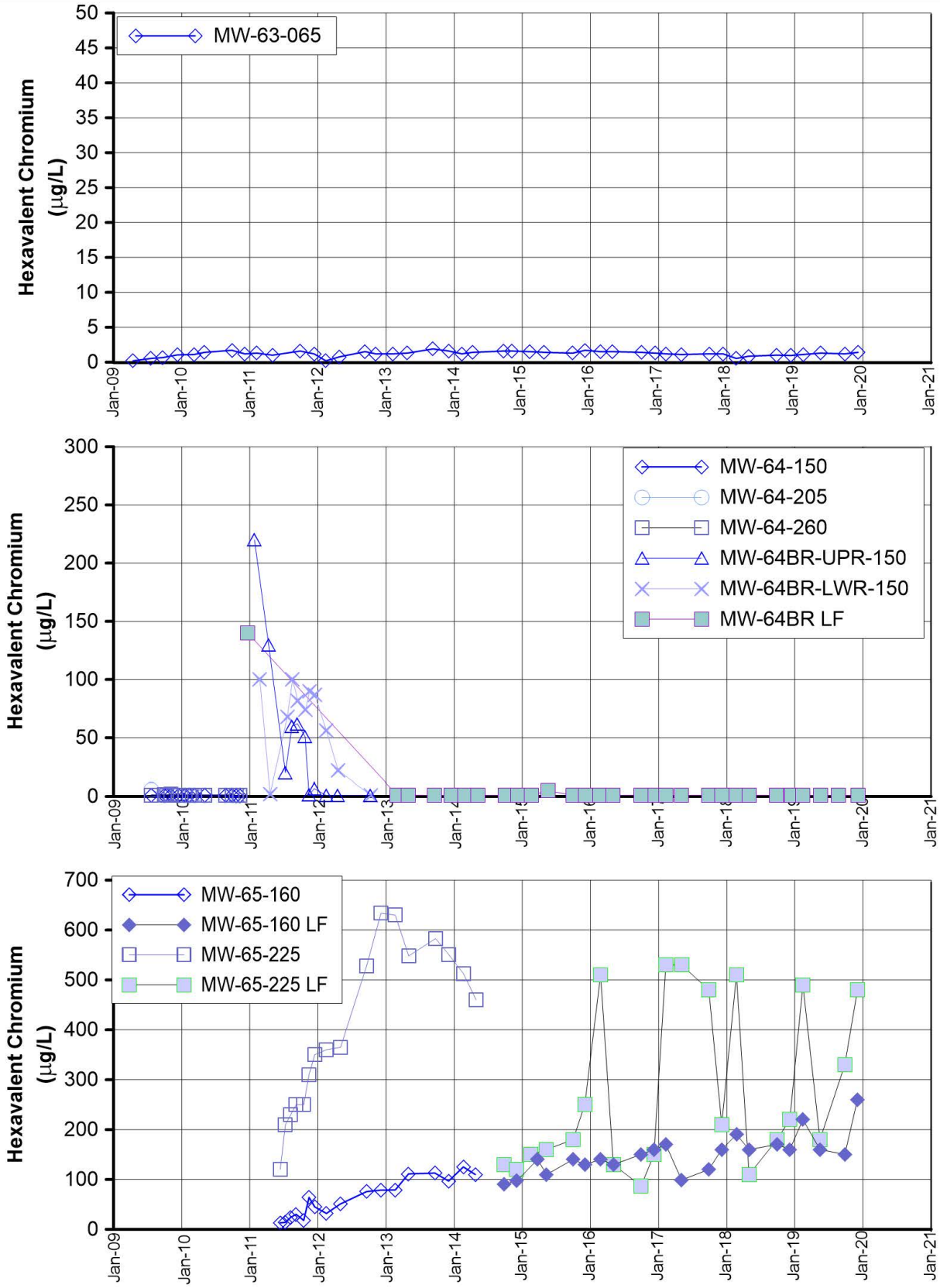


Notes:

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 F-14
HEXAVALENT CHROMIUM
IN MW-60 CLUSTER, MW-61-110 AND MW-62 CLUSTER
FOURTH QUARTER 2019 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS



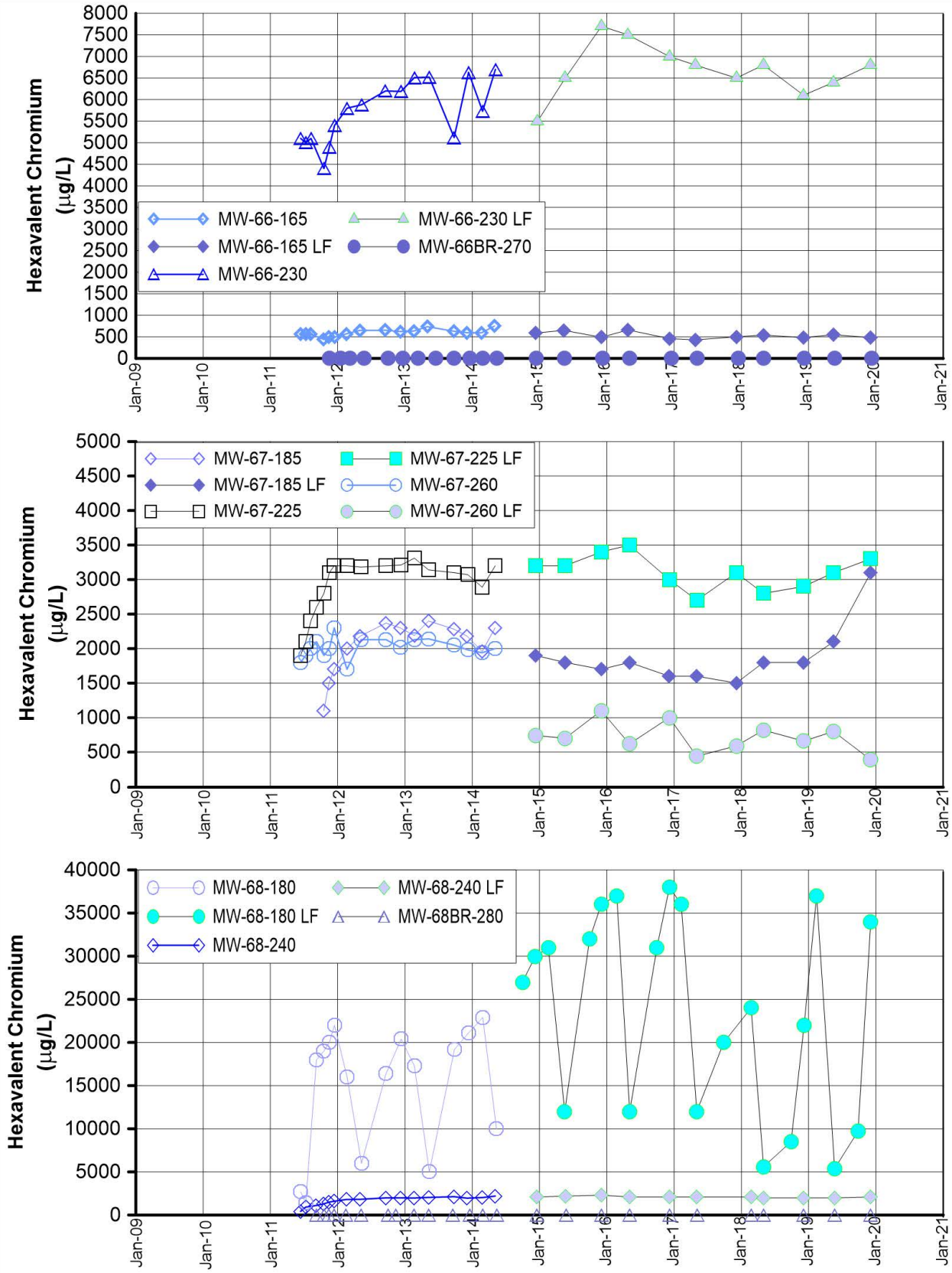
Notes:

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 F-15
HEXAVALENT CHROMIUM
IN MW-63-065, MW-64 CLUSTER AND MW-65 CLUSTER
FOURTH QUARTER 2019 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\17_Q419



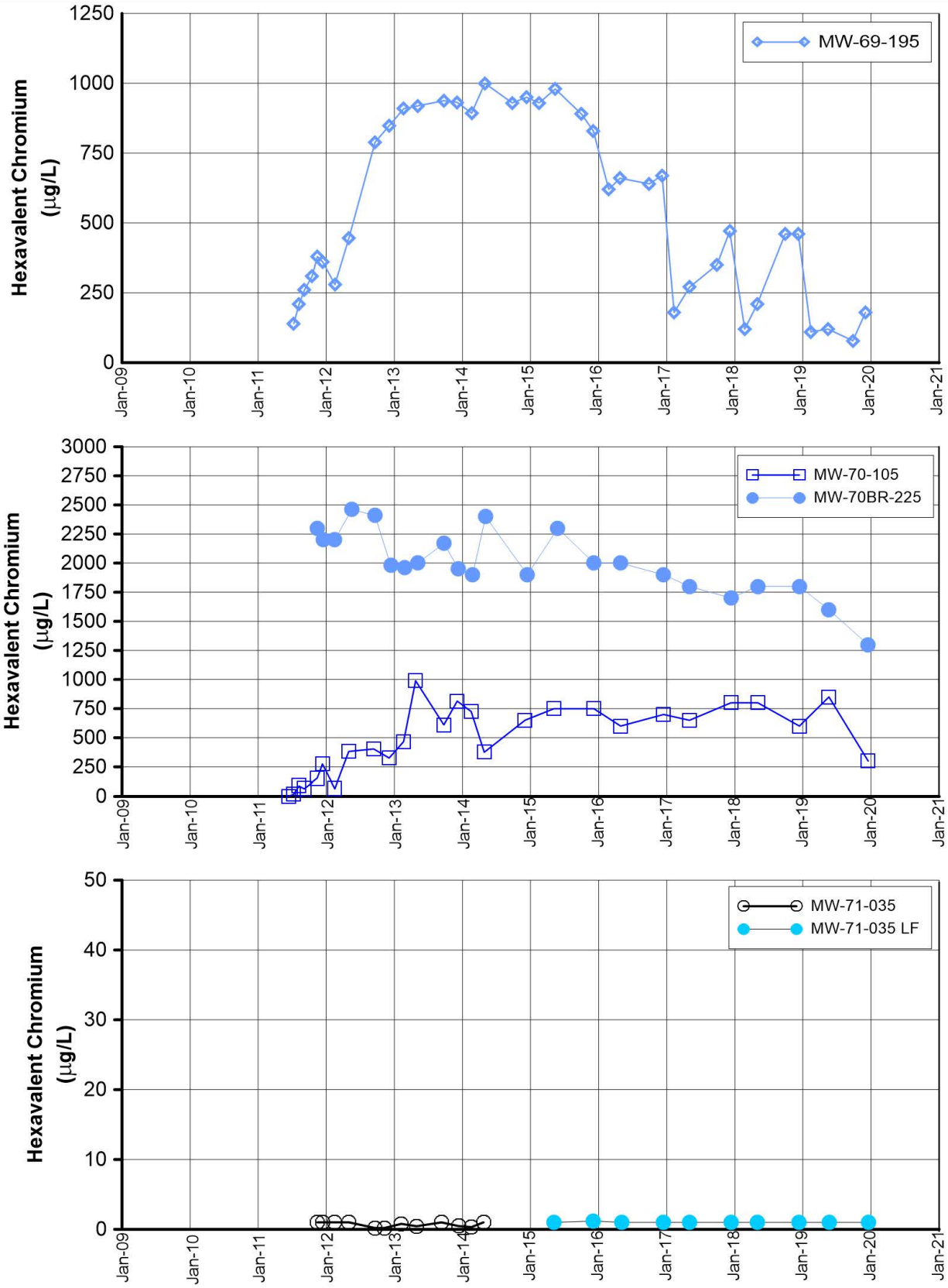
Notes:

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 F-16
HEXAVALENT CHROMIUM
IN MW-66, MW-67, AND MW-68 CLUSTERS
FOURTH QUARTER 2019 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\17_Q419



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 F-17
HEXAVALENT CHROMIUM
IN MW-69-195, MW-70 CLUSTER, AND MW-71-035
FOURTH QUARTER 2019 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS

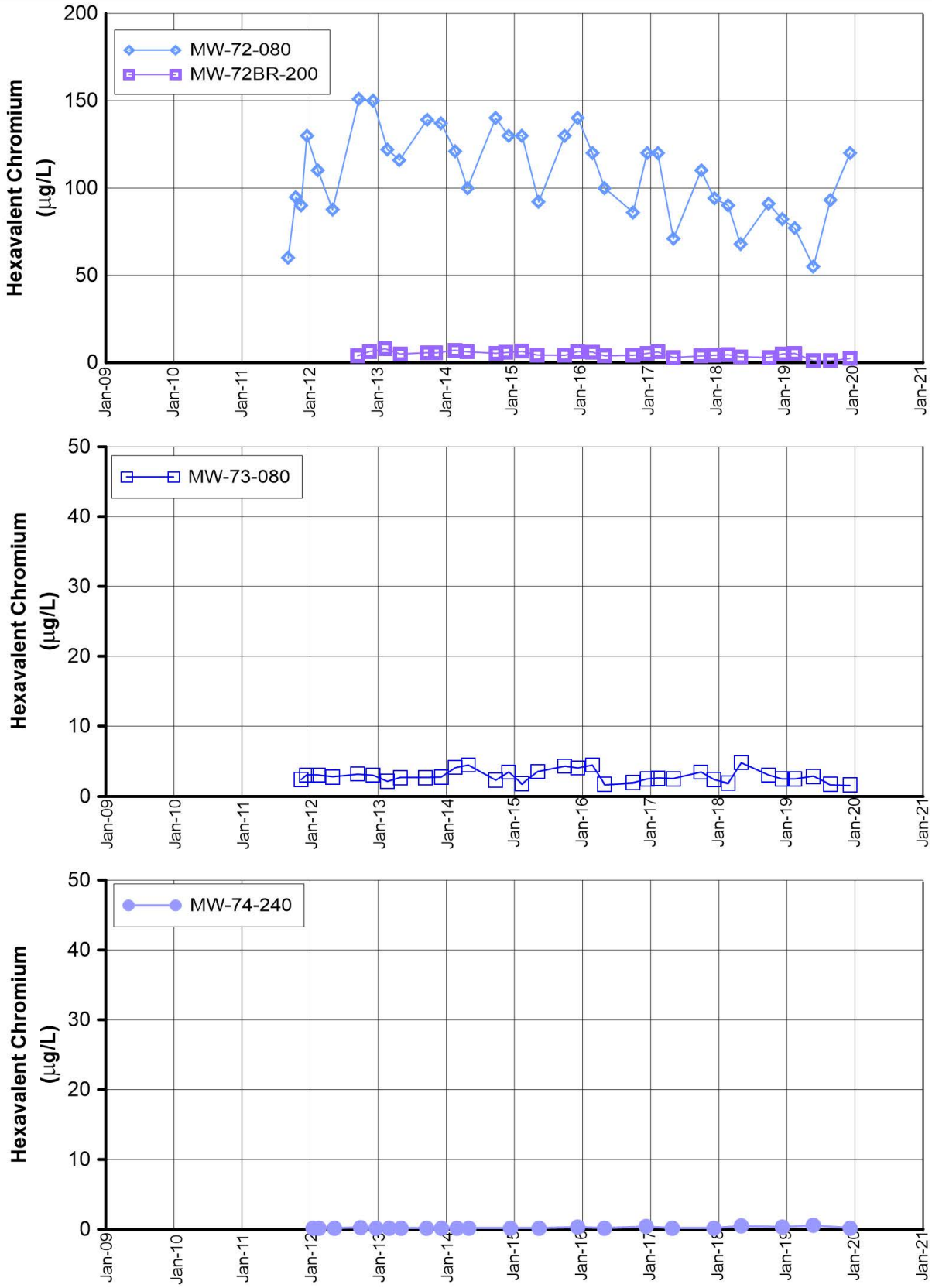


FIGURE F-18
HEXAVALENT CHROMIUM
IN MW-72 CLUSTER, MW-73-080, AND MW-74-240
FOURTH QUARTER 2019 INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS

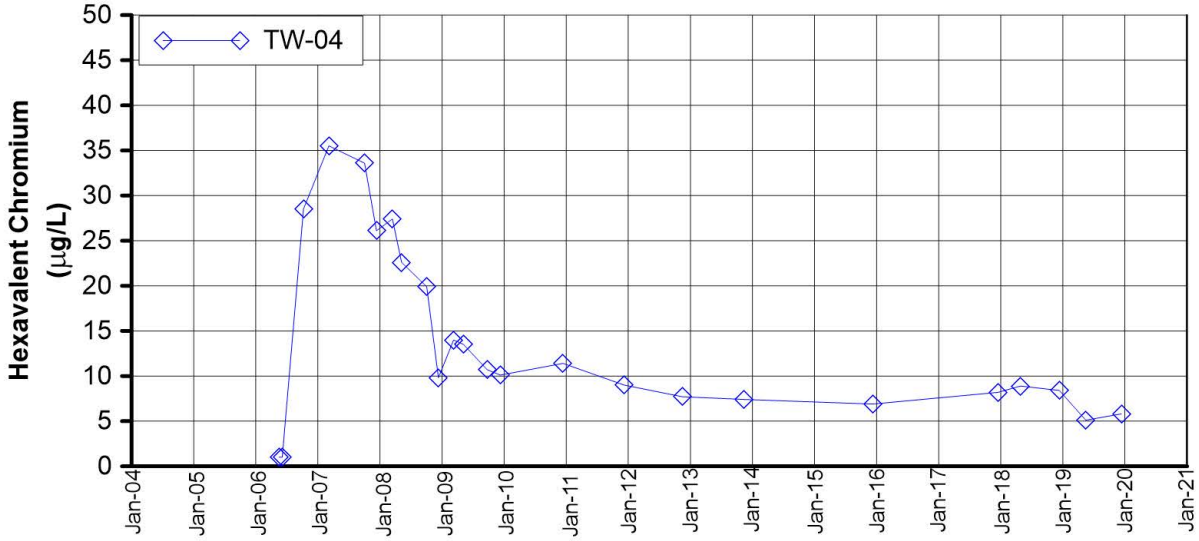
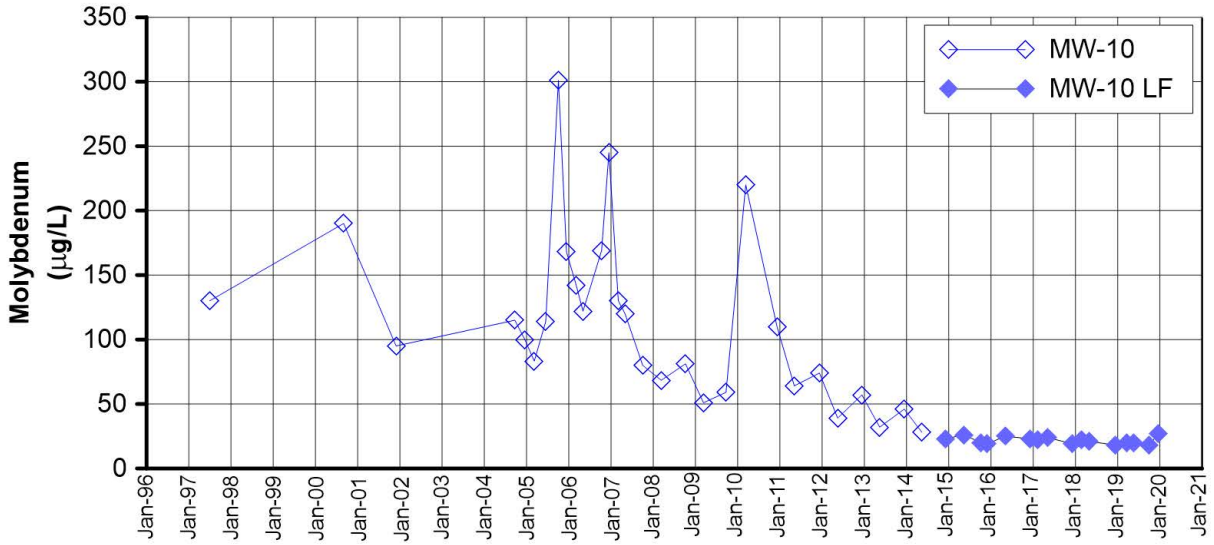
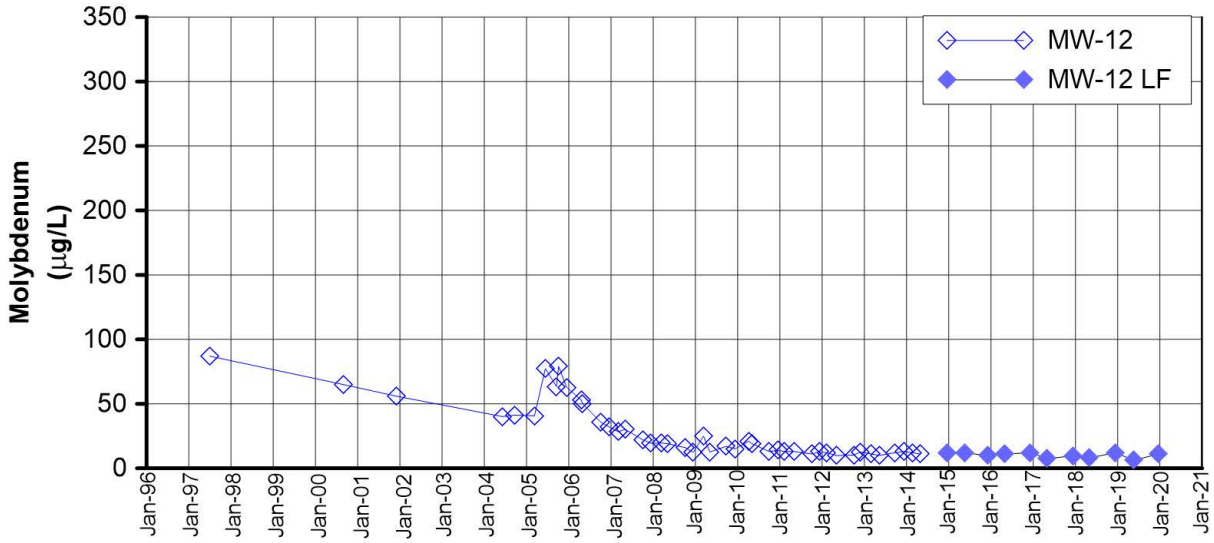


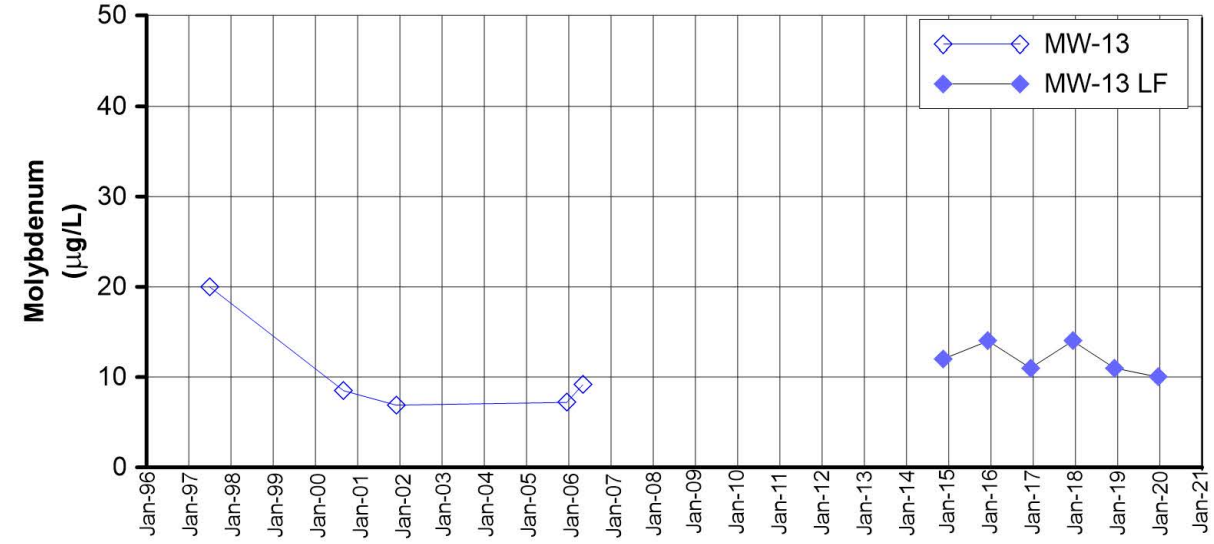
FIGURE F-19
HEXAVALENT CHROMIUM
IN TW-04

FOURTH QUARTER 2019 INTERIM MEASURES PERFORMANCE
MONITORING AND SITE-WIDE GROUNDWATER
AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS





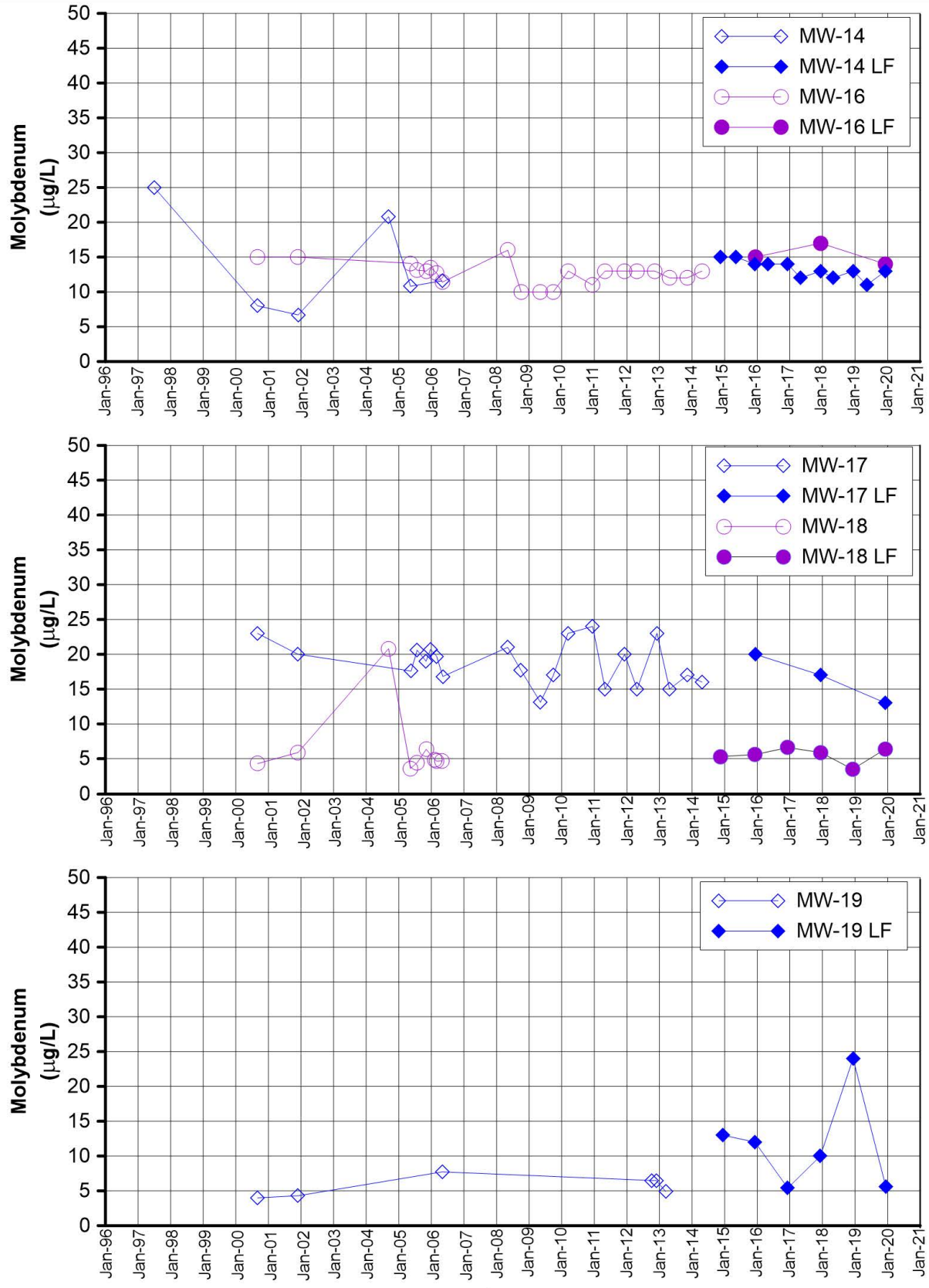


Notes:

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 F-20
MOLYBDENUM
IN MW-10, MW-12, AND MW-13
FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS

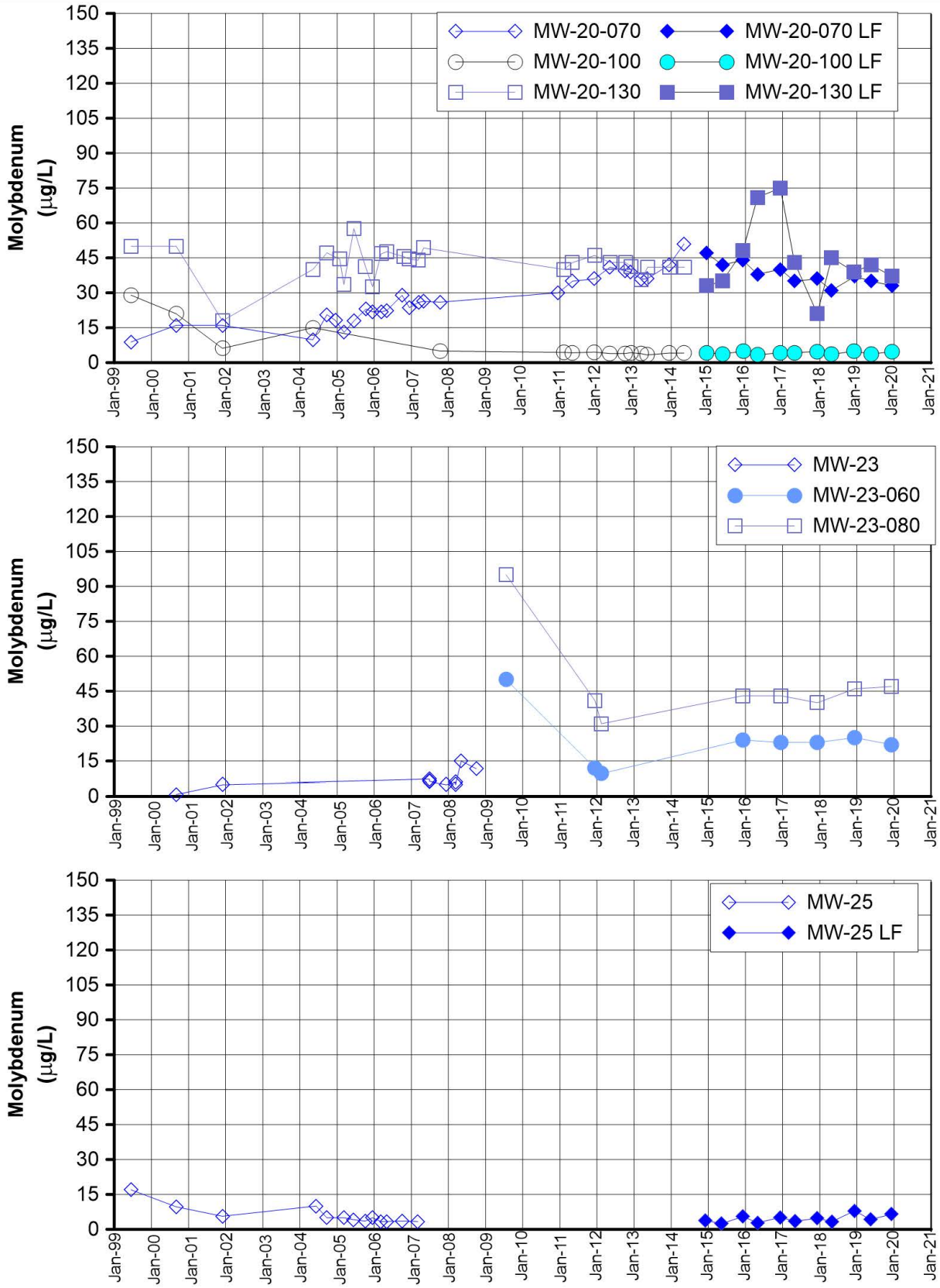


Notes:

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.

FIGURE F-21
MOLYBDENUM
IN MW-14, MW-16, MW-17, MW-18, AND MW-19
FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS

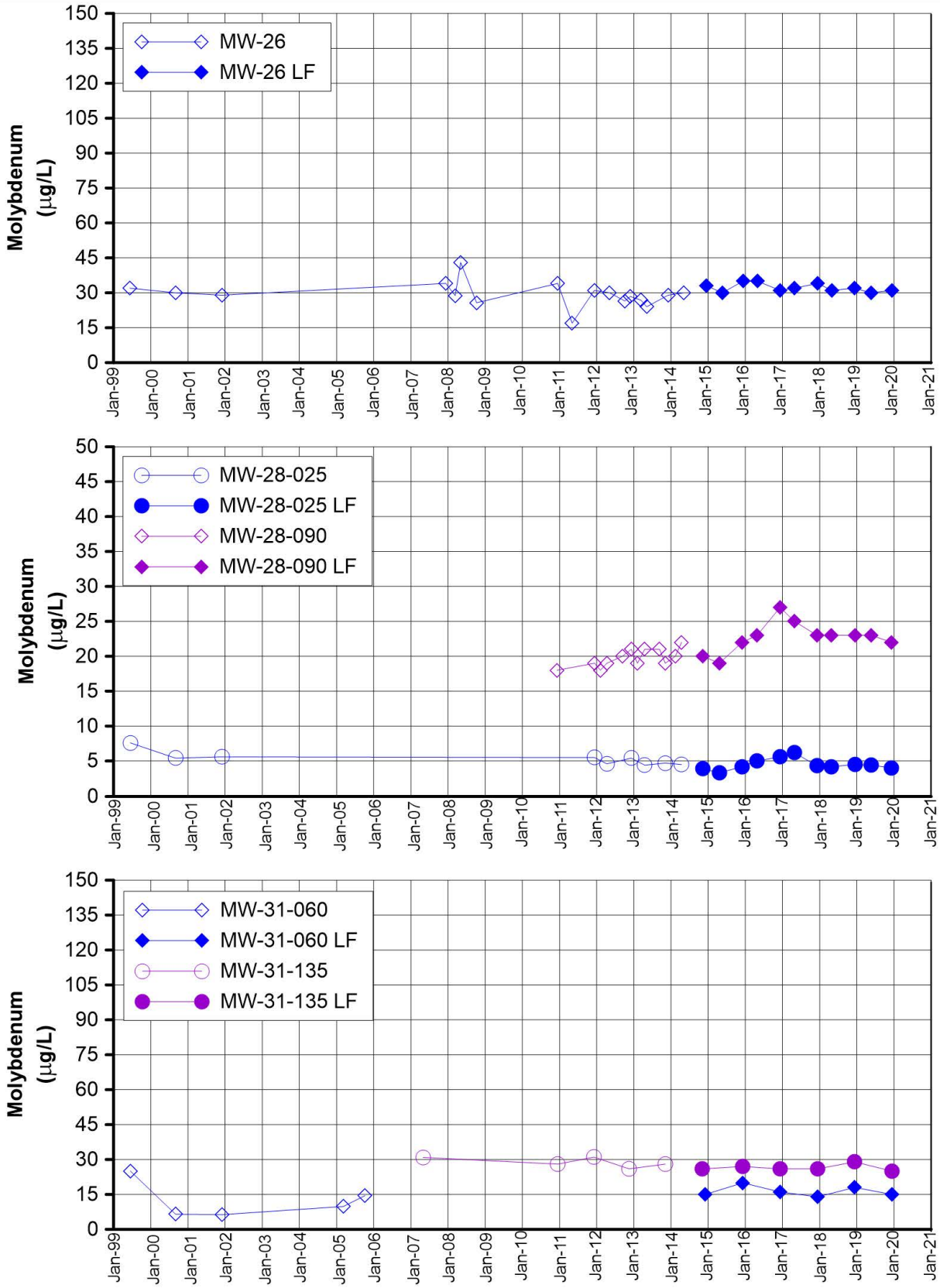


Notes:

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 F-22
MOLYBDENUM
IN MW-20, MW-23, AND MW-25 CLUSTERS
FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS

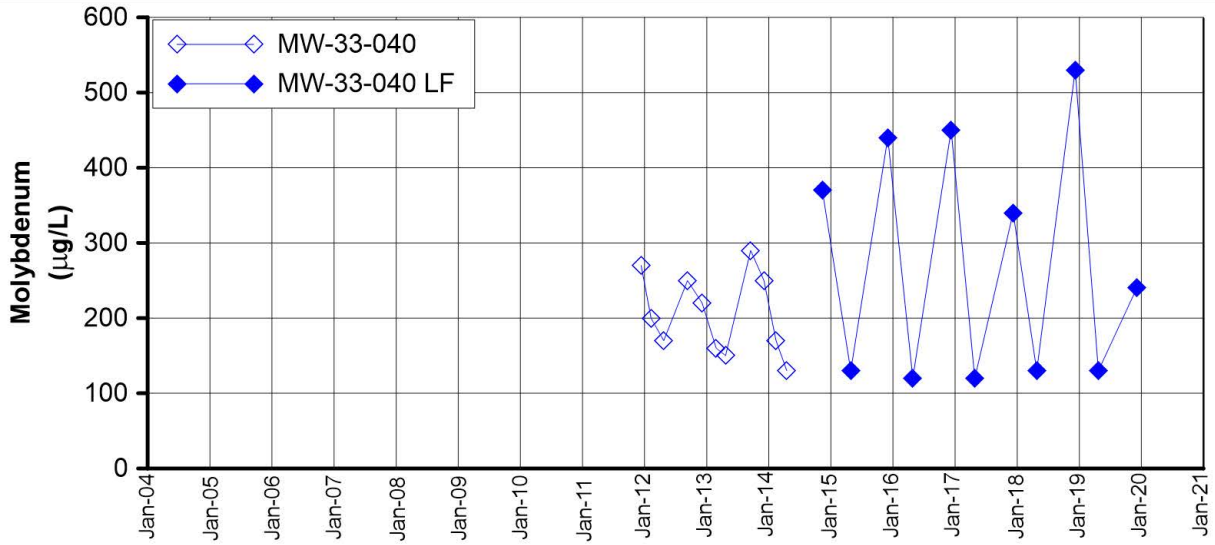


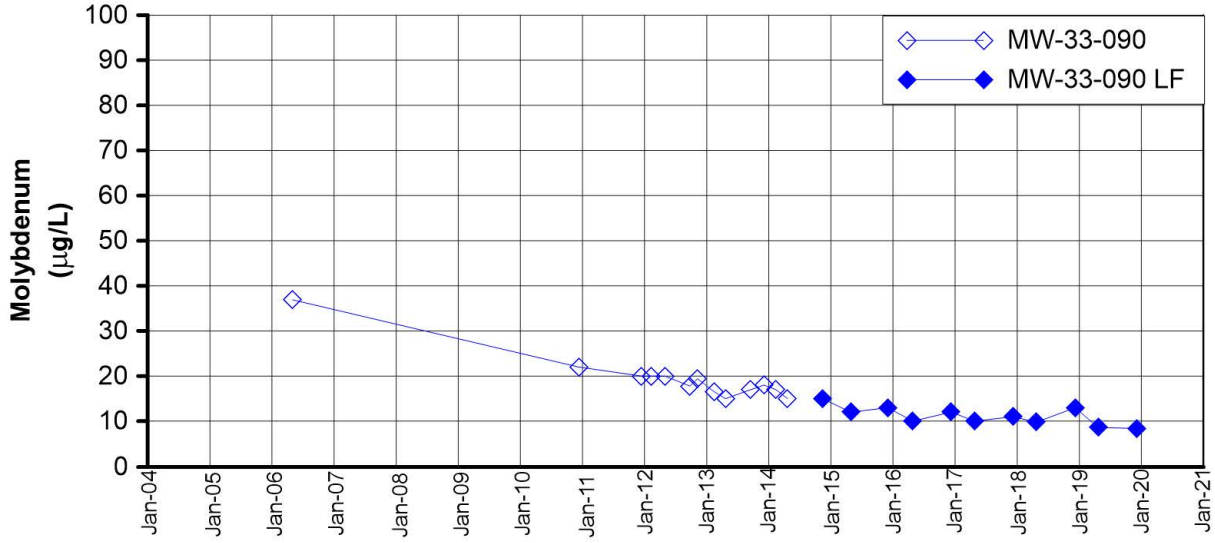
Notes:

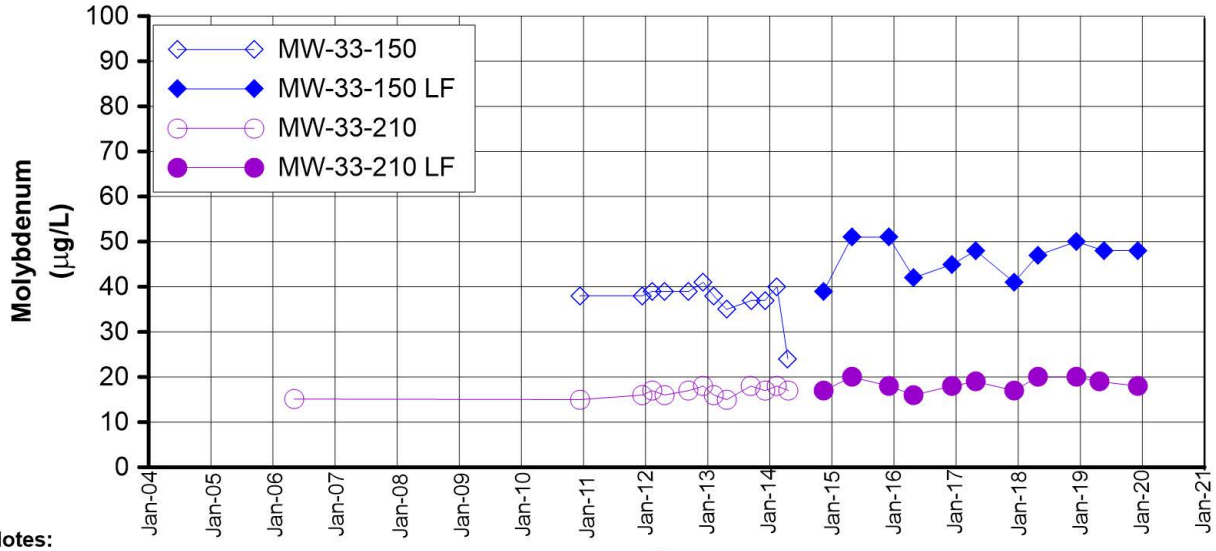
LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

FIGURE F-23
MOLYBDENUM
IN MW-26, MW-28, AND MW-31 CLUSTERS
FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS







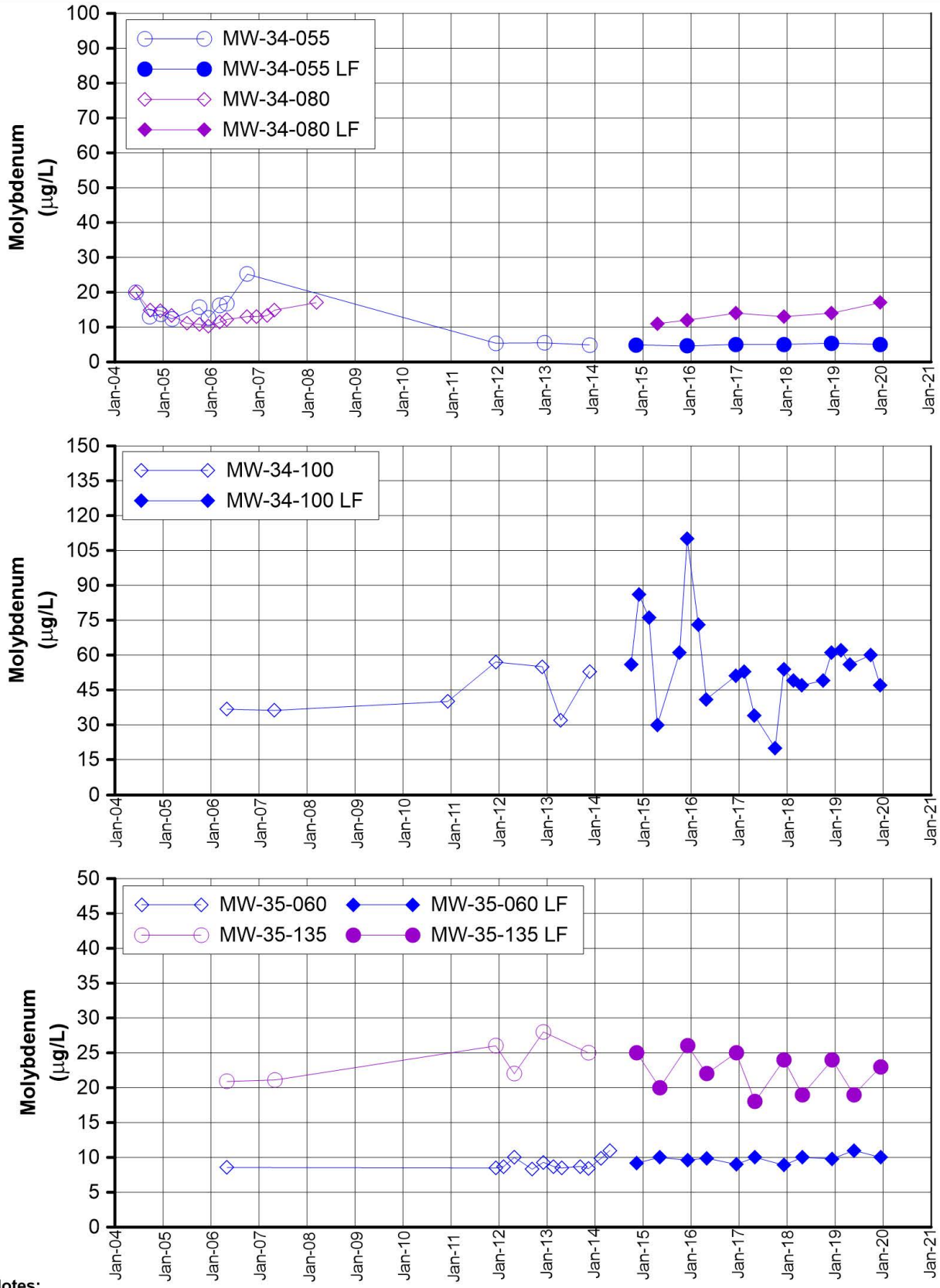
Notes:

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 F-24
MOLYBDENUM
IN MW-33 CLUSTER

FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS



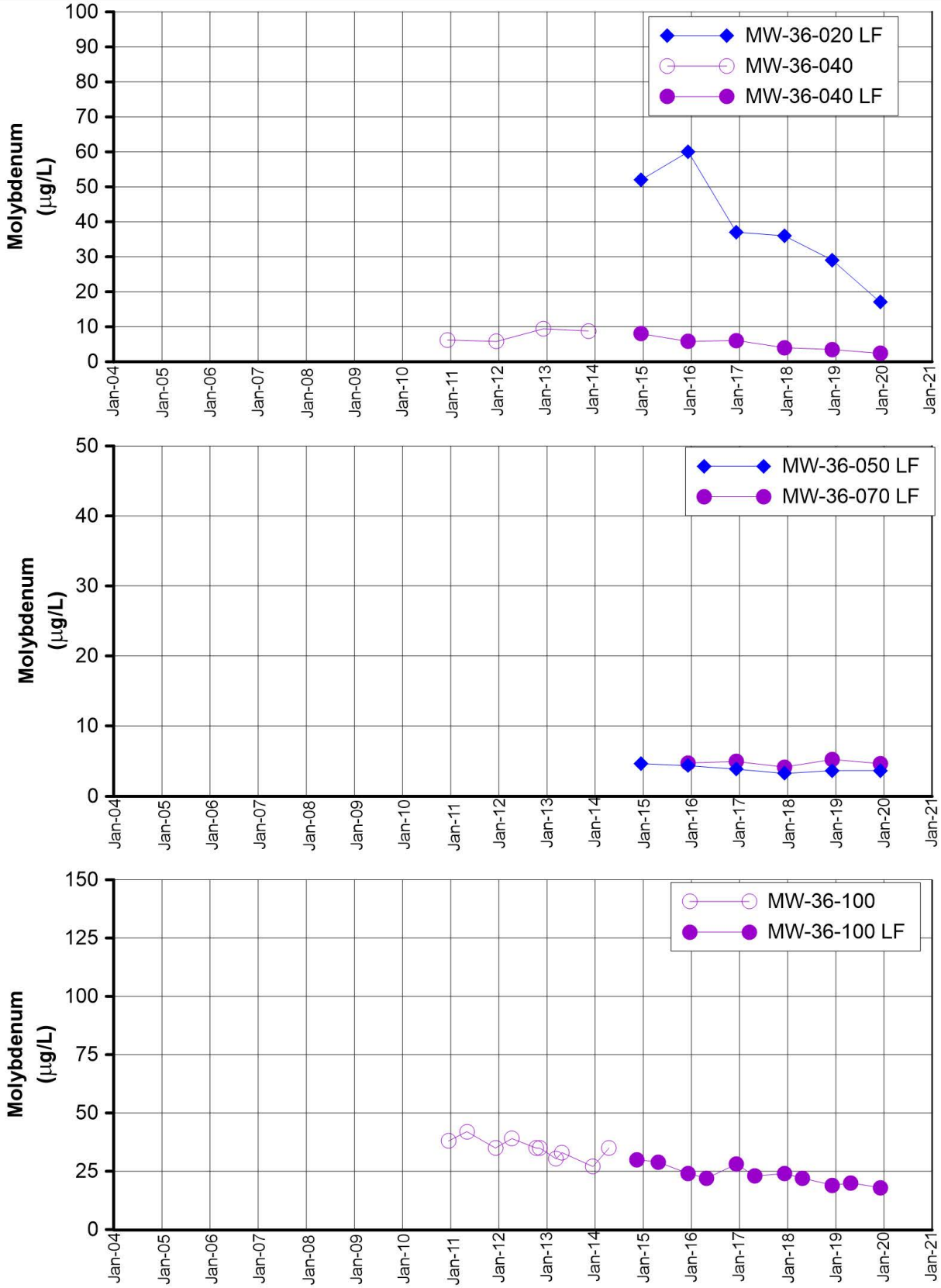
Notes:

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 F-25
MOLYBDENUM
IN MW-34 AND MW-35 CLUSTERS
FOURTH QUARTER 2019 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\17_Q419



Notes:

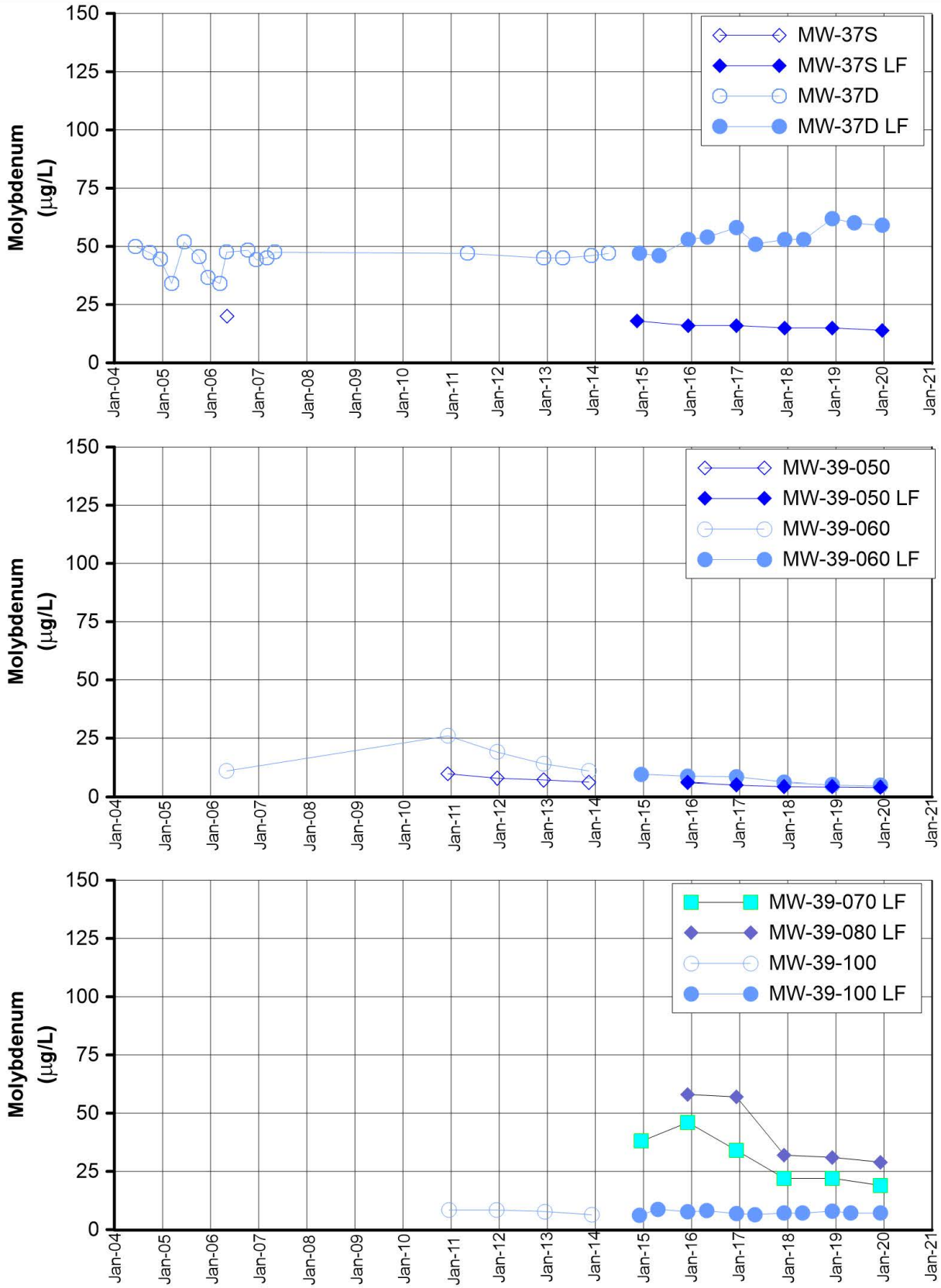
LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

FIGURE F-26
MOLYBDENUM
IN MW-36 CLUSTER

FOURTH QUARTER 2019 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\17_Q419

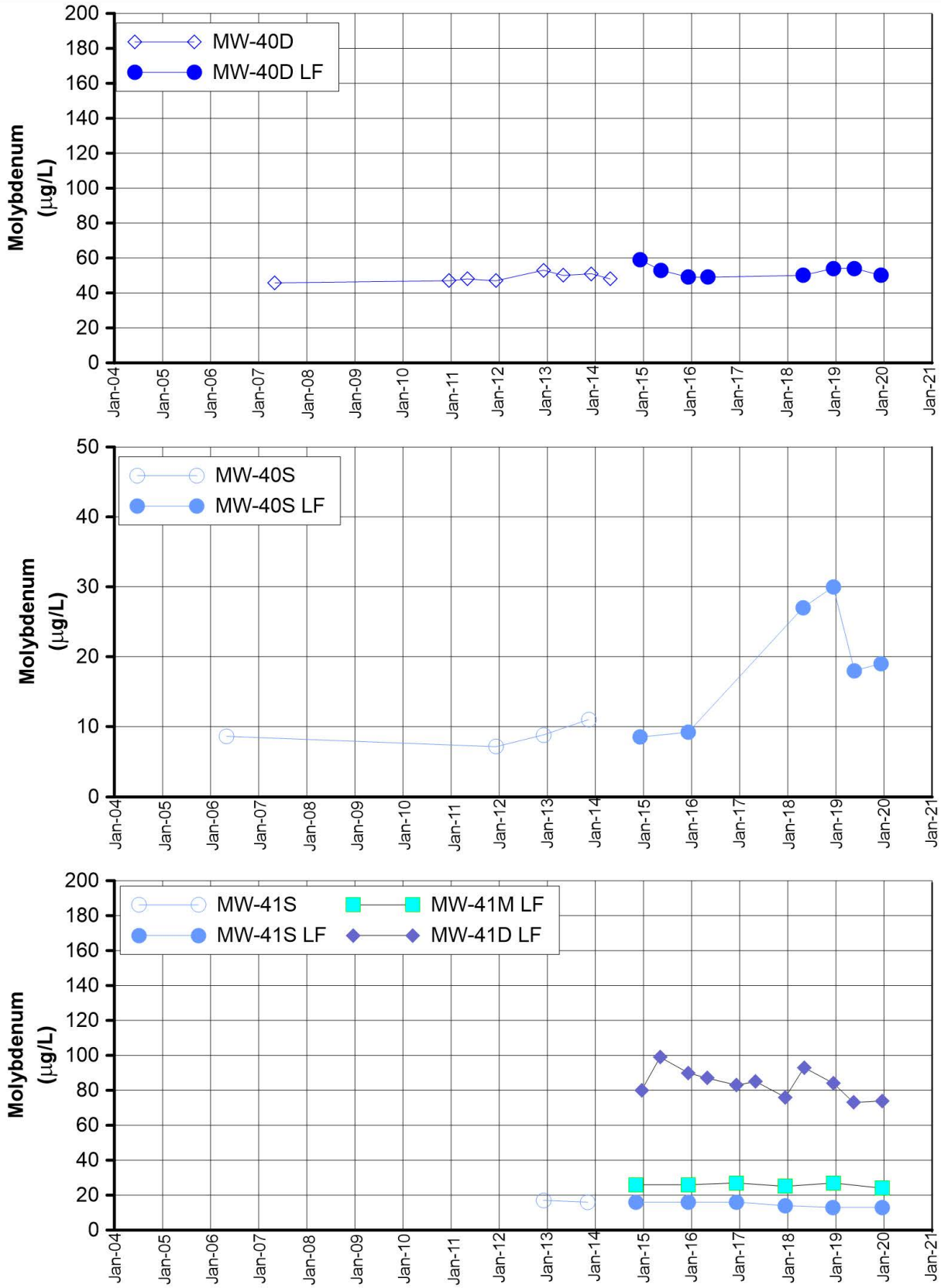


Notes:

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 F-27
MOLYBDENUM
IN MW-37 AND MW-39 CLUSTERS
FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS

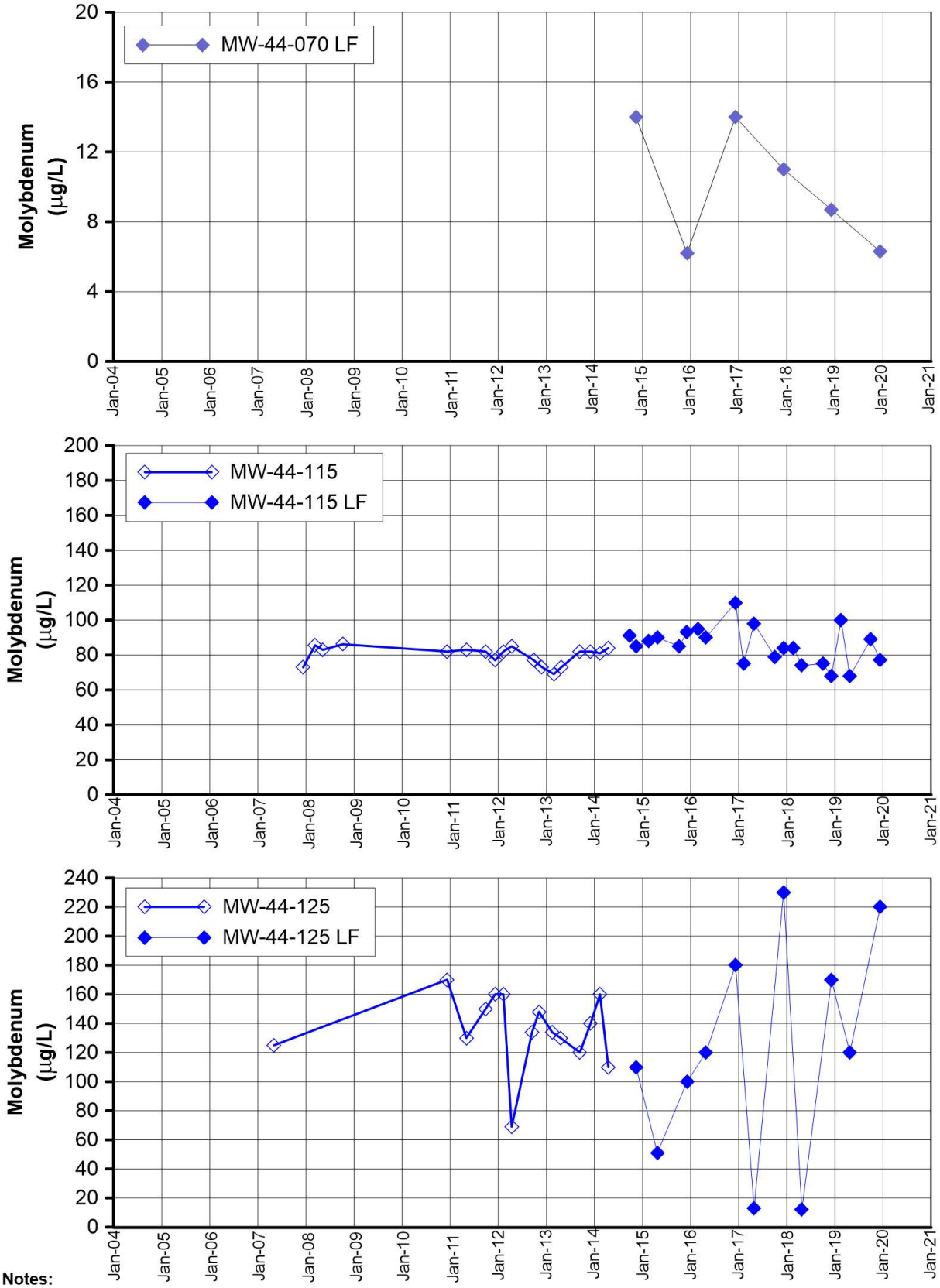


Notes:

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 2017 due to traffic control issues.

FIGURE F-28
MOLYBDENUM
IN MW-40 AND MW-41 CLUSTERS
FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS



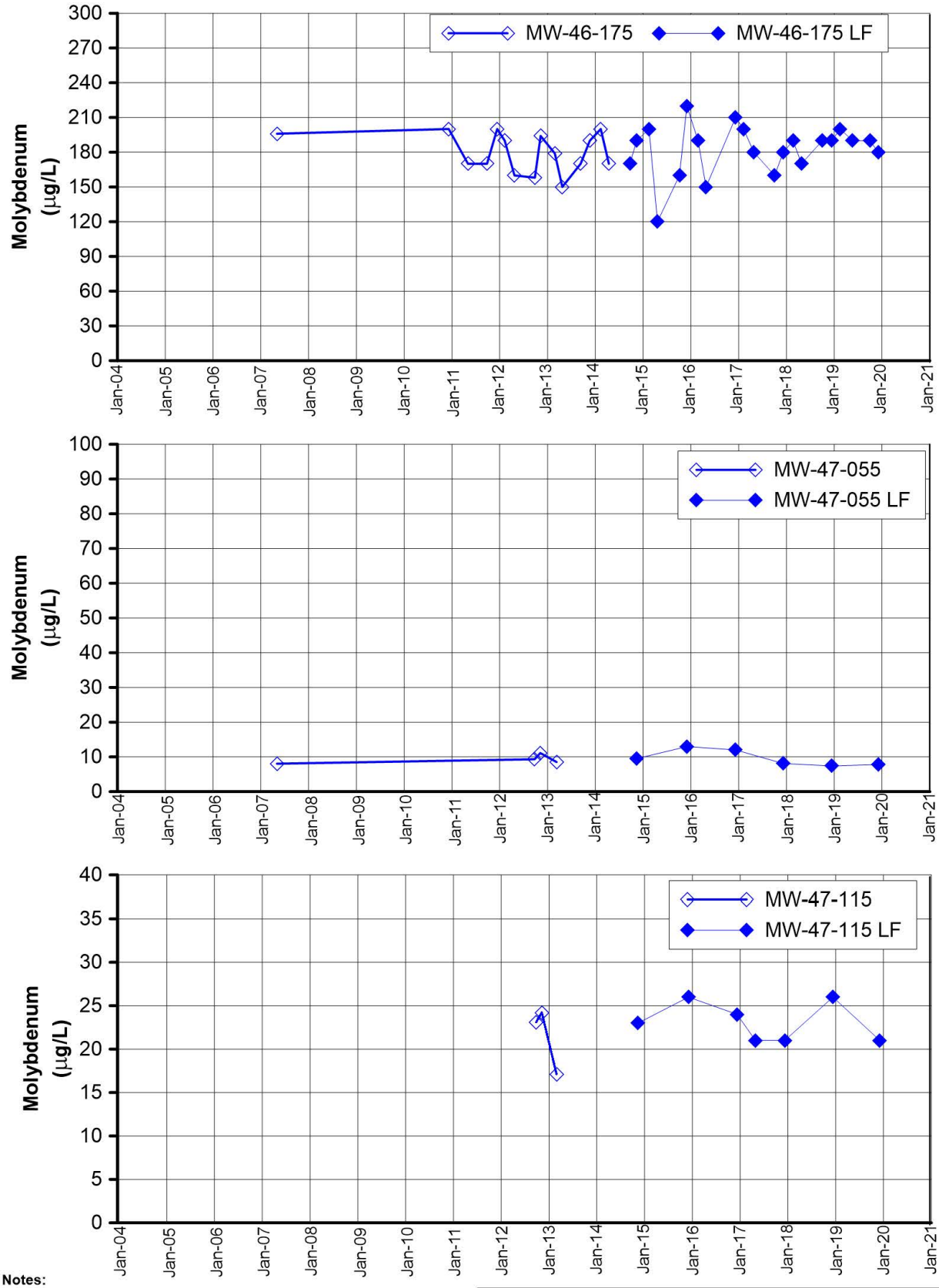
Notes:

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 F-29
MOLYBDENUM
IN MW-44 CLUSTER

FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS

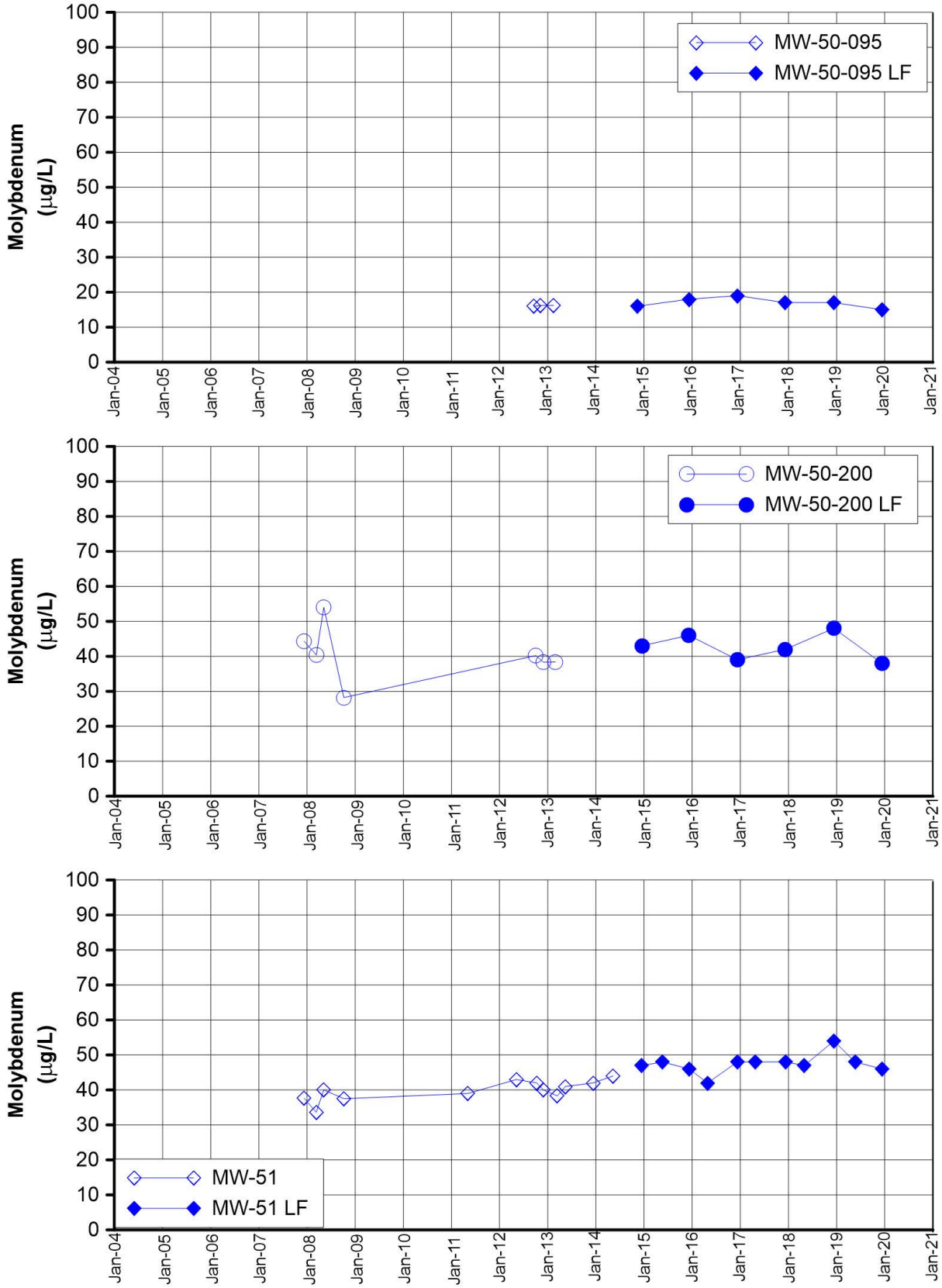


Notes:

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 F-30
MOLYBDENUM
IN MW-46 AND MW-47 CLUSTERS
FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS

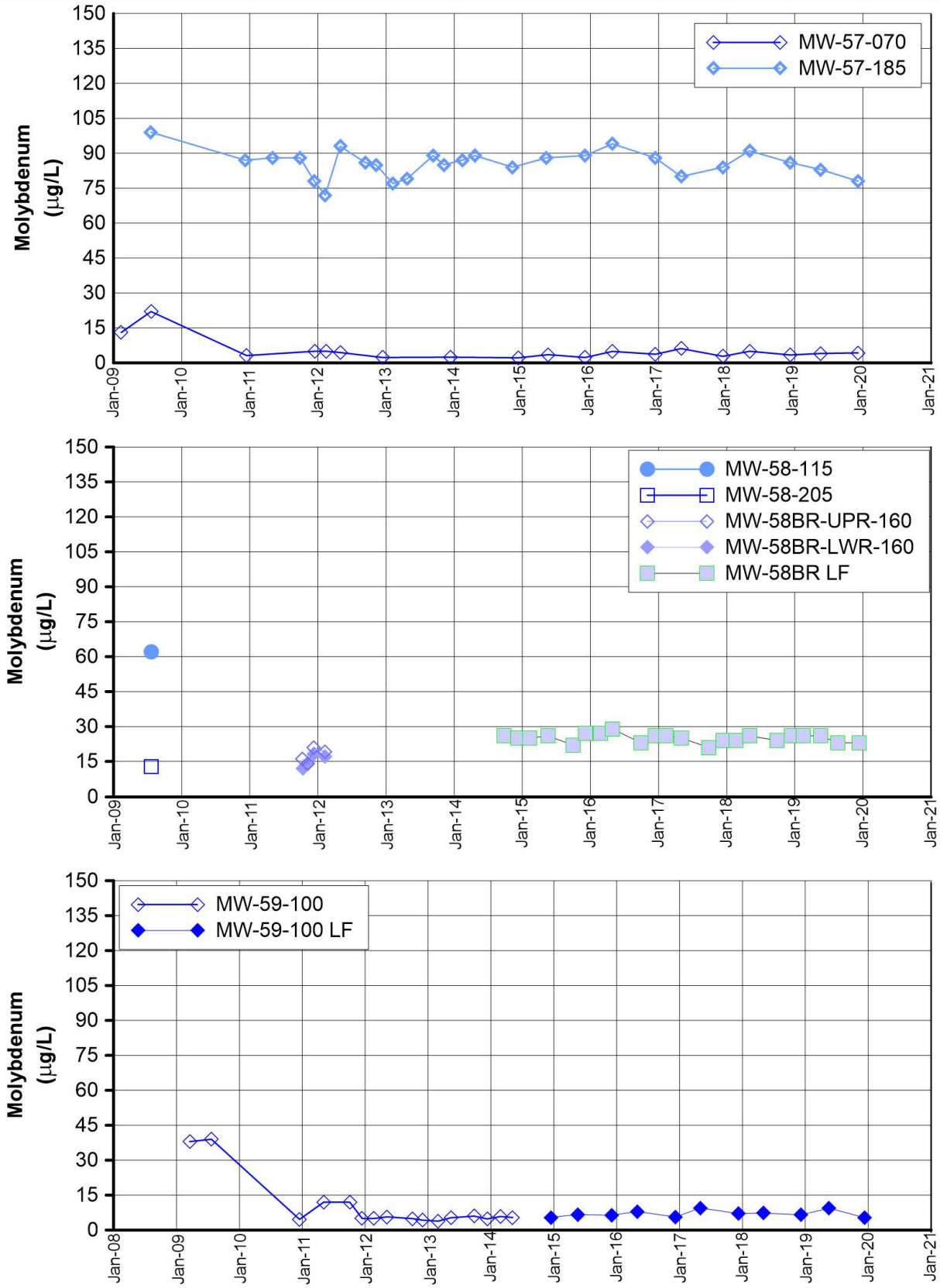


Notes:

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 F-31
MOLYBDENUM
IN MW-50 AND MW-51 CLUSTERS
FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS

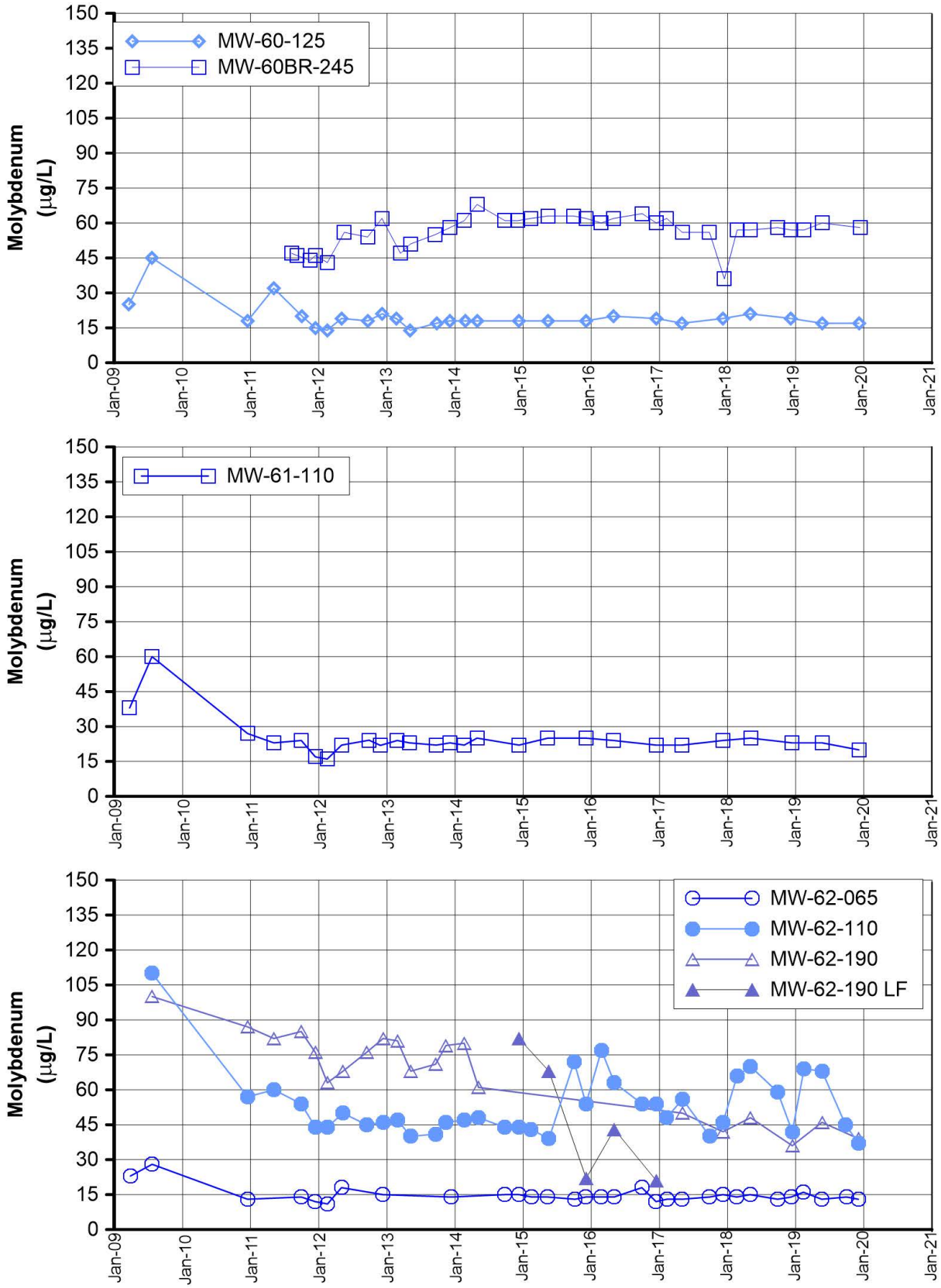


Note:

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 F-32
MOLYBDENUM
IN MW-57 CLUSTER, MW-58 CLUSTER AND MW-59-100
FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS



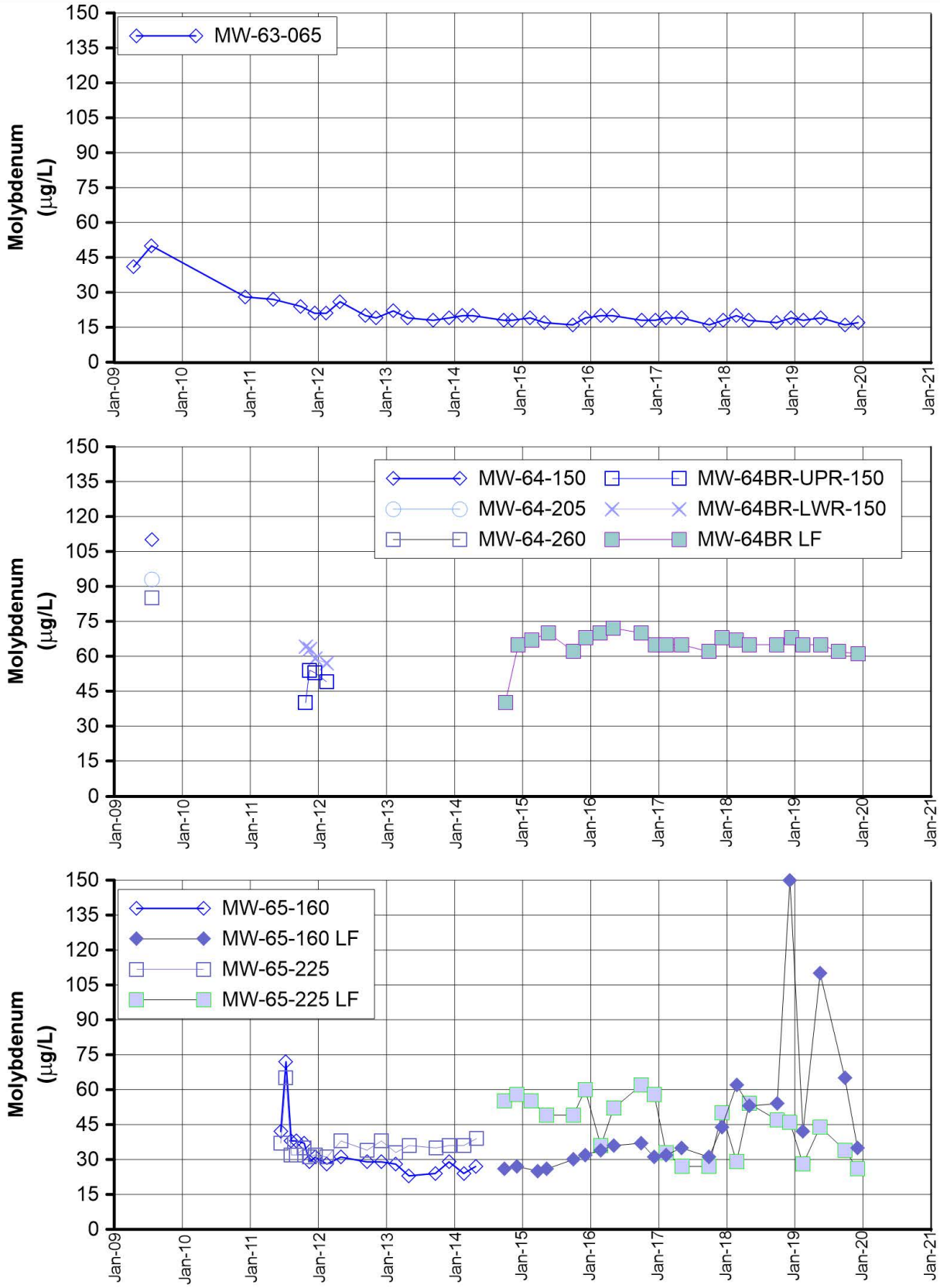
Notes:

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 5/02/2017 & 12/06/2017.
2. MW-62-065 sampled using LF method on 5/02/2017, 9/25/2017, & 12/06/2017.

FIGURE F-33
MOLYBDENUM
IN MW-60 CLUSTER, MW-61-110, AND MW-62 CLUSTER
FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS



Notes:

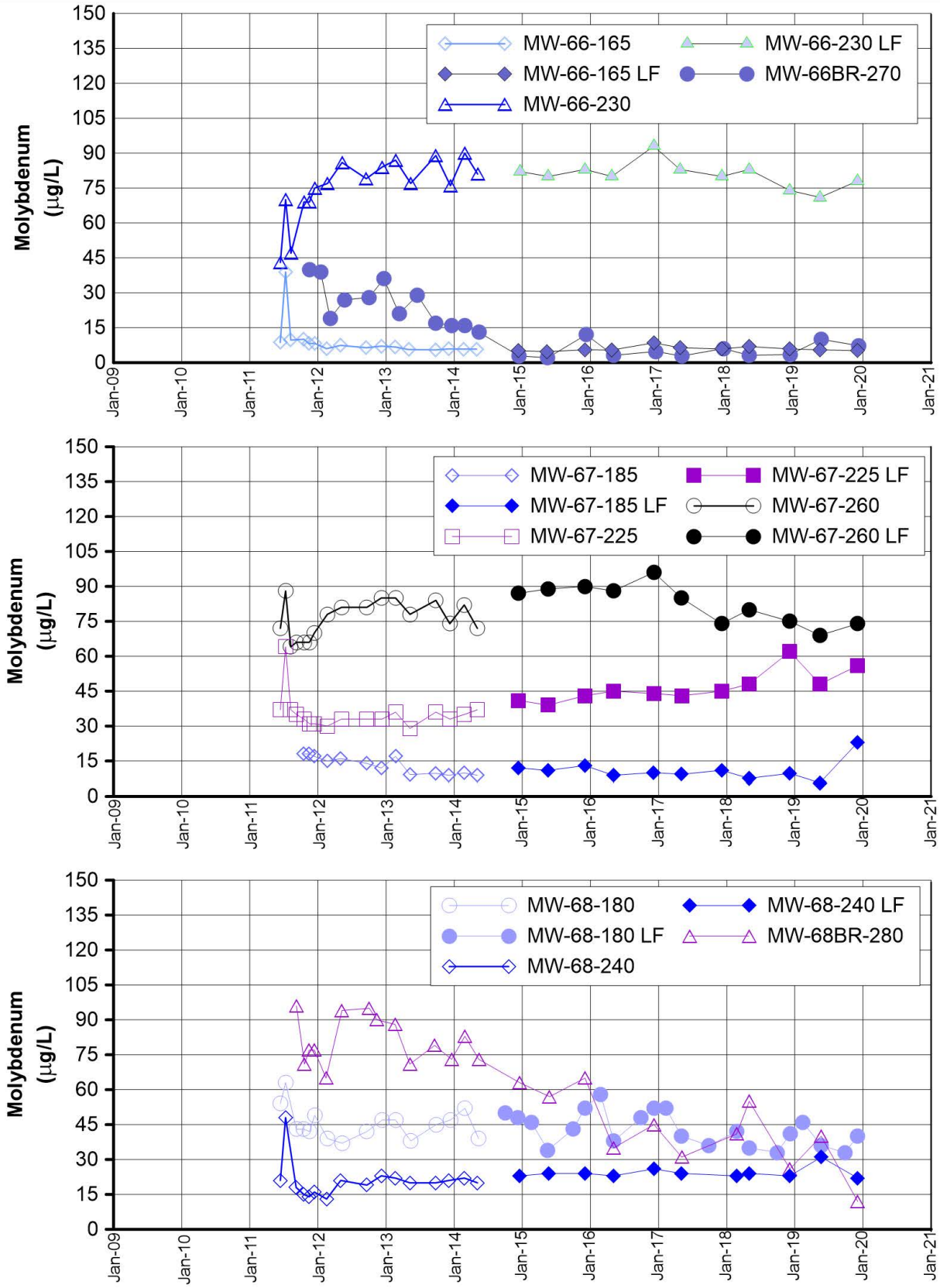
LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

1. MW-63-065 sampled using LF method on 5/02/2017, 9/28/2017, & 12/12/2017.

FIGURE F-34
MOLYBDENUM
IN MW-63-065, MW-64 CLUSTER AND MW-65 CLUSTER
FOURTH QUARTER 2019 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\17_Q419

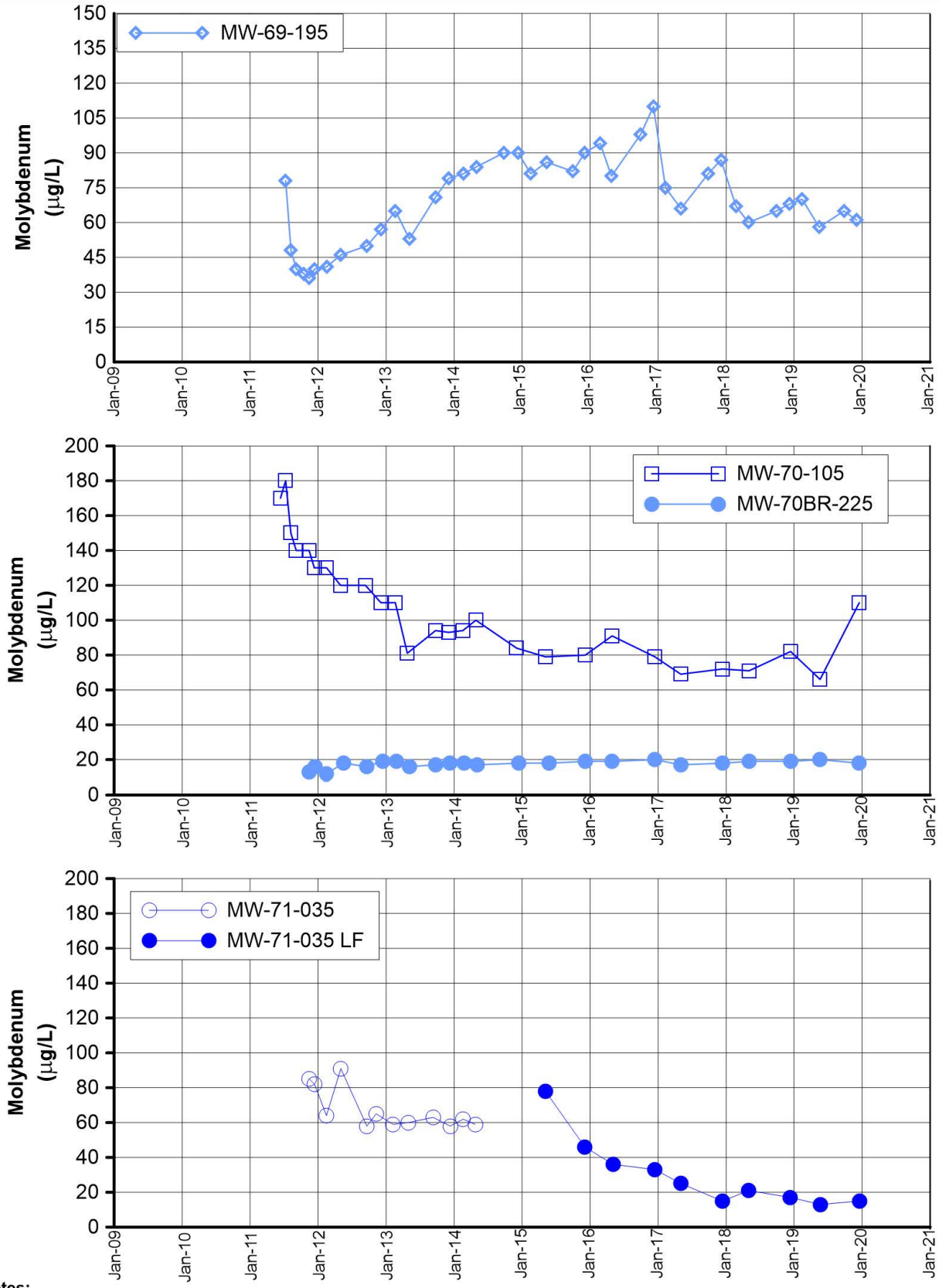


Notes:

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 F-35
MOLYBDENUM
IN MW-66, MW-67, AND MW-68 CLUSTERS
FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS



Notes:

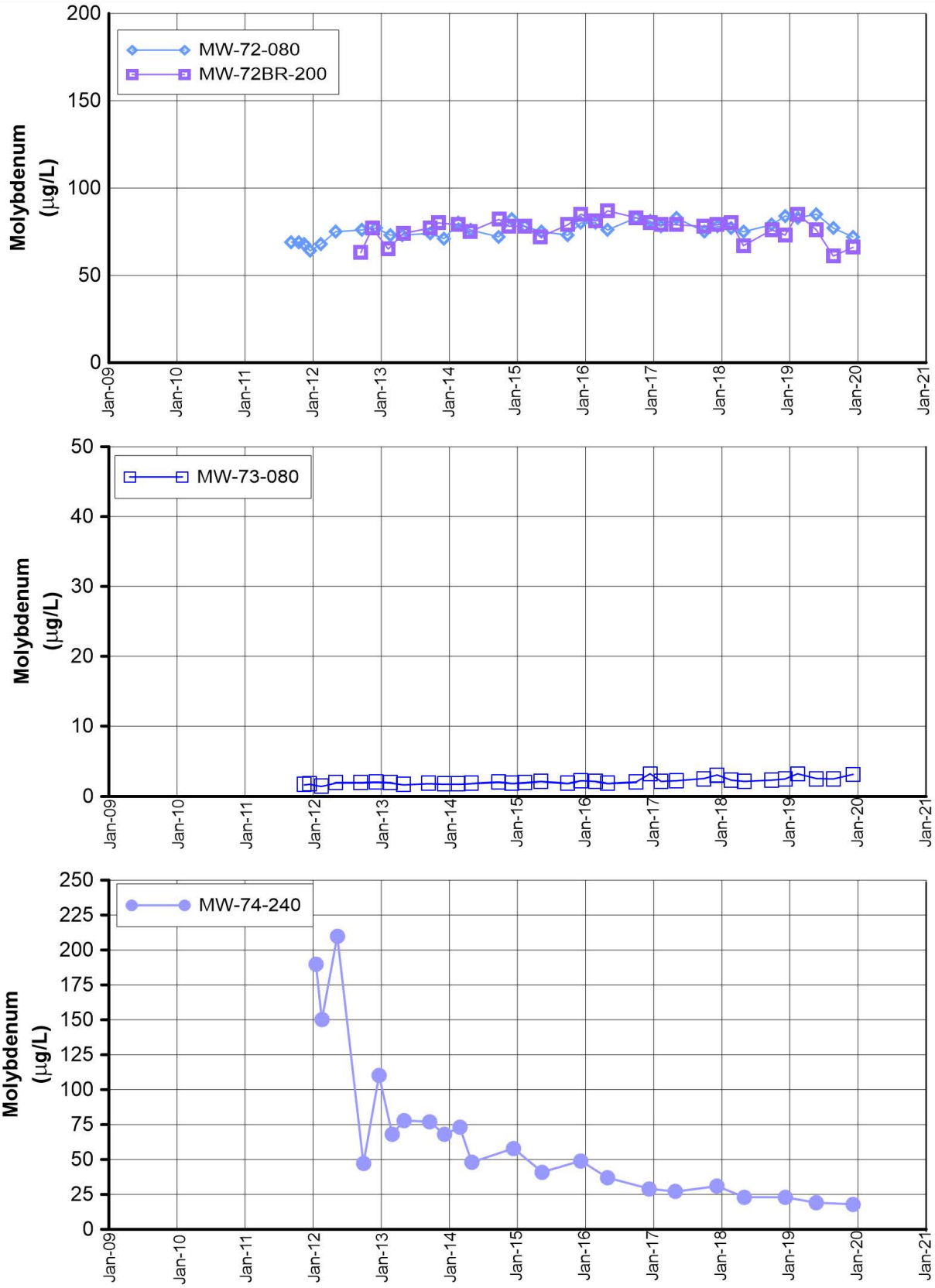
LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

1. MW-69-195 sampled using LF method on 2/09/2017, 5/03/2017, 9/26/2017, & 12/04/2017.
2. MW-70-105 sampled using LF method on 5/02/2017 & 12/11/2017.

FIGURE F-36
MOLYBDENUM
IN MW-69-195, THE MW-70 CLUSTER, AND MW-71-035
FOURTH QUARTER 2019 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\17_Q419



Notes:

1. MW-72-080 sampled using low flow sampling method on 5/02/2017 & 12/07/2017.
2. MW-73-080 sampled using low flow sampling method on 5/02/2017, 9/27/2017, & 12/06/2017.
3. MW-74-240 sampled using low flow sampling method on 4/27/2017 & 12/06/2017.

FIGURE F-37
MOLYBDENUM
IN MW-72 CLUSTER, MW-73-080, AND MW-74-240
FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS

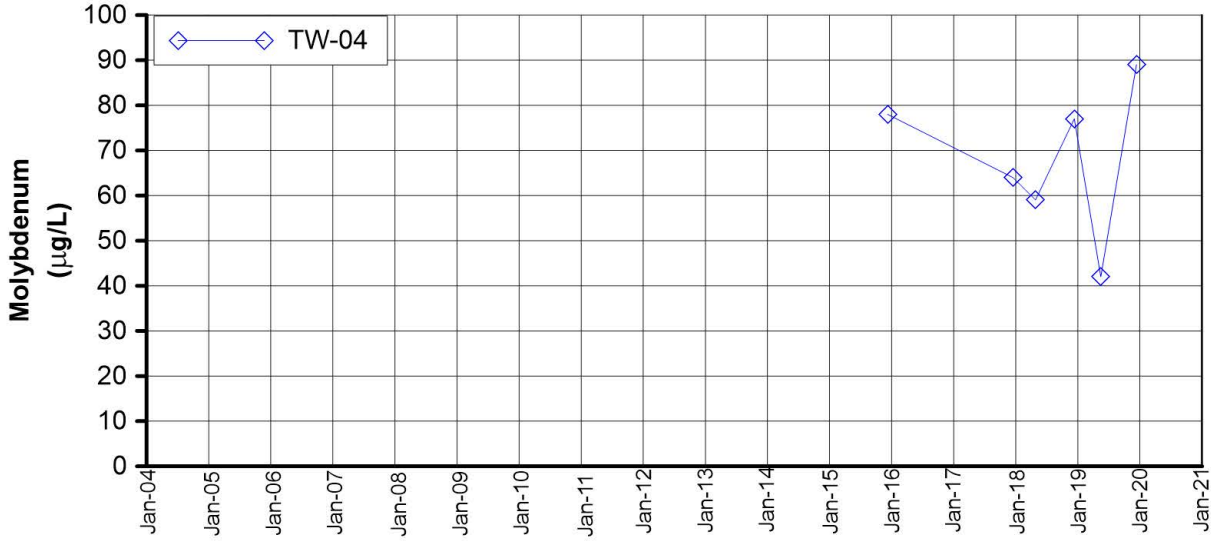
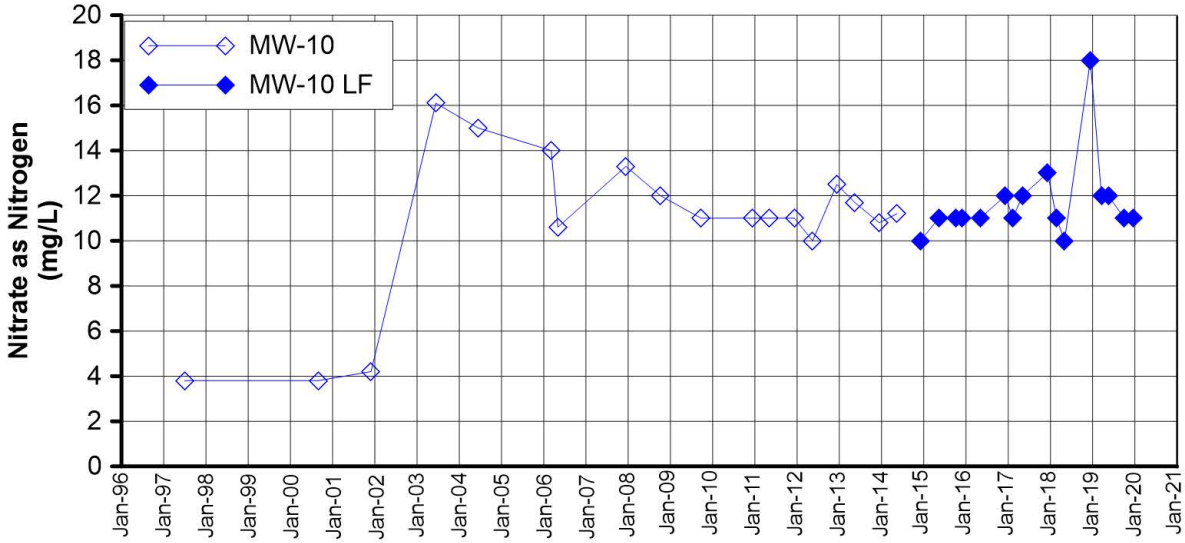
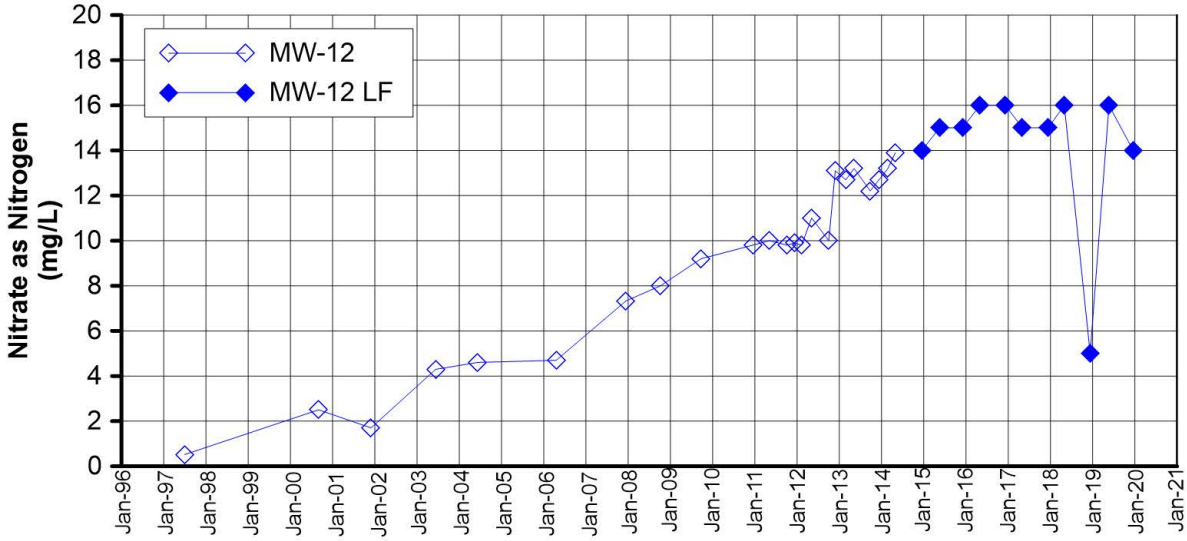


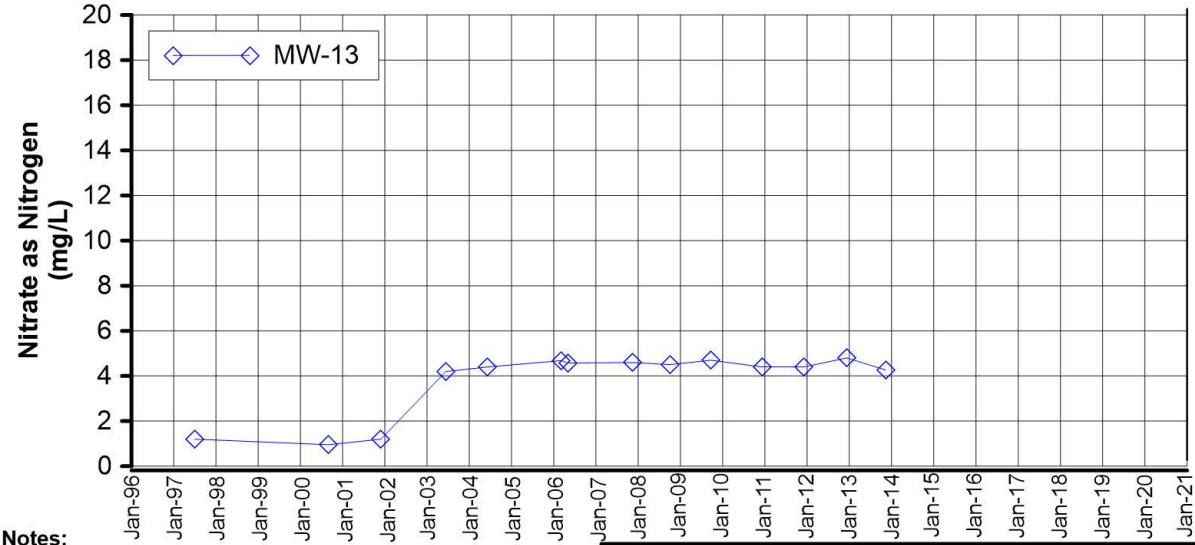
FIGURE F-38
MOLYBDENUM
IN TW-04

FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS





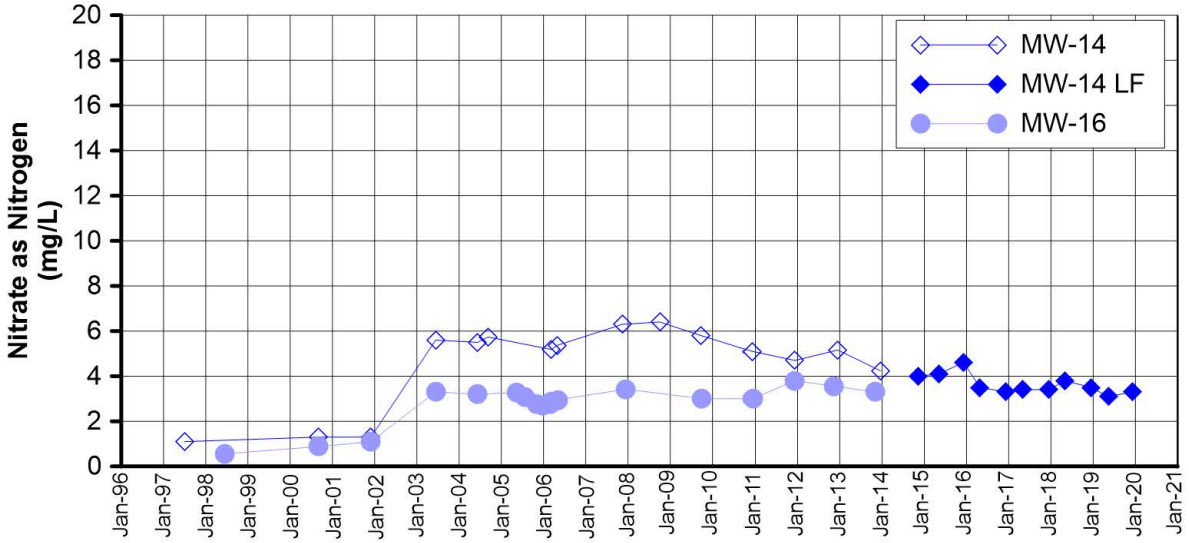


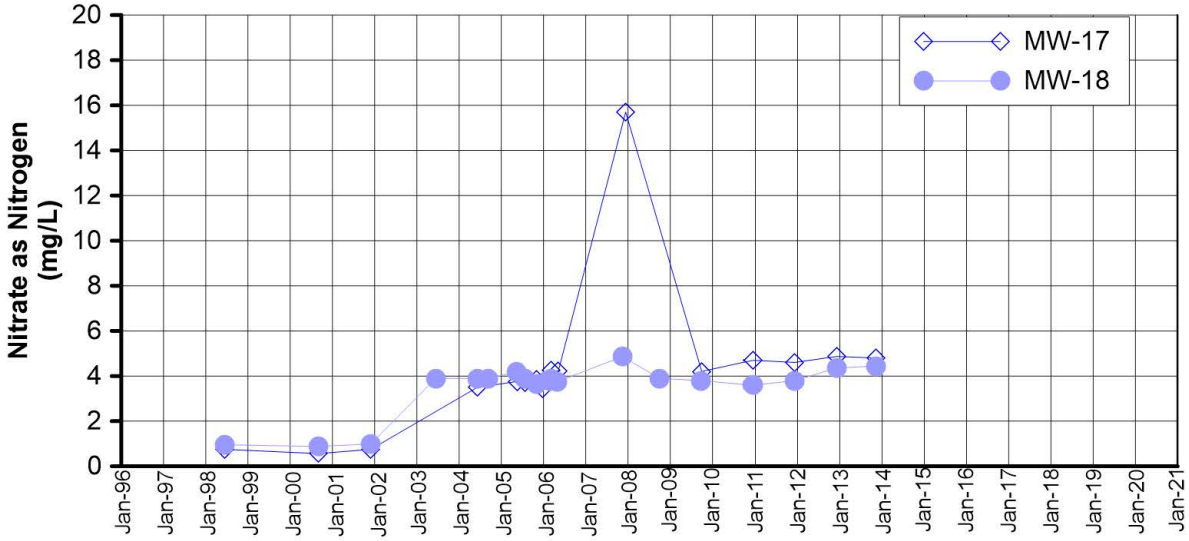
Notes:

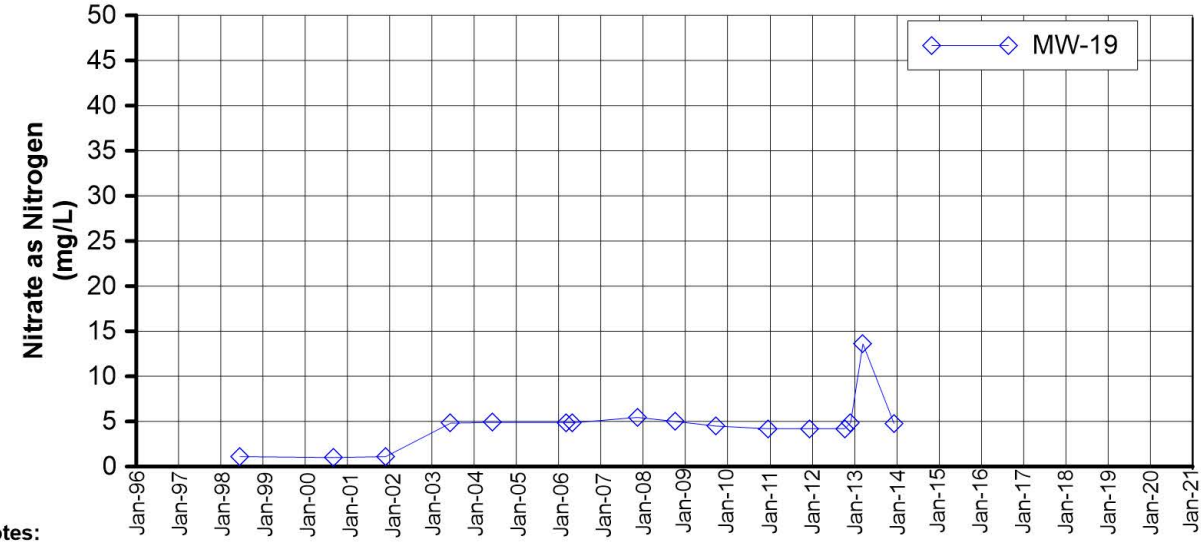
1. Starting in Fourth Quarter 2012 nitrate samples were analyzed using method USEPA 353.2, which reports a combination of nitrate and nitrite. The contribution of nitrite to the reported result of nitrate plus nitrite as nitrogen is expected to be negligible; therefore, sample results for method USEPA 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 F-39
NITRATE as NITROGEN
IN MW-10, MW-12, AND MW-13
FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS





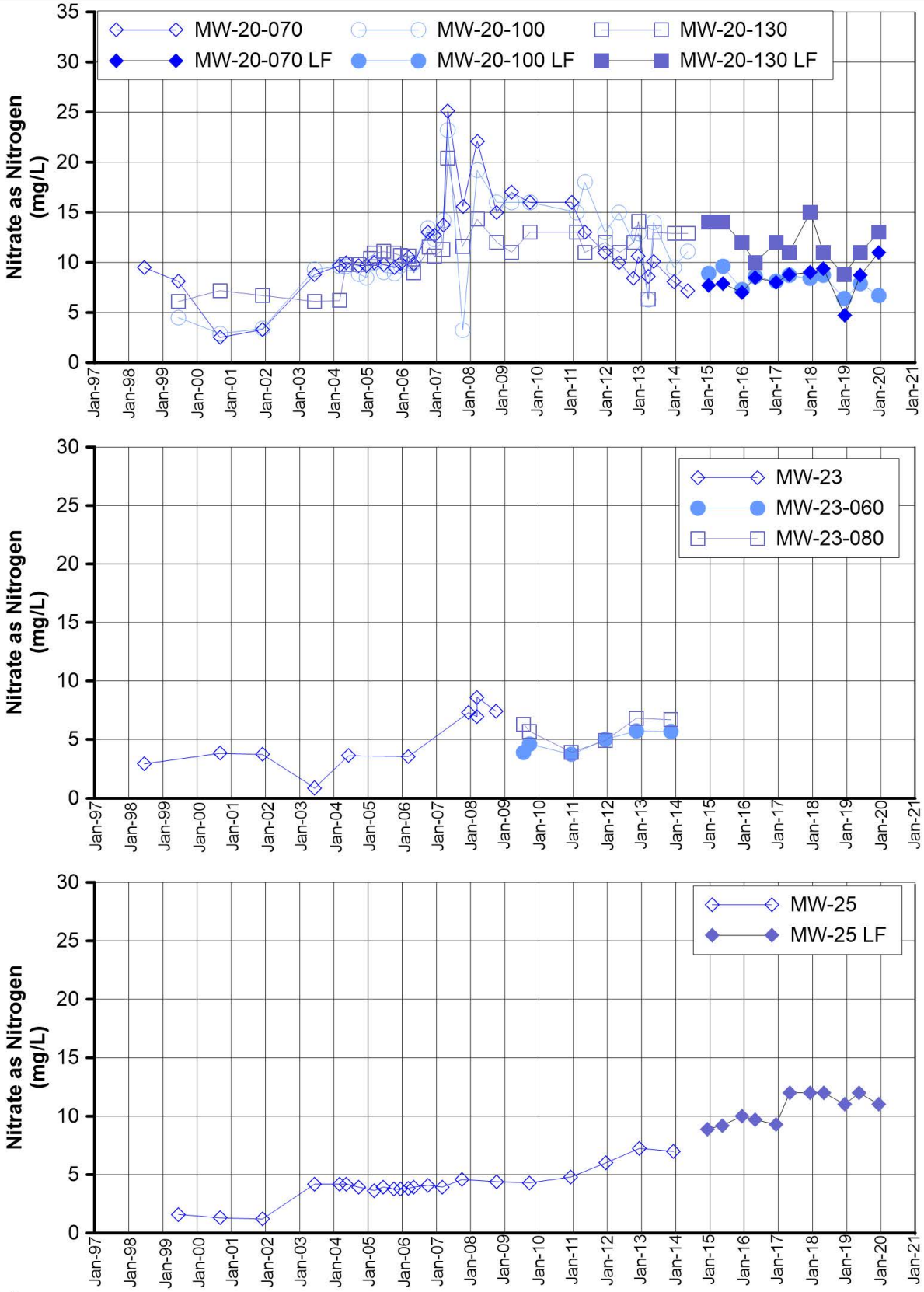


Notes:

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 F-40
NITRATE as NITROGEN
IN MW-14, MW-16, MW-17, MW-18, AND MW-19
FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS

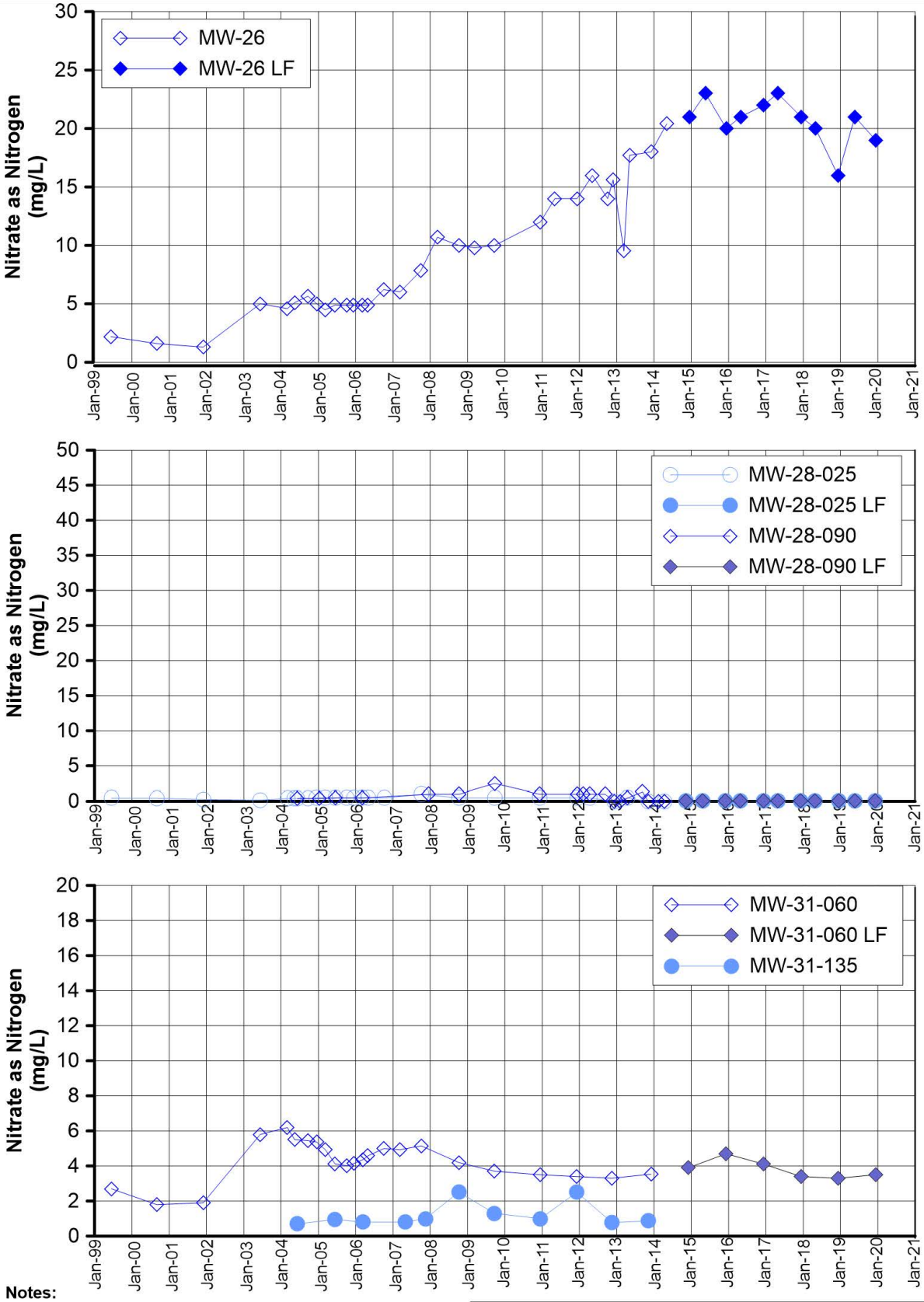


Notes:

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 F-41
NITRATE as NITROGEN
IN MW-20, MW-23, AND MW-25 CLUSTERS
FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS

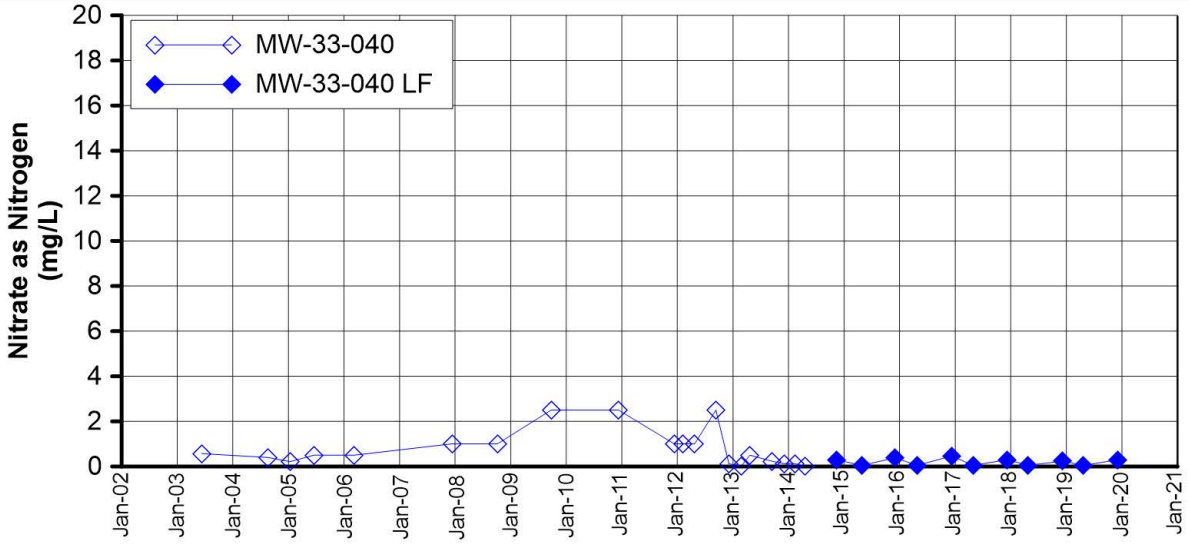


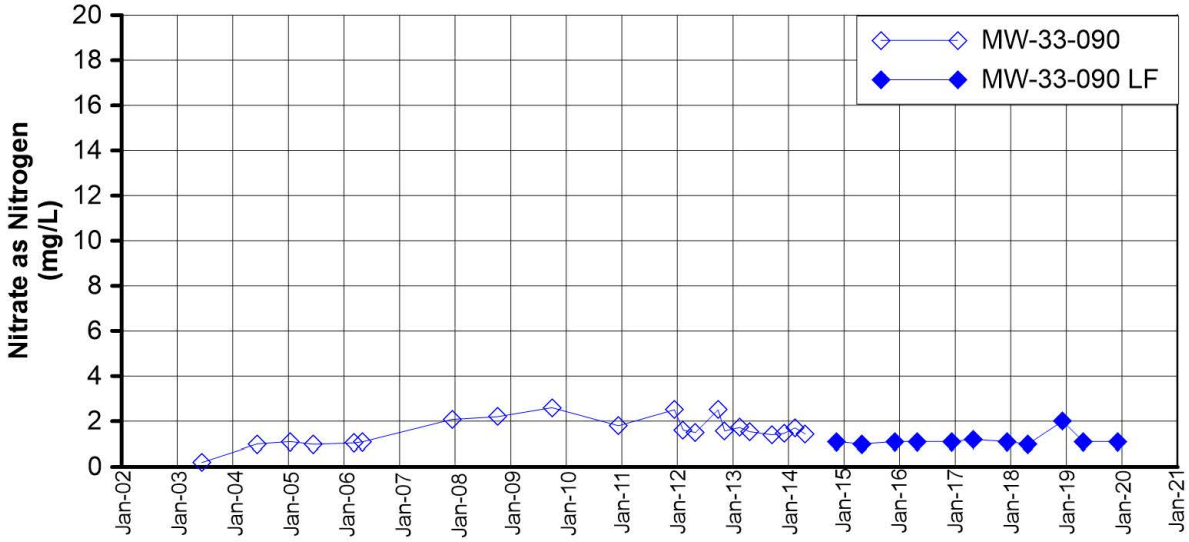
Notes:

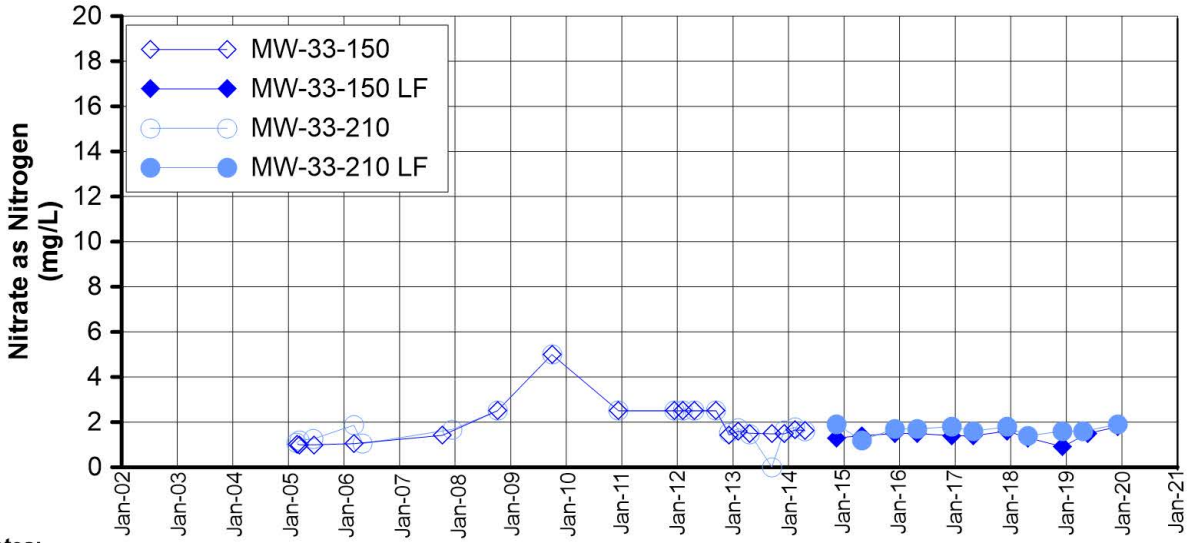
1. Starting in Fourth Quarter 2012 nitrate samples were analyzed using method USEPA 353.2, which reports a combination of nitrate and nitrite. The contribution of nitrite to the reported result of nitrate plus nitrite as nitrogen is expected to be negligible; therefore, sample results for method USEPA 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 F-42
NITRATE as NITROGEN
IN MW-26, MW-28, AND MW-31 CLUSTERS
FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS







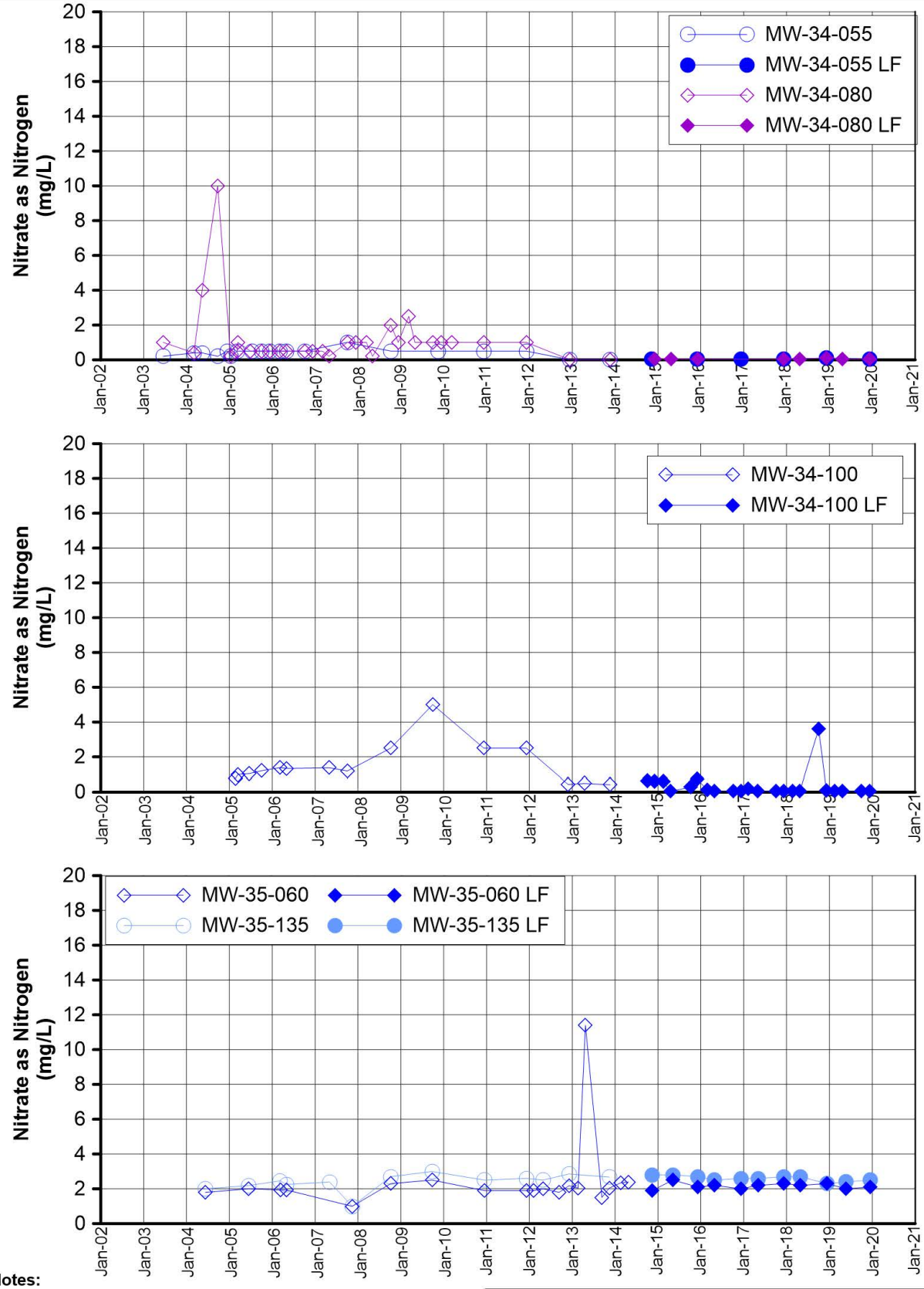
Notes:

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 F-43
NITRATE as NITROGEN
IN MW-33 CLUSTER

ARCADIS

FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

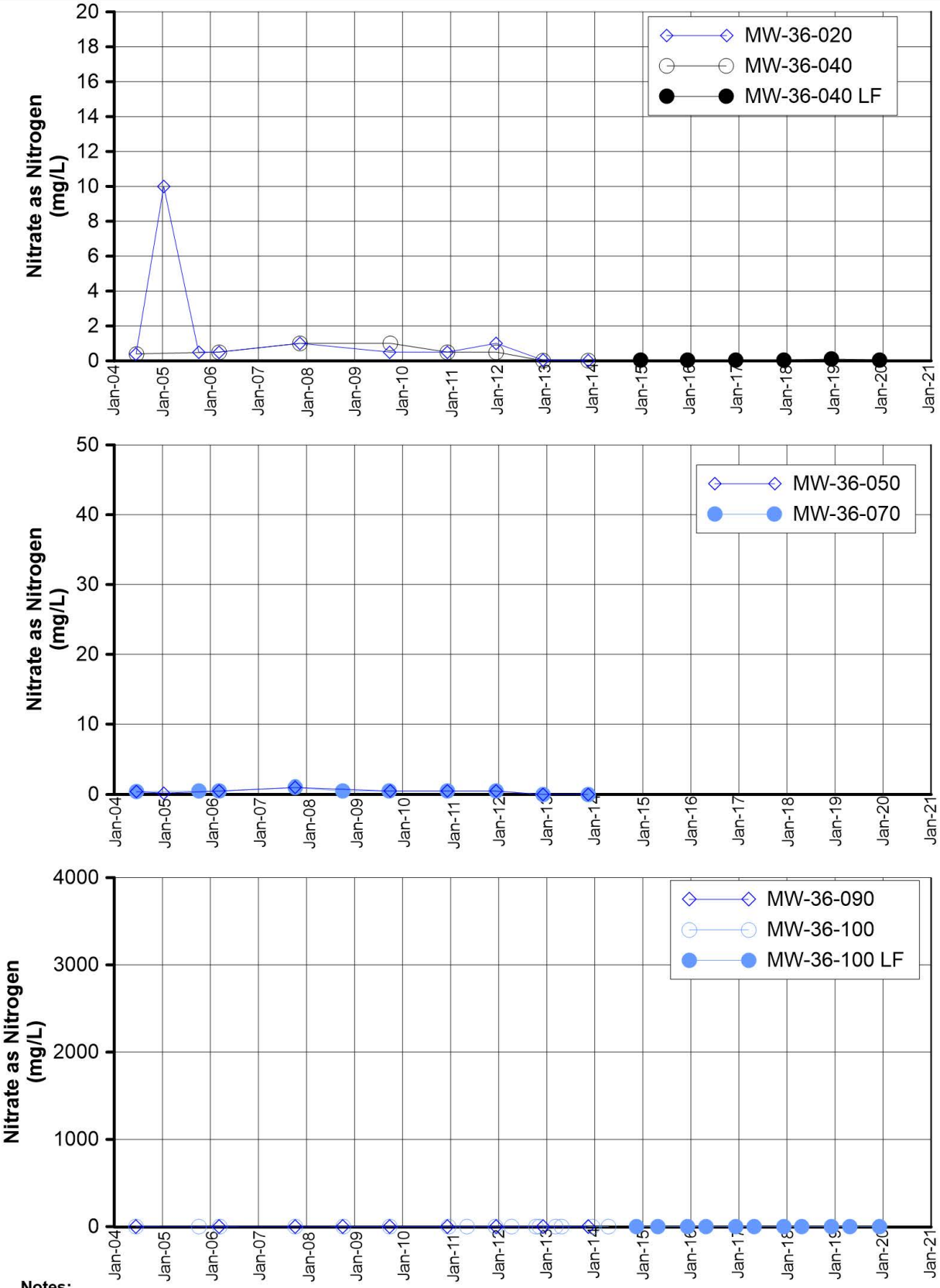


Notes:

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 F-44
NITRATE as NITROGEN
IN MW-34 AND MW-35 CLUSTERS
FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS



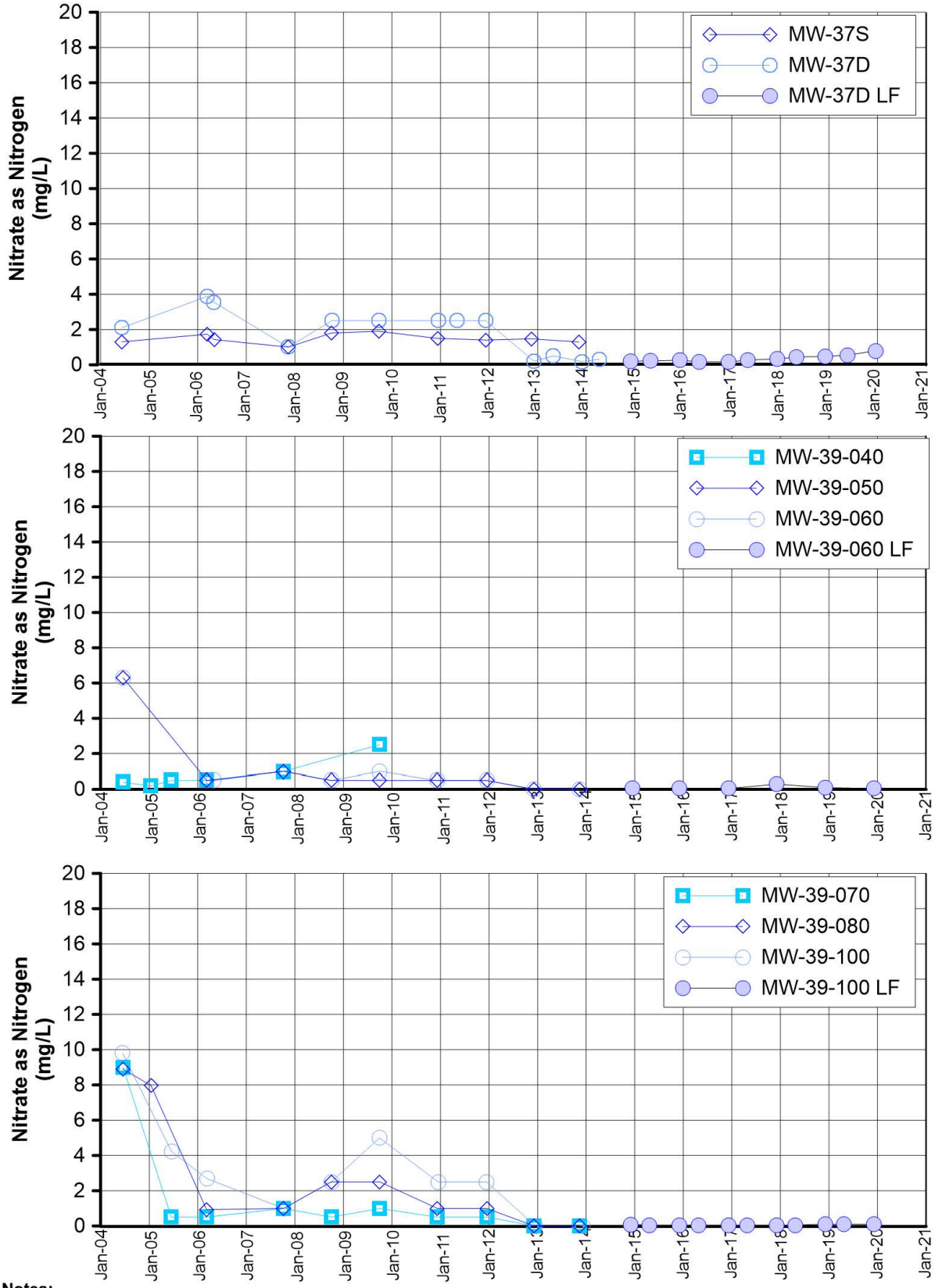
Notes:

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 F-45
NITRATE as NITROGEN
IN MW-36 CLUSTER

FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS



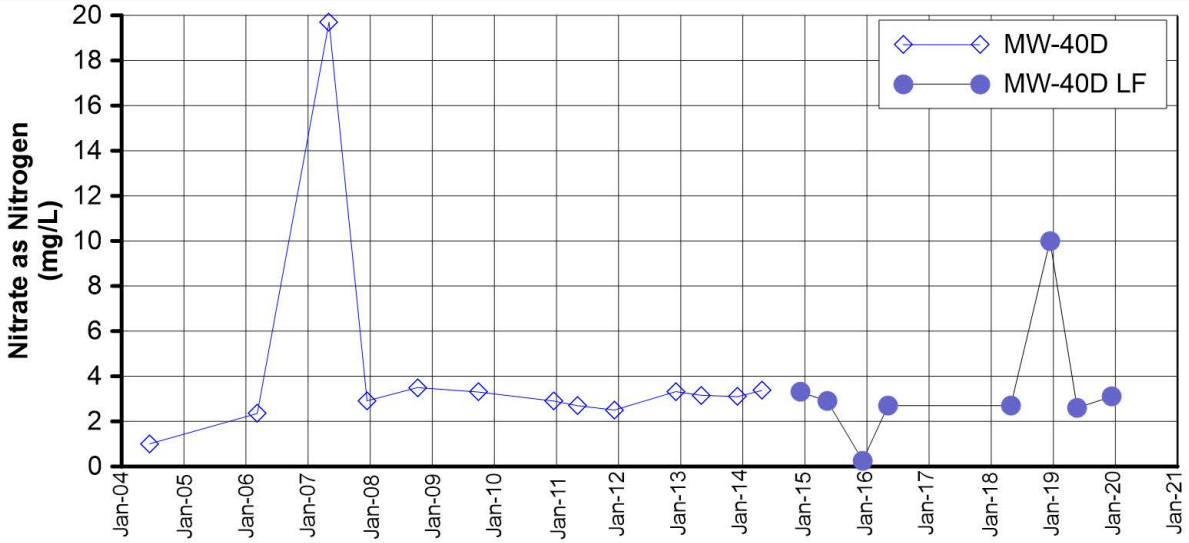
Notes:

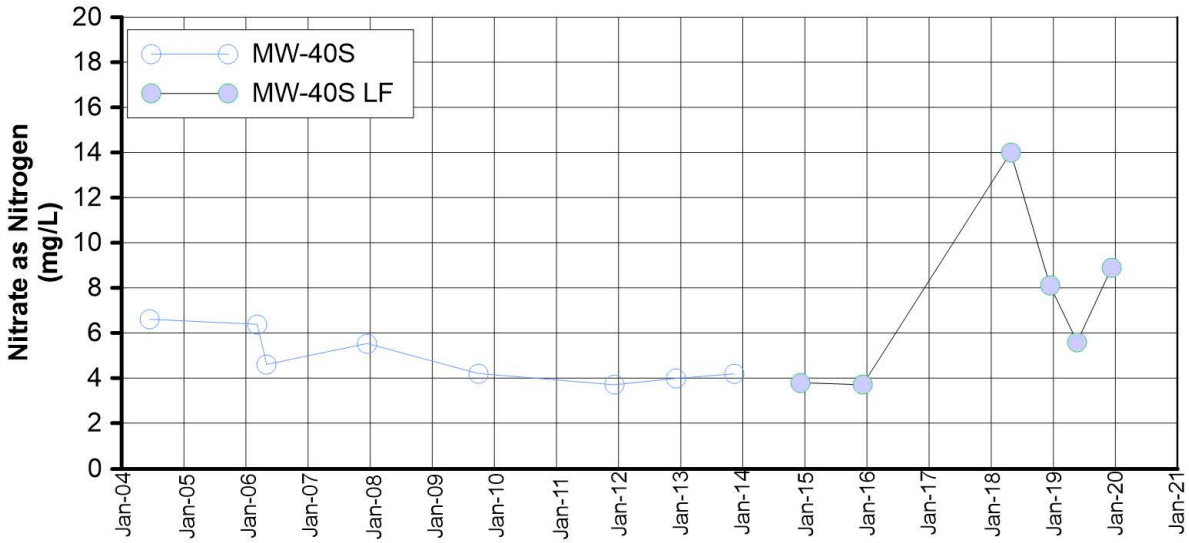
1. Starting in Fourth Quarter 2012 nitrate samples were analyzed using method USEPA 353.2, which reports a combination of nitrate and nitrite. The contribution of nitrite to the reported result of nitrate plus nitrite as nitrogen is expected to be negligible; therefore, sample results for method USEPA 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.

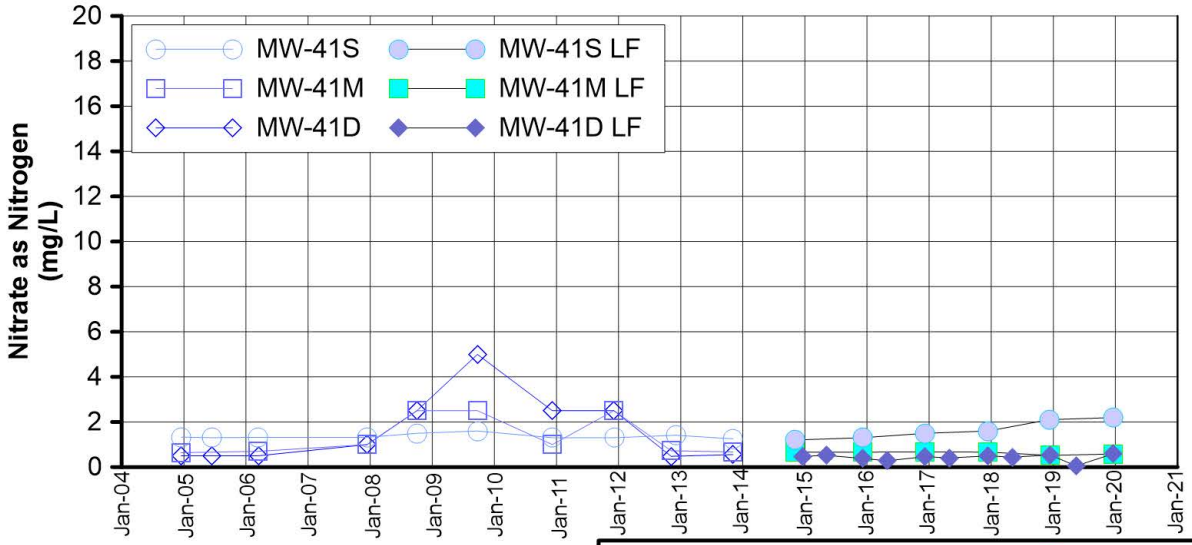
FIGURE F-46
NITRATE as NITROGEN
IN MW-37 AND MW-39 CLUSTERS
FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS

\\arcadis-us.com\officedata\Denver-CO-Technical\Aproject\PG&E - Groundwater Monitoring\Reporting\00_Arcadis_rpts\02_GMP_rpts\17_Q419







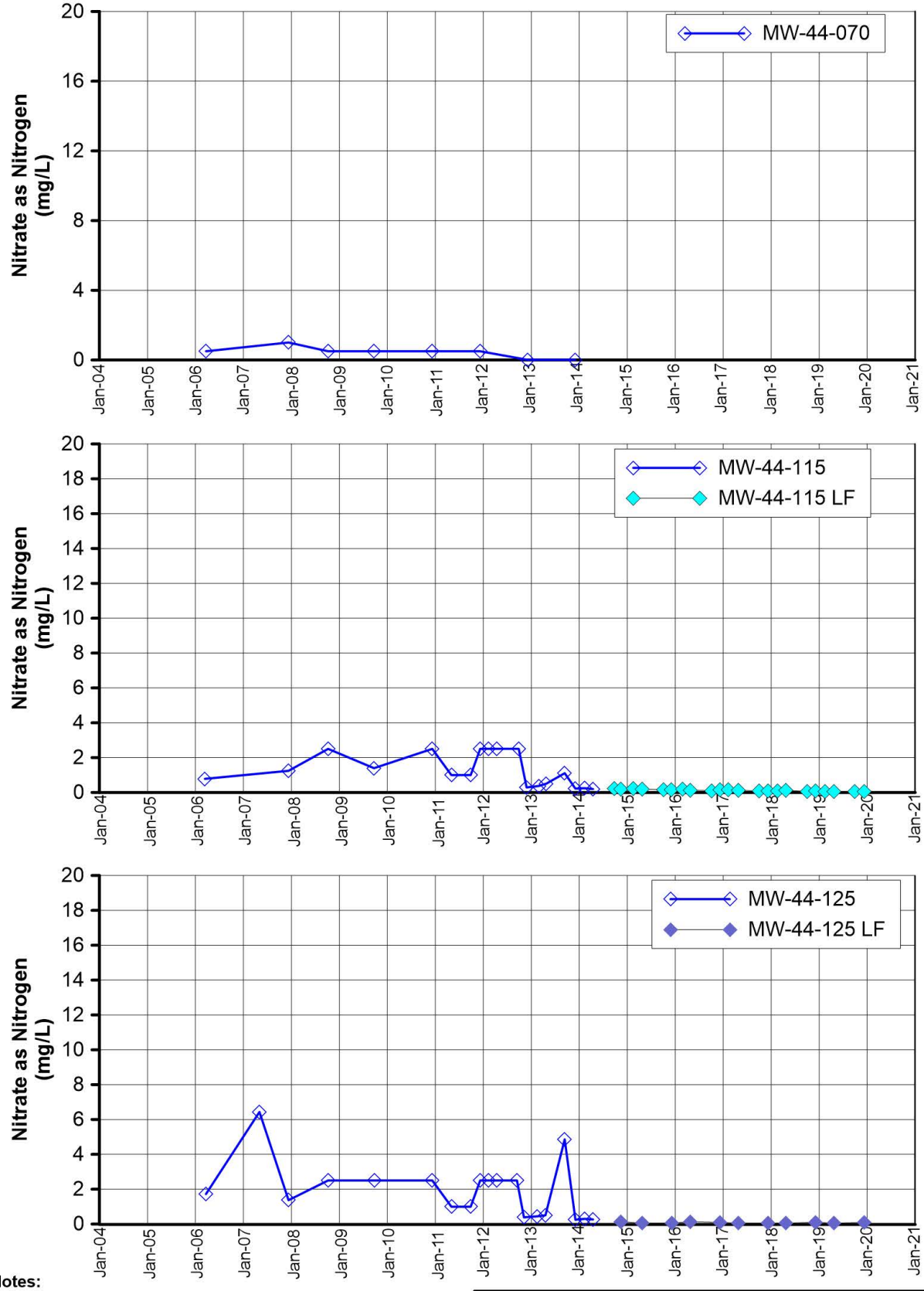
Notes:

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 2017 due to traffic control issues.

FIGURE F-47
NITRATE as NITROGEN
IN MW-40 AND MW-41 CLUSTERS
FOURTH QUARTER 2019 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\17_Q419



Notes:

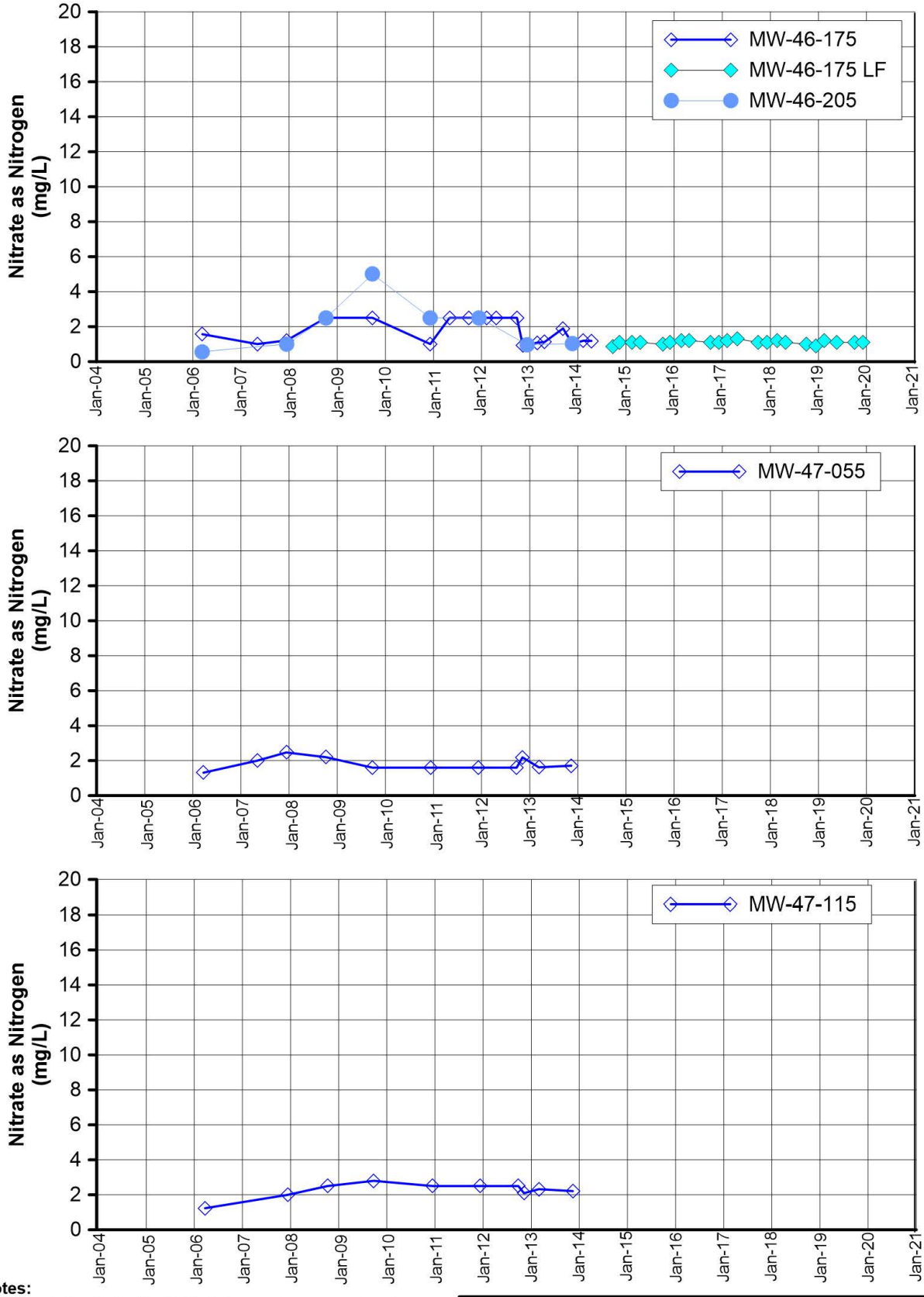
1. Starting in Fourth Quarter 2012 nitrate samples were analyzed using method USEPA 353.2, which reports a combination of nitrate and nitrite. The contribution of nitrite to the reported result of nitrate plus nitrite as nitrogen is expected to be negligible; therefore, sample results for method USEPA 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 F-48
NITRATE as NITROGEN
IN MW-44 CLUSTER

FOURTH QUARTER 2019 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\17_Q419



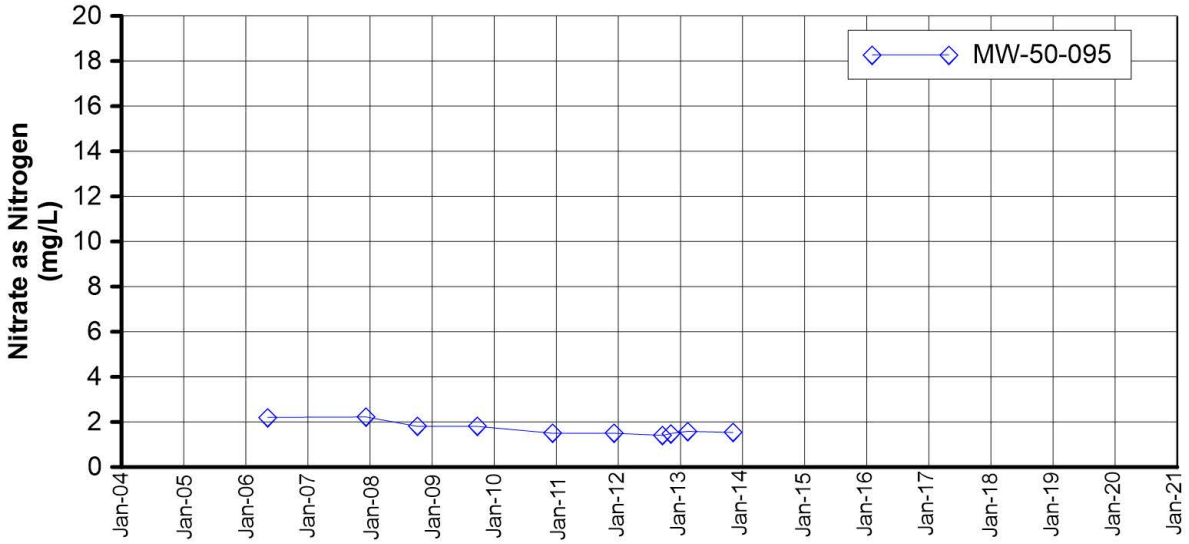
Notes:

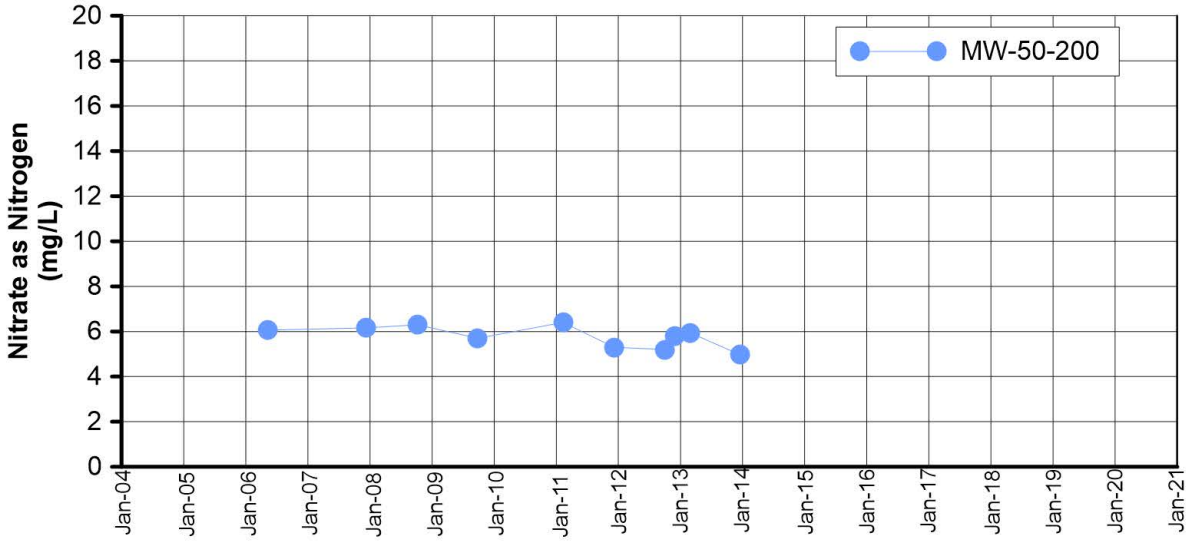
1. Starting in Fourth Quarter 2012 nitrate samples were analyzed using method USEPA 353.2, which reports a combination of nitrate and nitrite. The contribution of nitrite to the reported result of nitrate plus nitrite as nitrogen is expected to be negligible; therefore, sample results for method USEPA 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.

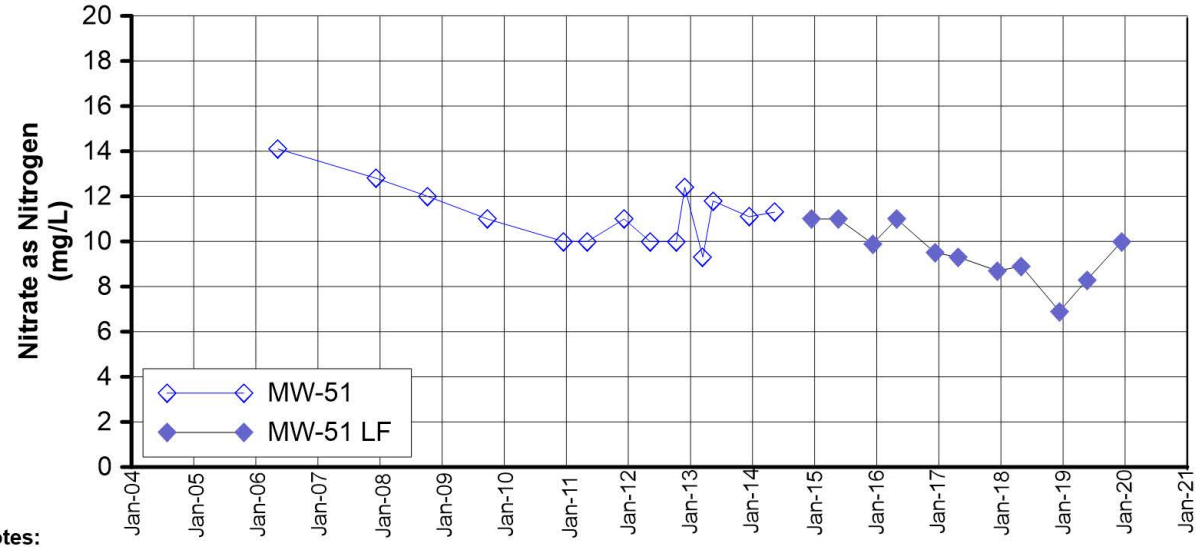
FIGURE F-49
NITRATE as NITROGEN
IN MW-46 AND MW-47 CLUSTERS
FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS

\\arcadis-us.com\officedata\Denver-CO-Technical\Aproject\PG&E - Groundwater Monitoring\Reporting\00_Arcadis_rpts\02_GMP_rpts\17_Q419





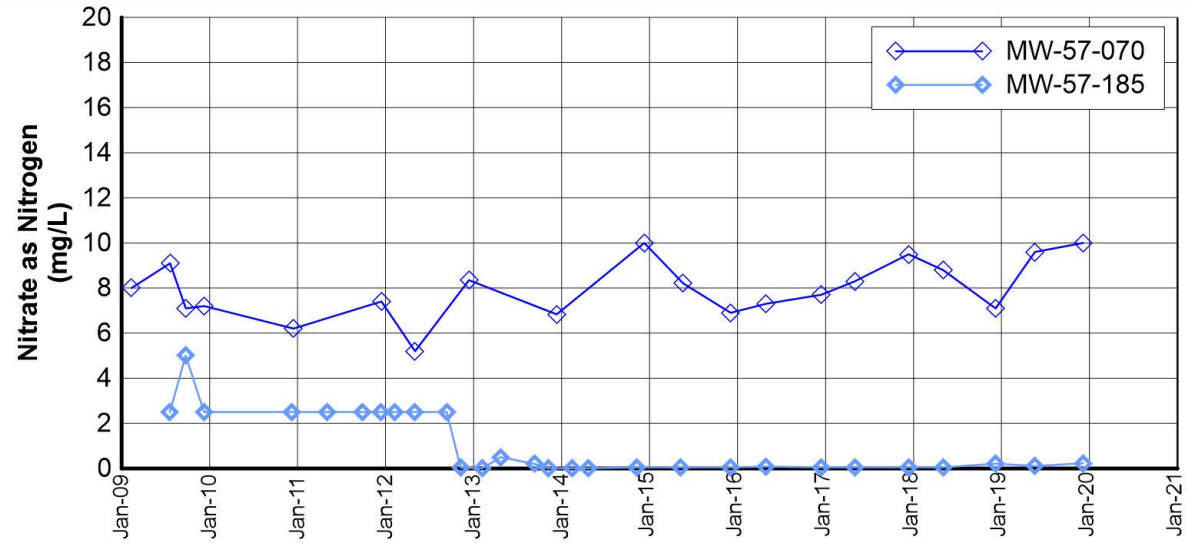


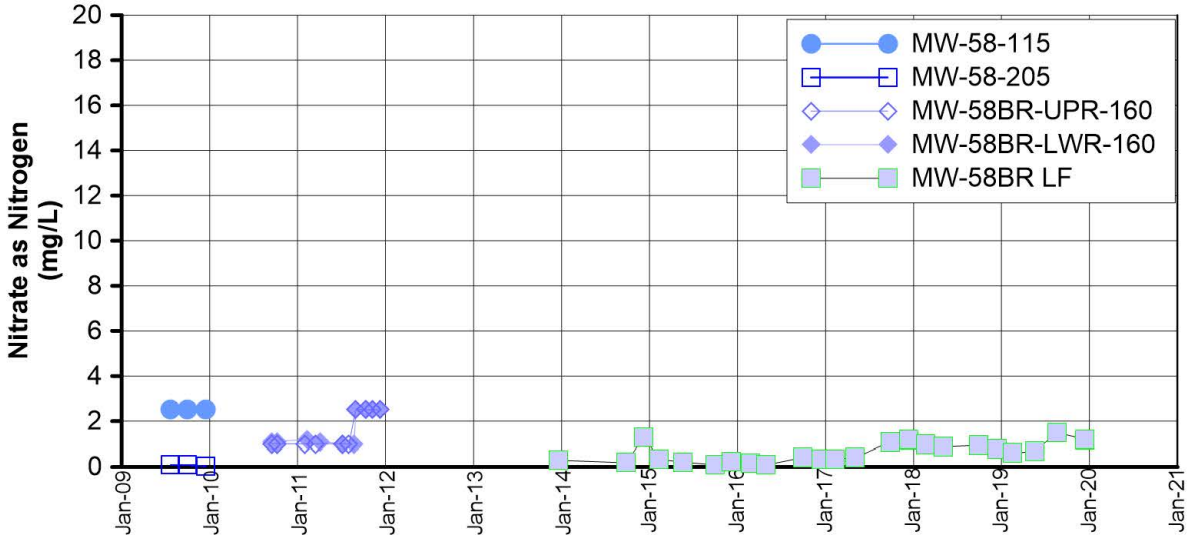
Notes:

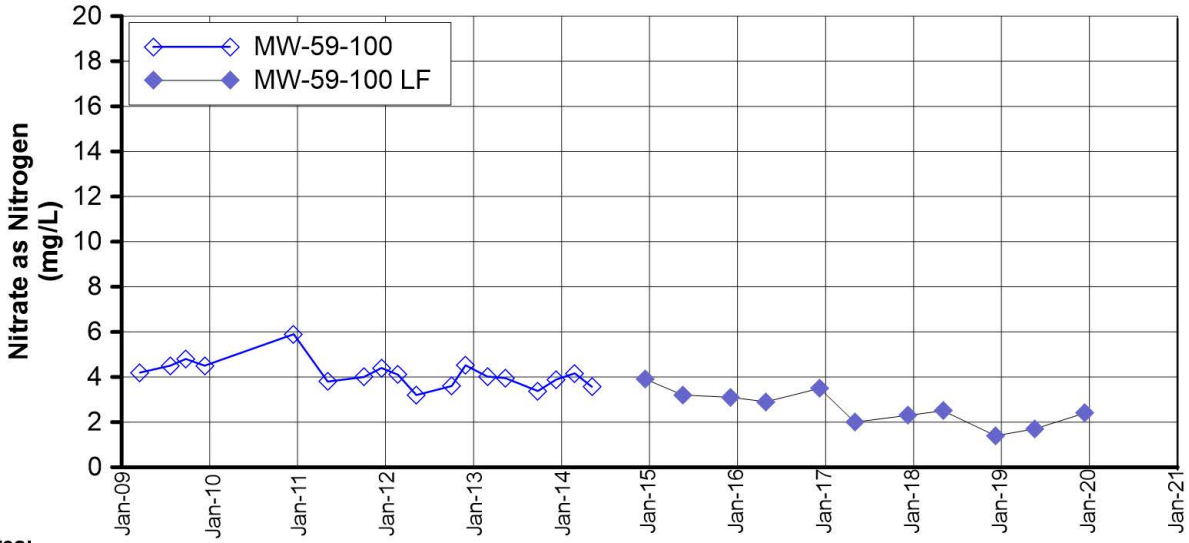
1. Starting in Fourth Quarter 2012 nitrate samples were analyzed using method USEPA 353.2, which reports a combination of nitrate and nitrite. The contribution of nitrite to the reported result of nitrate plus nitrite as nitrogen is expected to be negligible; therefore, sample results for method USEPA 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 F-50
NITRATE as NITROGEN
IN MW-50 AND MW-51 CLUSTERS
FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS





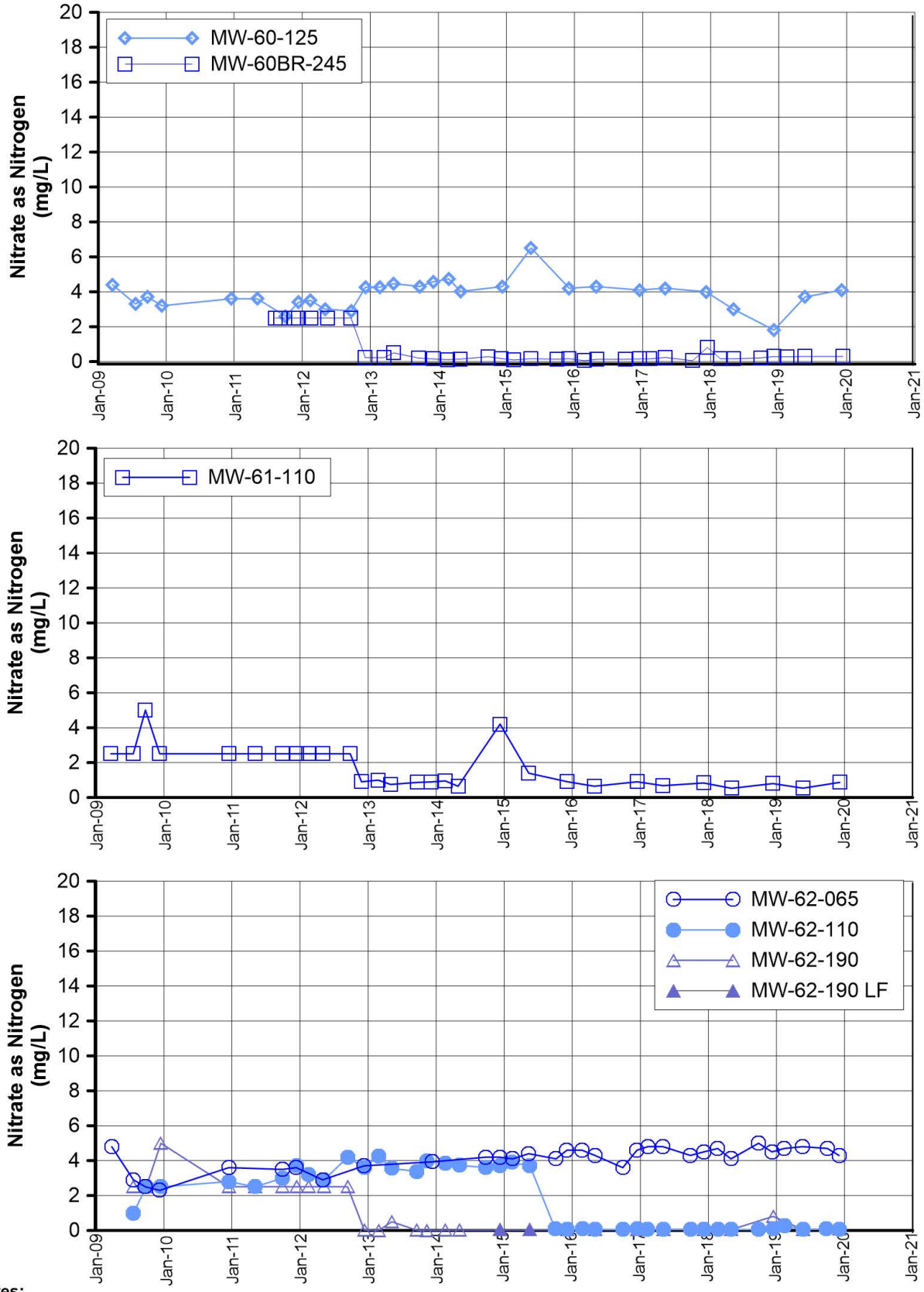


Notes:

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 F-51
NITRATE as NITROGEN
IN MW-57 CLUSTER, MW-58 CLUSTER AND MW-59-100
FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS



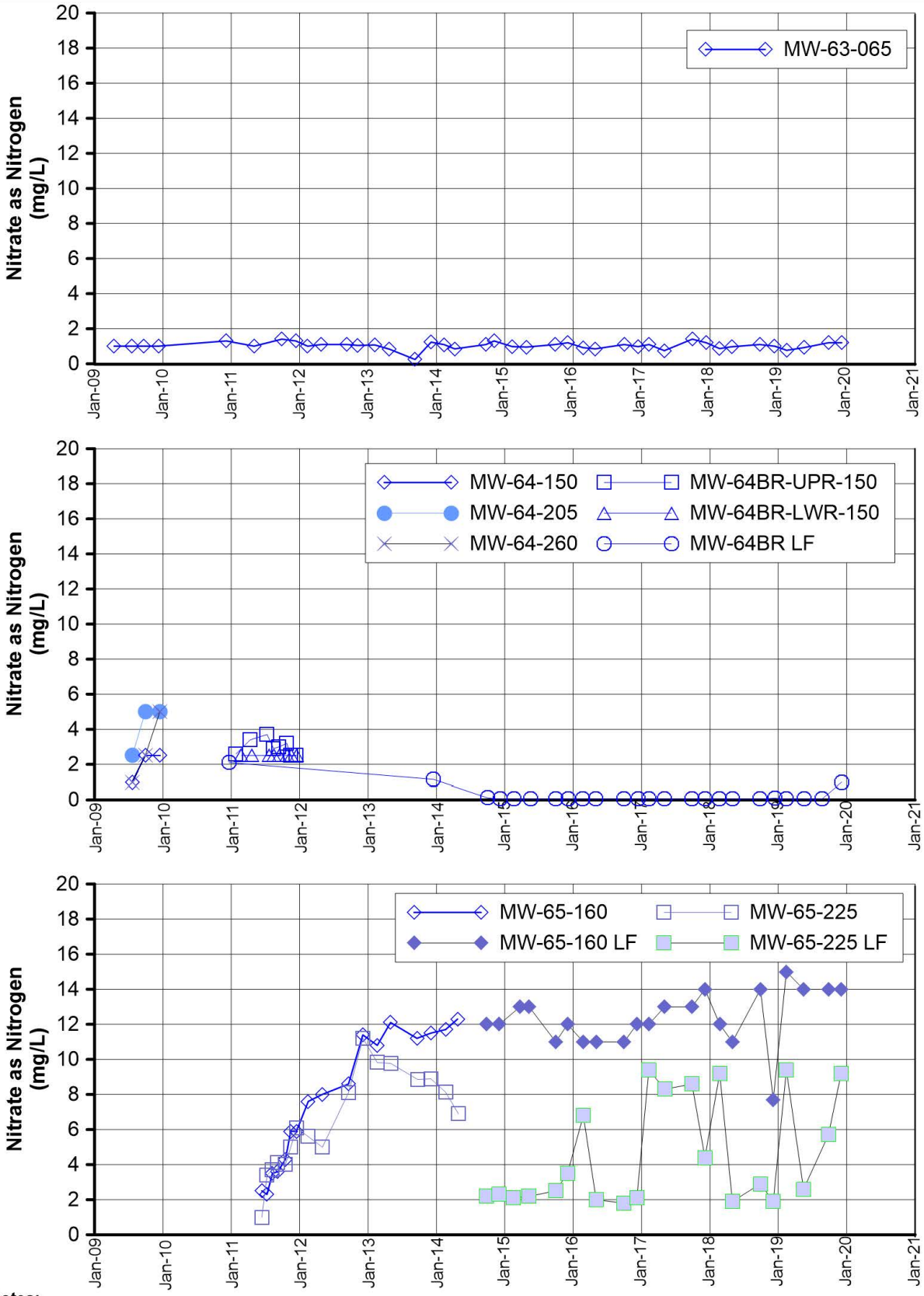
Notes:

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 F-52
NITRATE as NITROGEN
IN MW-60 CLUSTER, MW-61-110, AND MW-62 CLUSTER
FOURTH QUARTER 2019 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\17_Q419



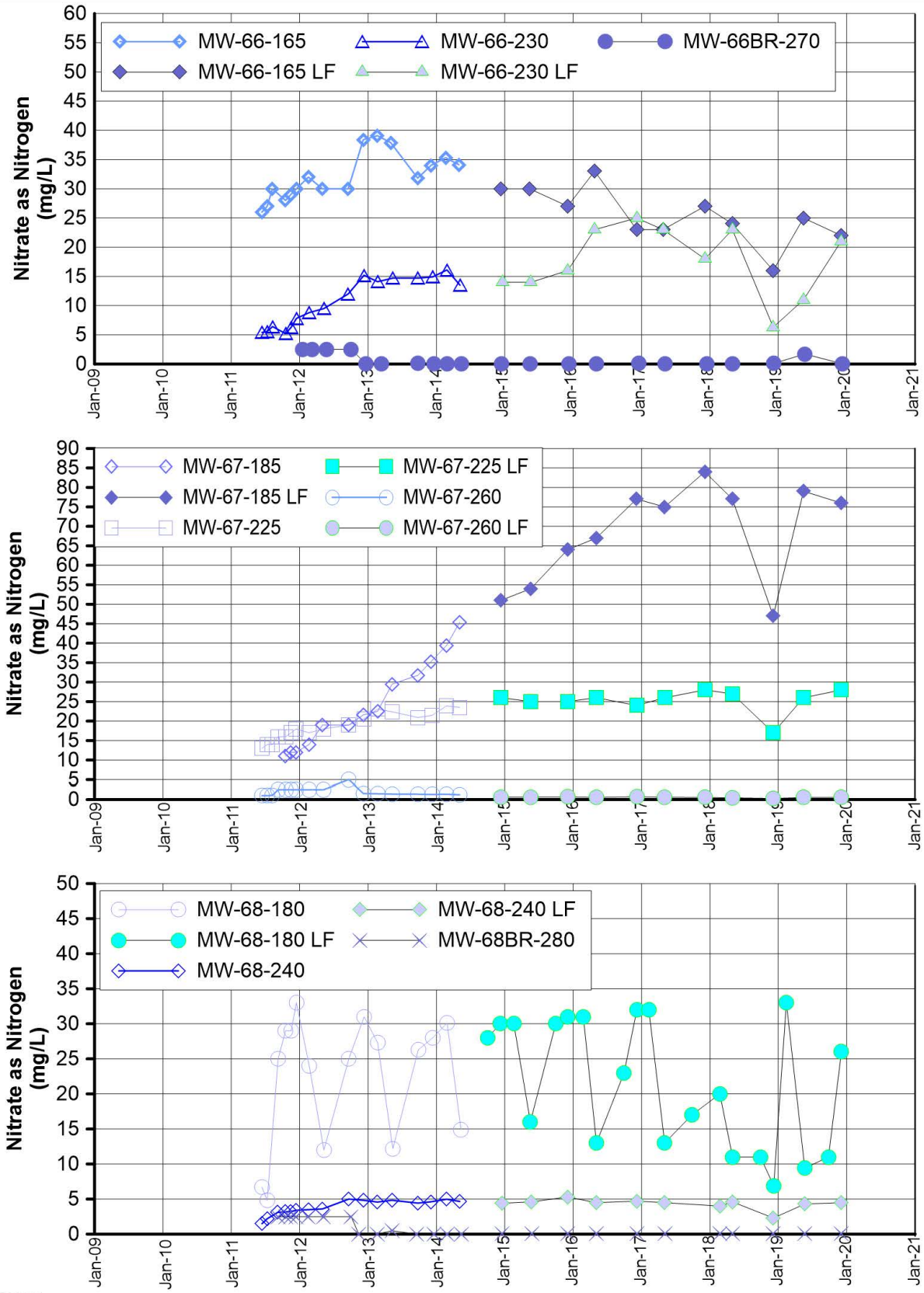
Notes:

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 F-53
NITRATE as NITROGEN
IN MW-63-065, MW-64 CLUSTER AND MW-65 CLUSTER
FOURTH QUARTER 2019 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\17_Q419



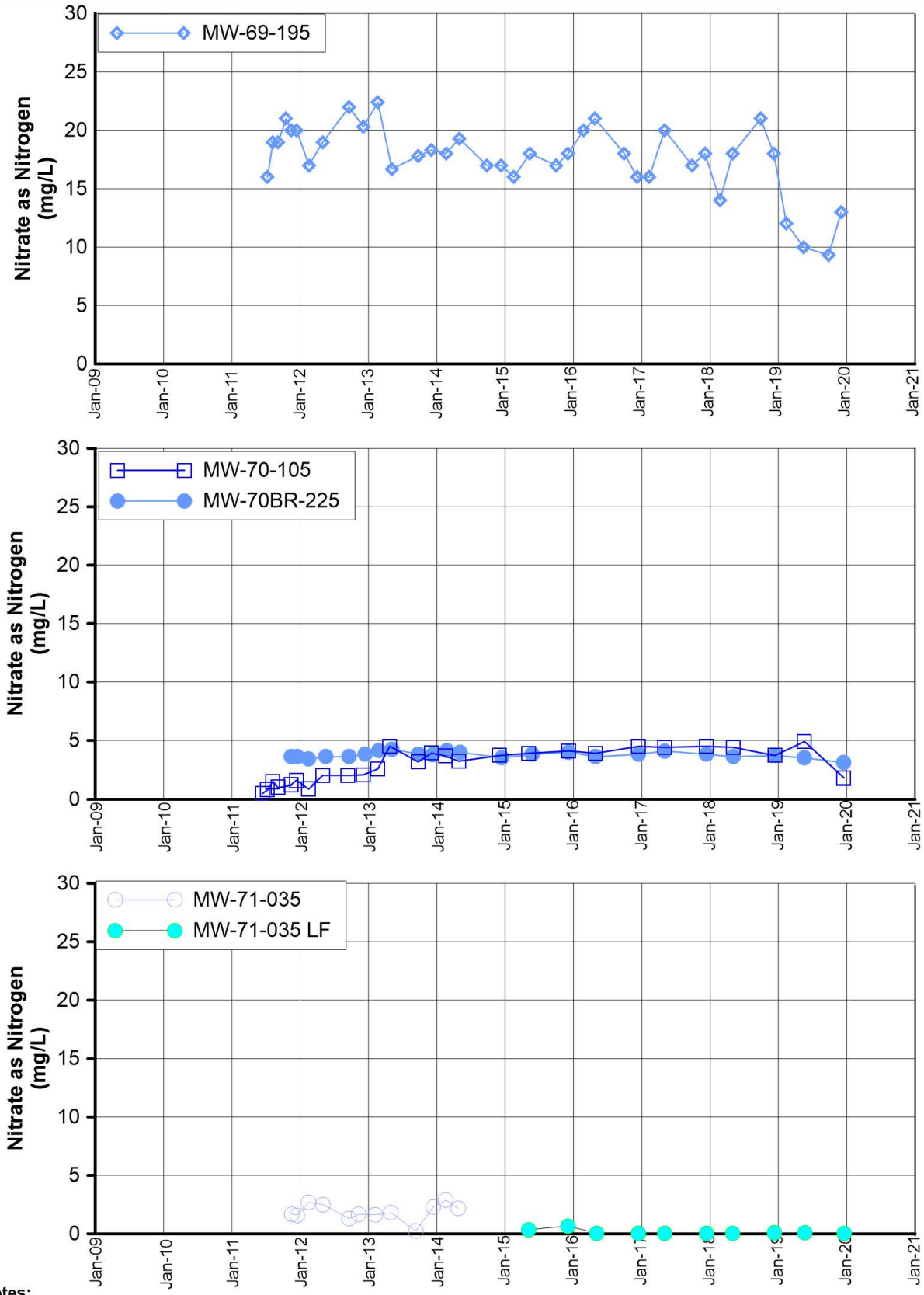
Notes:

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 F-54
NITRATE as NITROGEN
IN MW-66, MW-67, AND MW-68 CLUSTERS
FOURTH QUARTER 2019 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\17_Q419

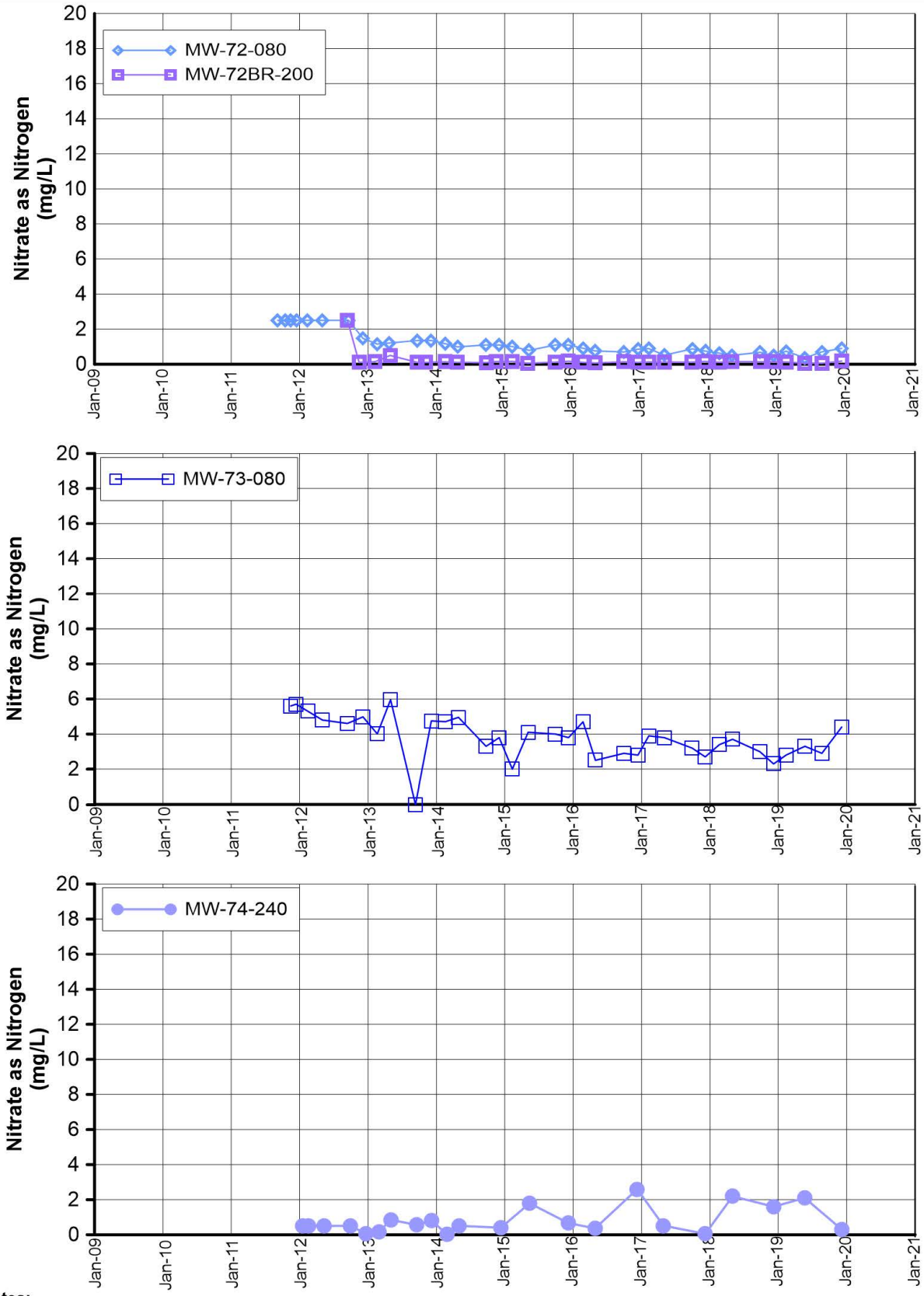


Notes:

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 F-55
NITRATE as NITROGEN
IN MW-69-195, THE MW-70 CLUSTER, AND MW-71-035
FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS

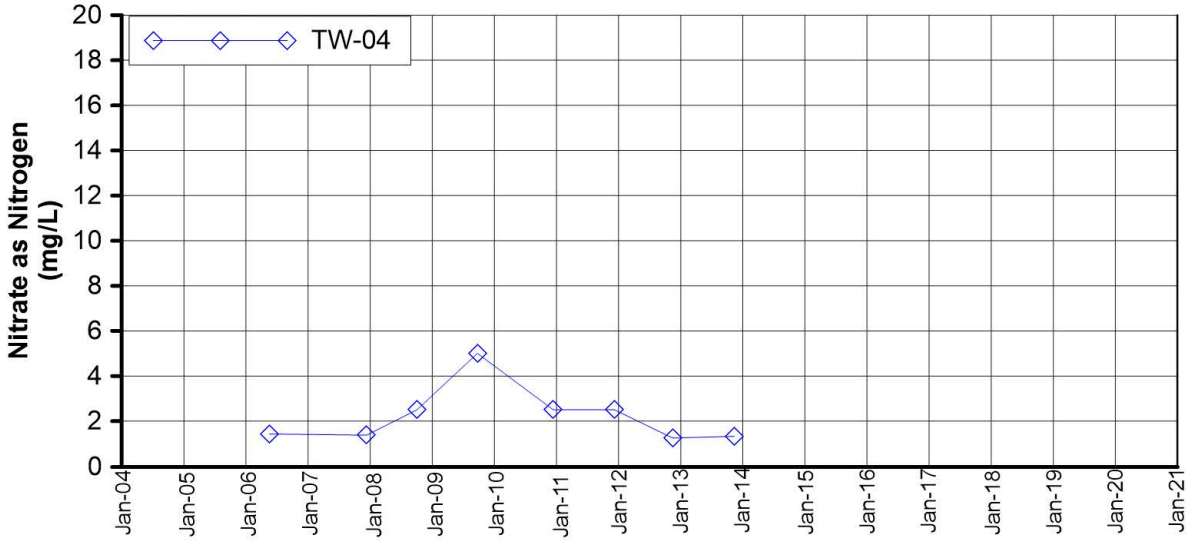


Notes:

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 F-56
NITRATE as NITROGEN
IN MW-72 CLUSTER, MW-73-080, AND MW-74-240
FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS



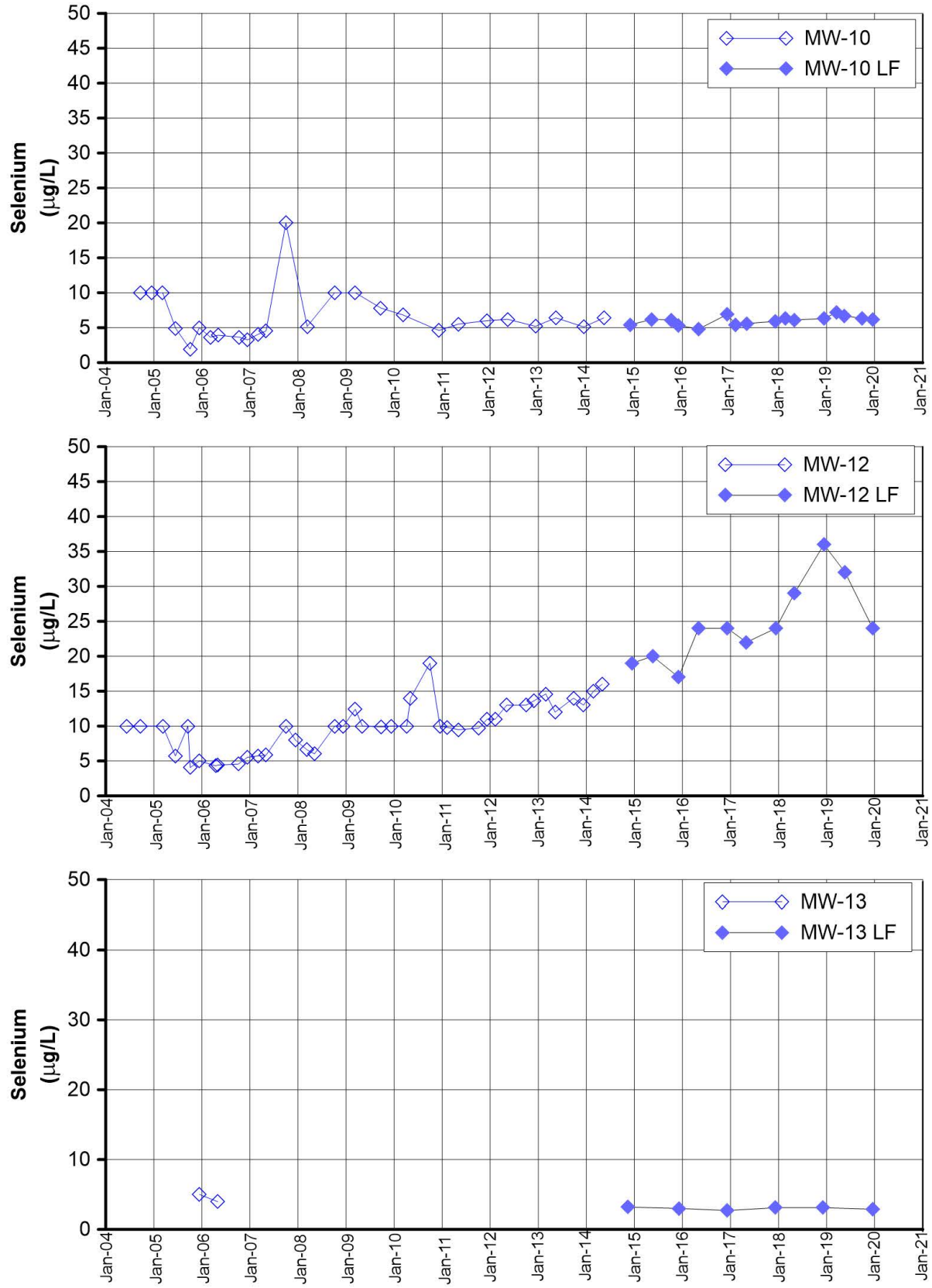
Notes:

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.

FIGURE F-57
NITRATE as NITROGEN IN TW-04

ARCADIS

FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

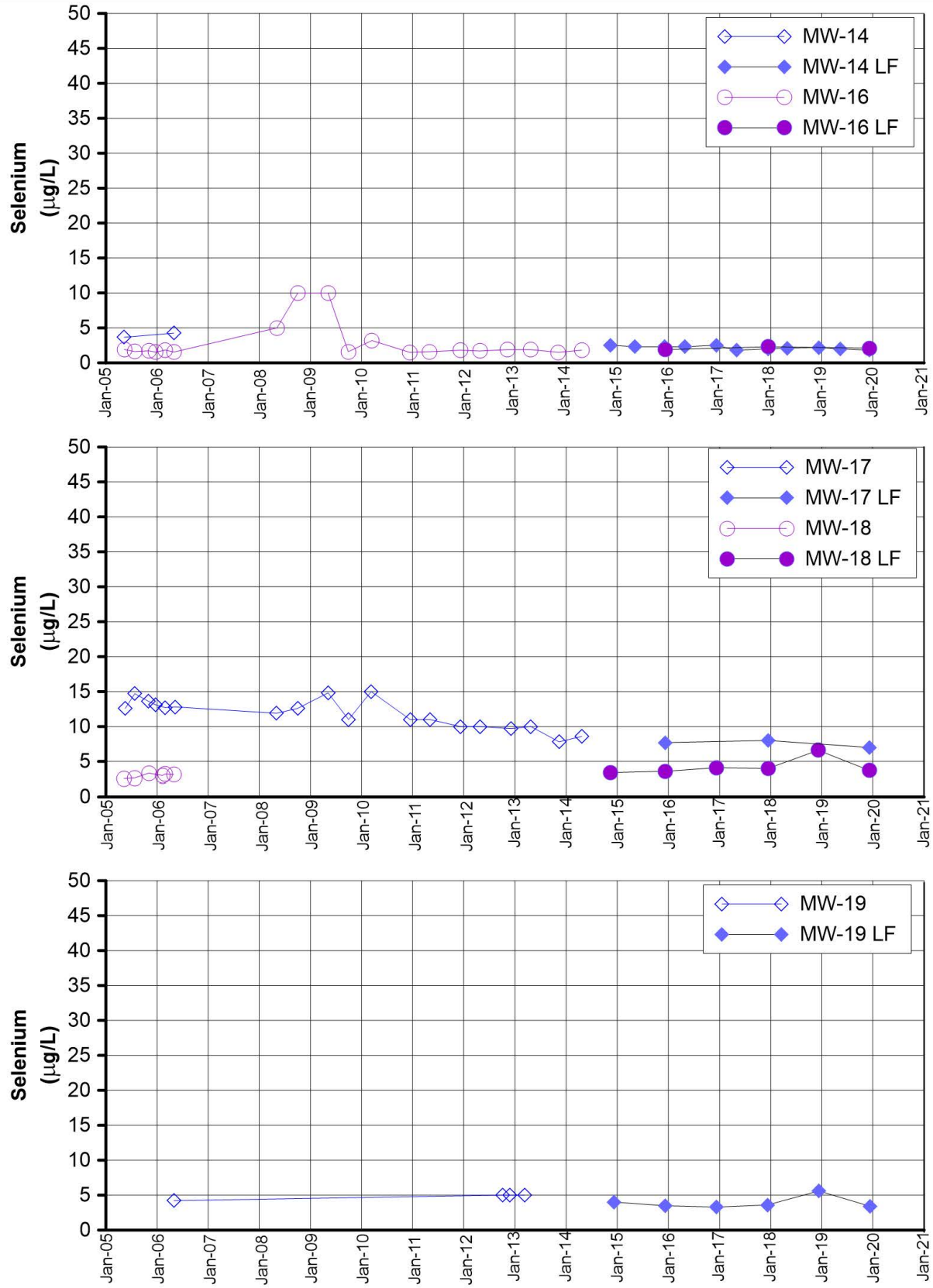


Notes:

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 F-58
SELENIUM
IN MW-10, MW-12, AND MW-13
FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS

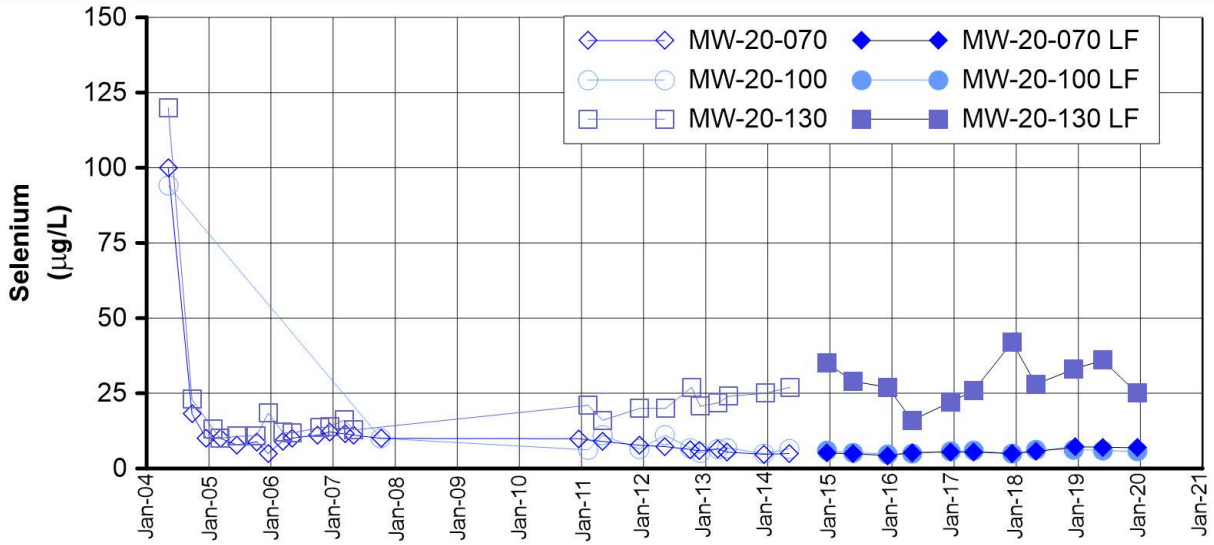


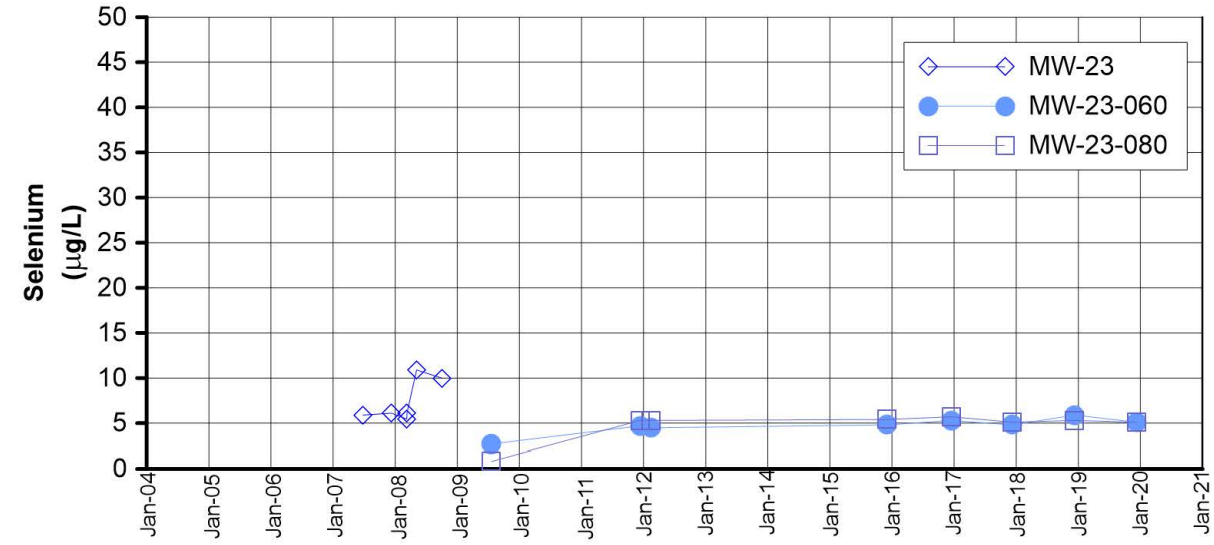
Notes:

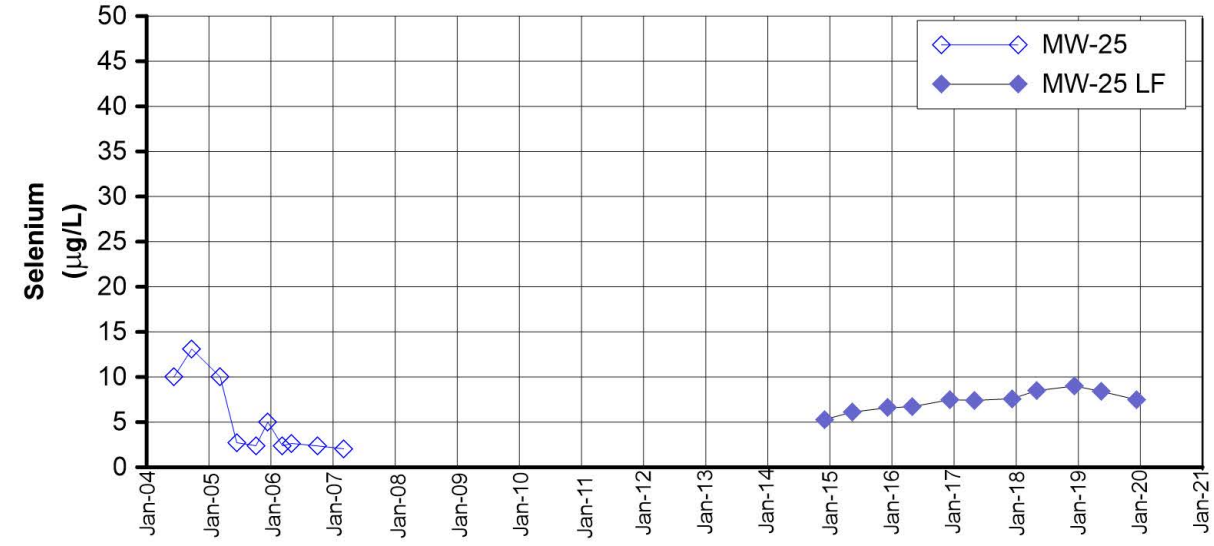
1. LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

FIGURE F-59
SELENIUM
IN MW-14, MW-16, MW-17, MW-18, AND MW-19
FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS





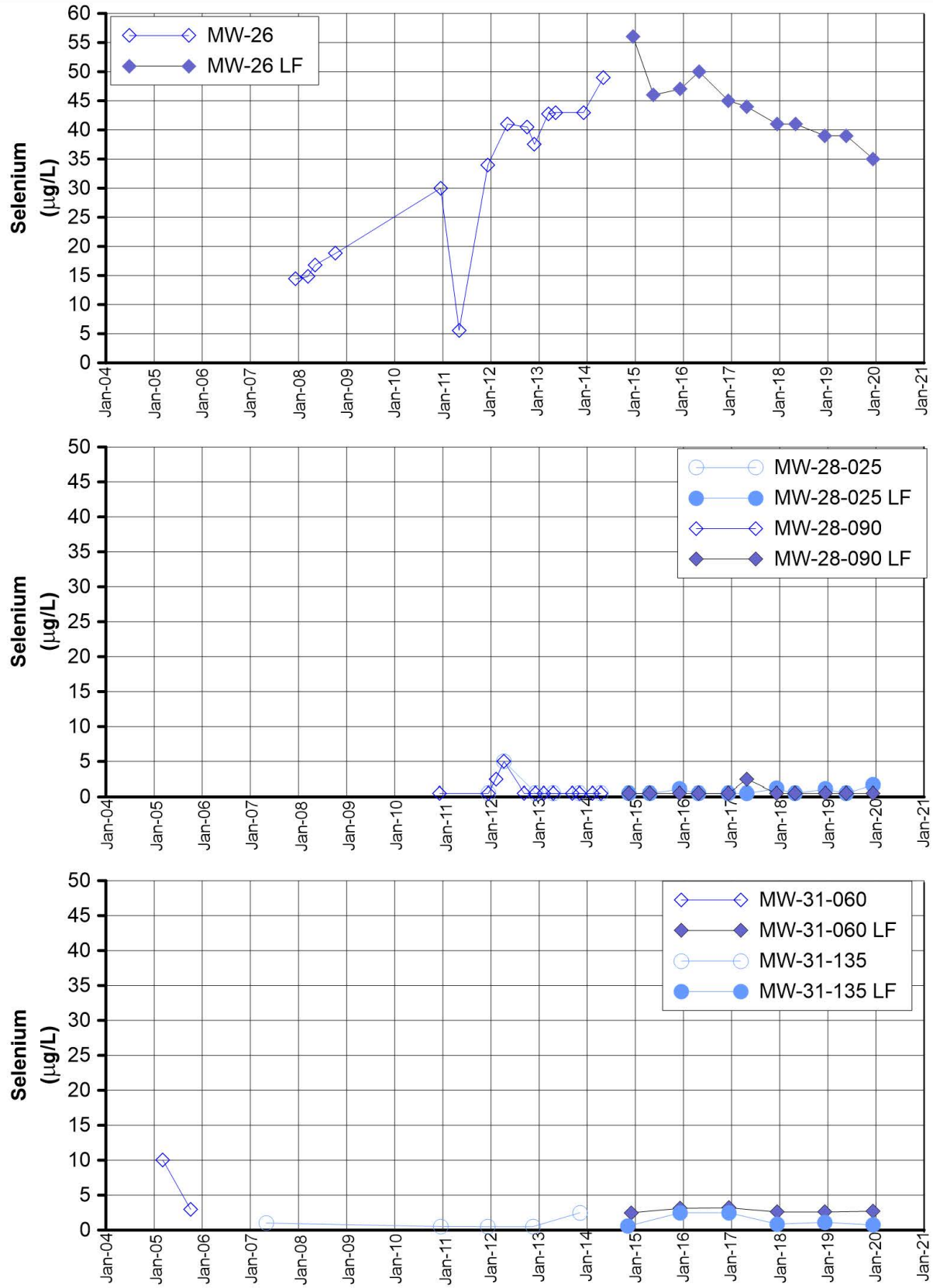


Notes:

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 F-60
SELENIUM
IN MW-20 AND MW-23 CLUSTERS AND MW-25
FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS

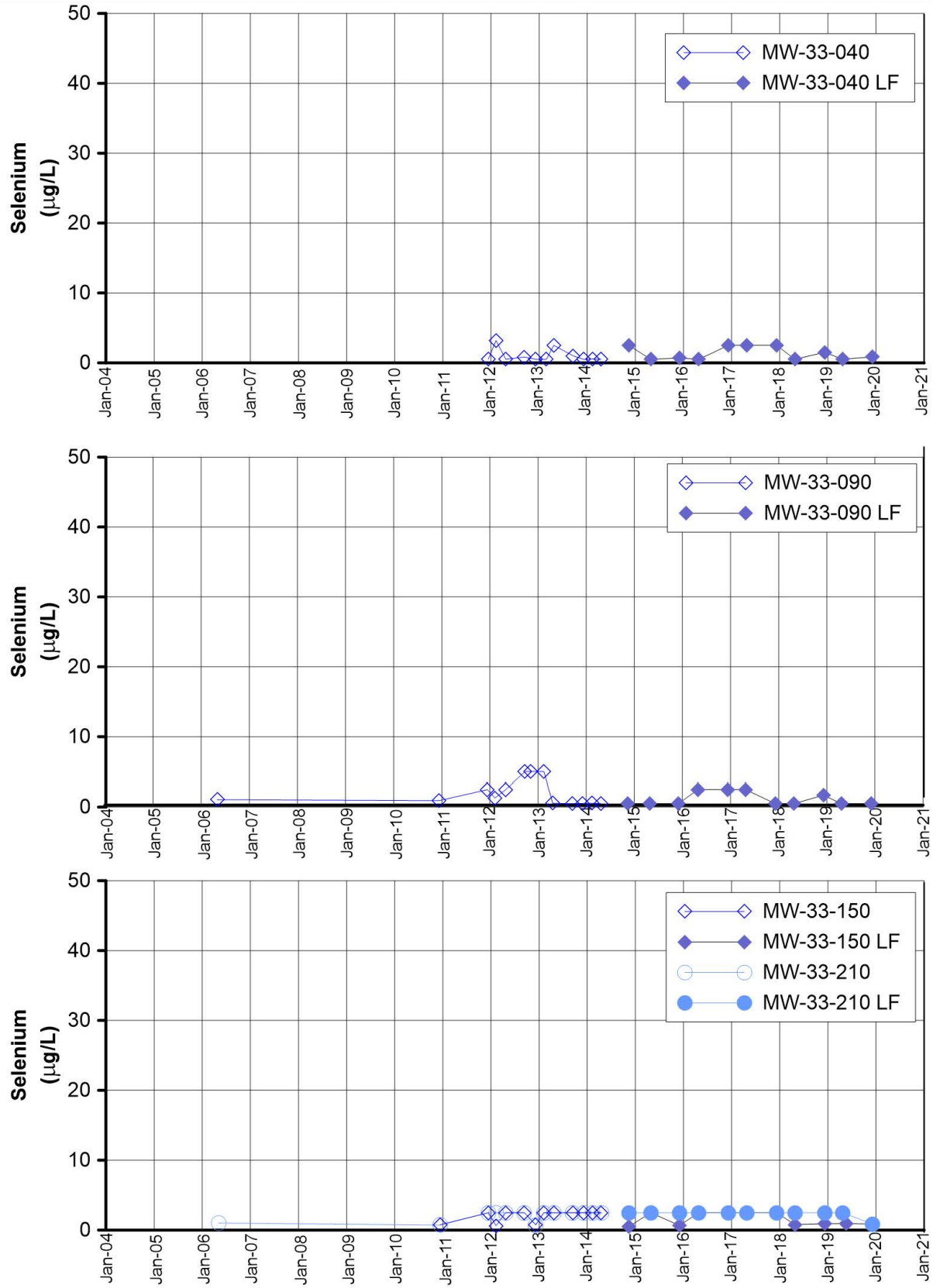


Notes:

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 F-61
SELENIUM
IN MW-26, MW-28, AND MW-31 CLUSTERS
FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS



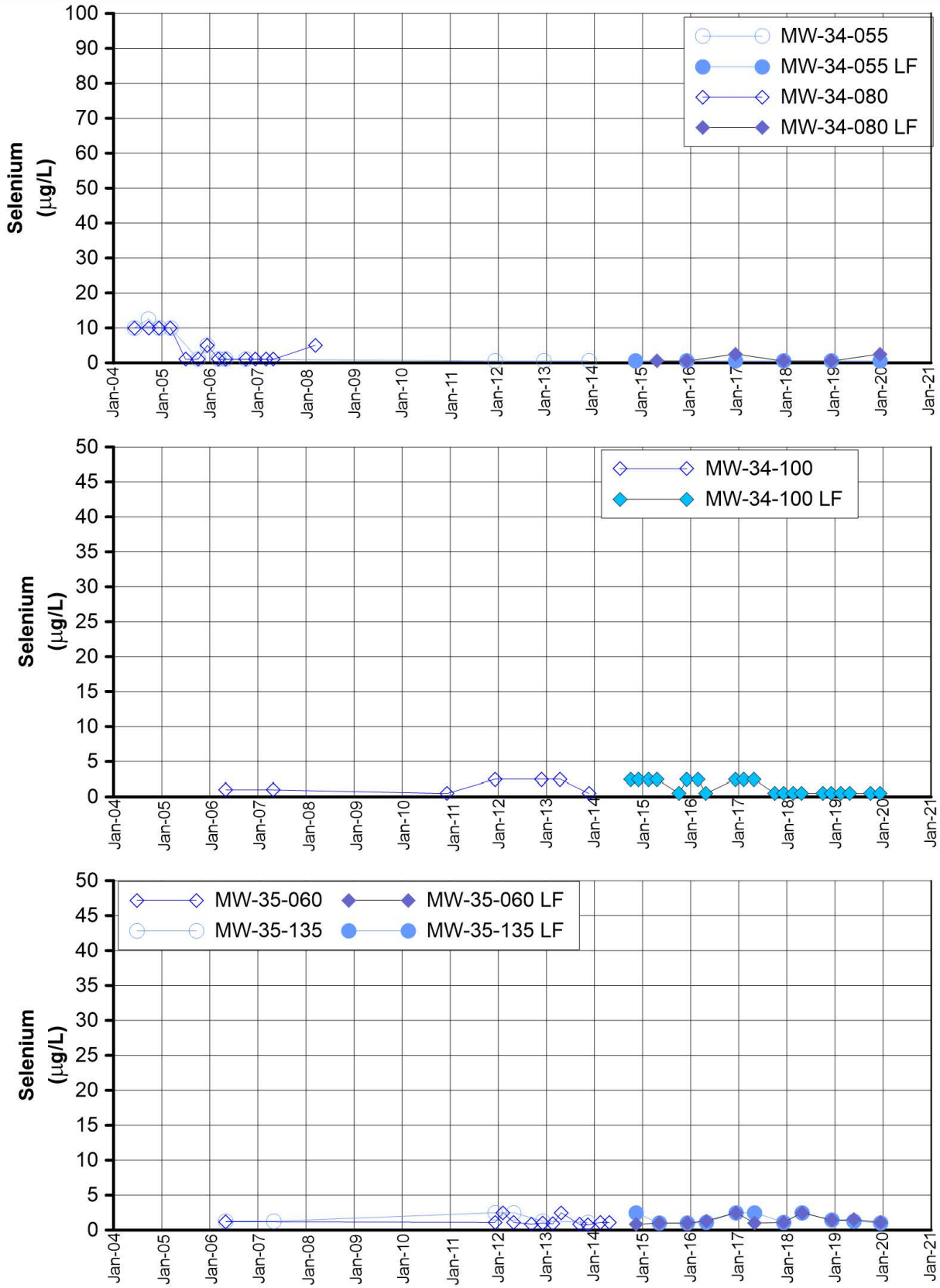
Notes:

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 F-62
SELENIUM
IN MW-33 CLUSTER

FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS

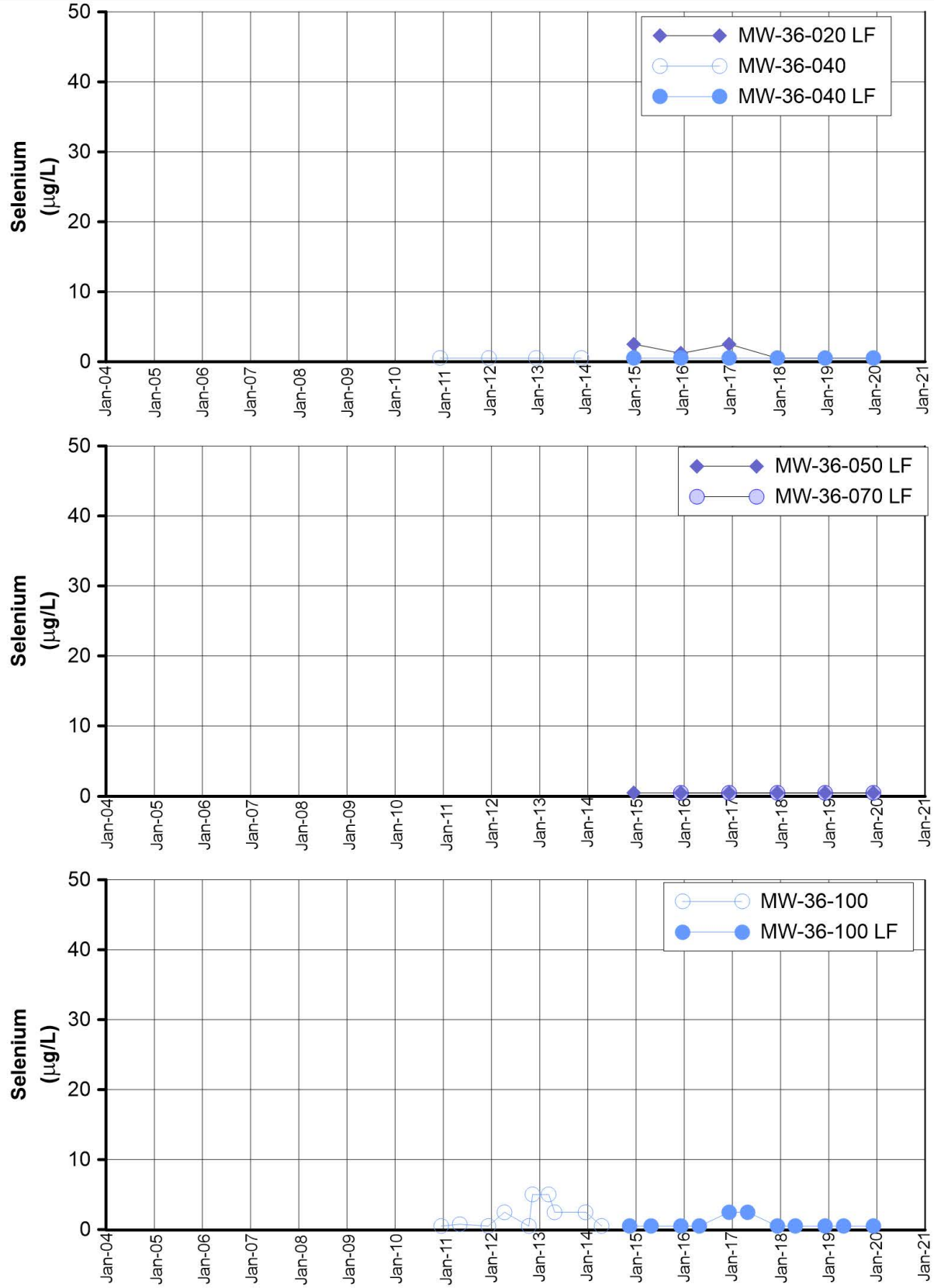


Notes:

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 F-63
SELENIUM
IN MW-34 AND MW-35 CLUSTERS
FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS



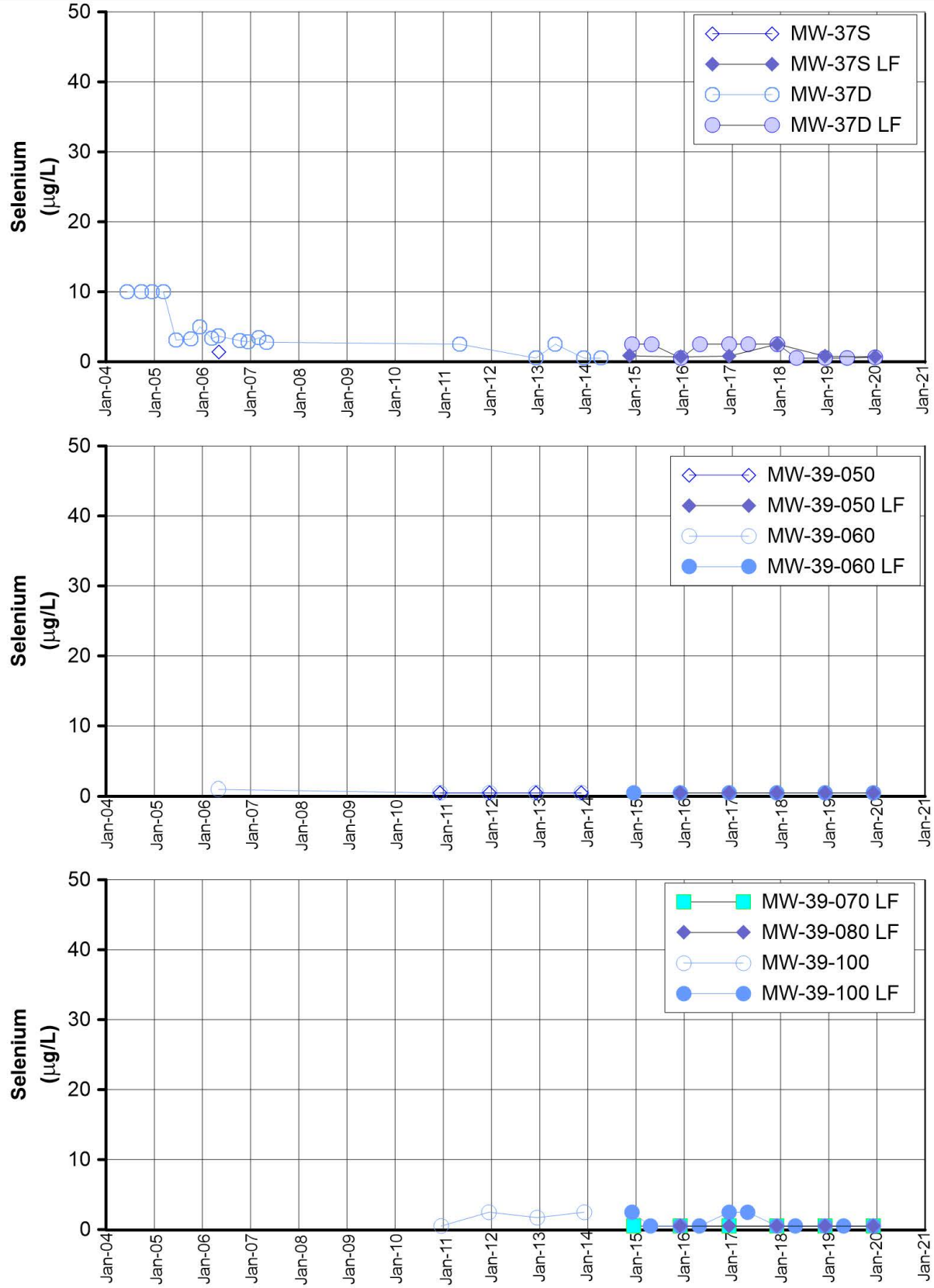
Notes:

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 F-64
SELENIUM
IN MW-36 CLUSTER

FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS



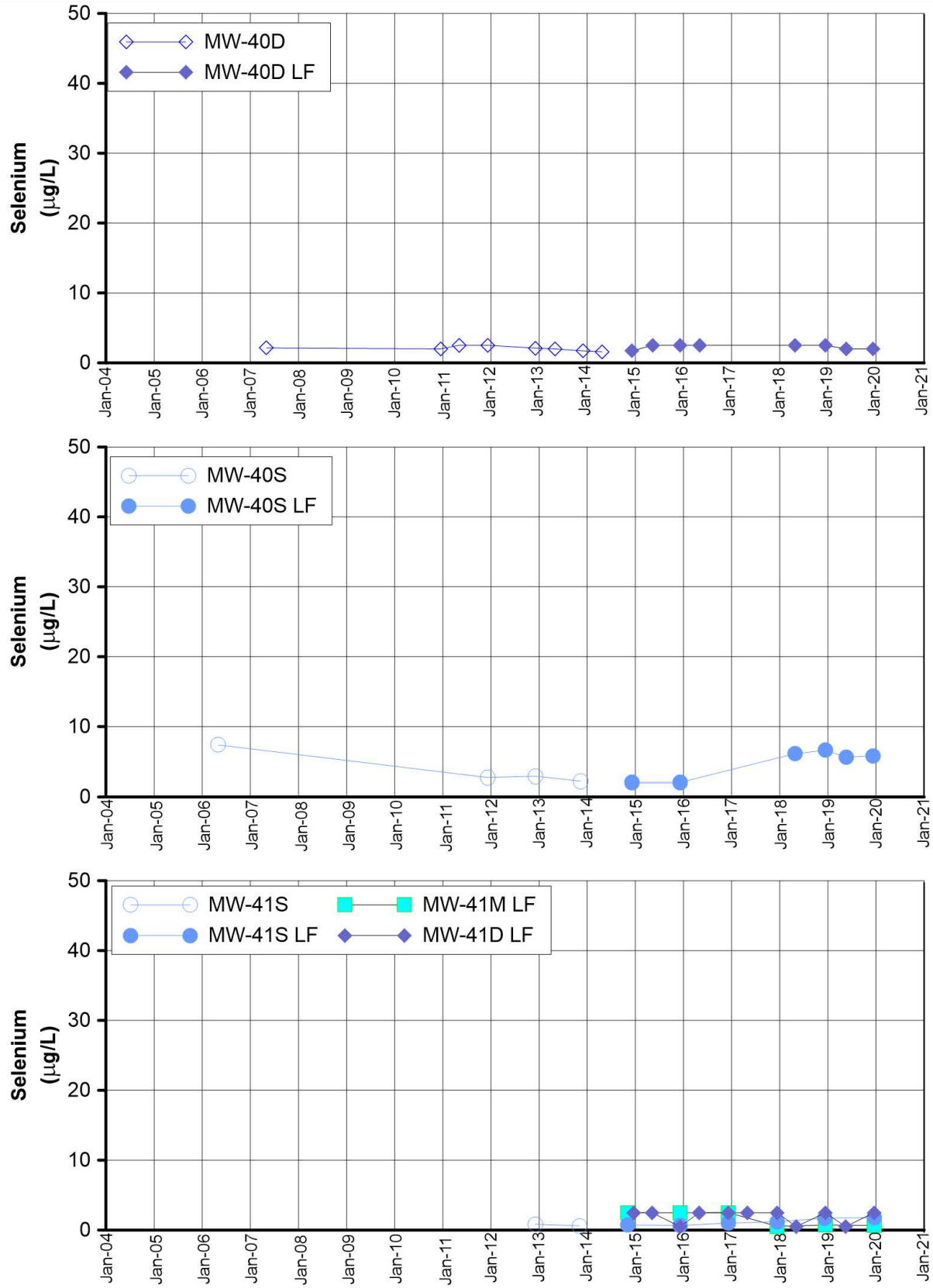
Notes:

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 F-65
SELENIUM
IN MW-37 AND MW-39 CLUSTERS
FOURTH QUARTER 2019 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\17_Q419

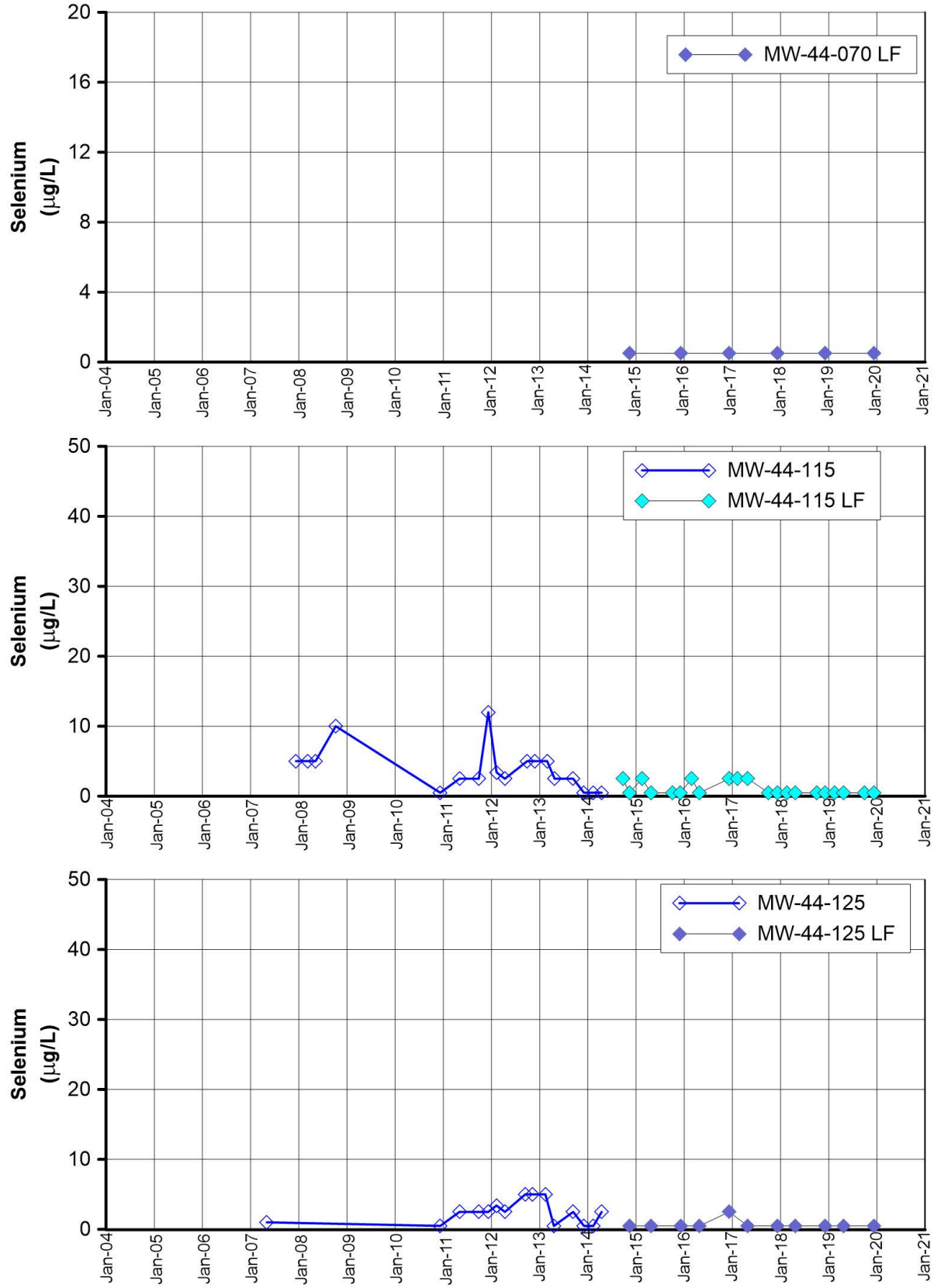


Notes:

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 2017 due to traffic control issues.

FIGURE F-66
SELENIUM
IN MW-40 AND MW-41 CLUSTERS
FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS

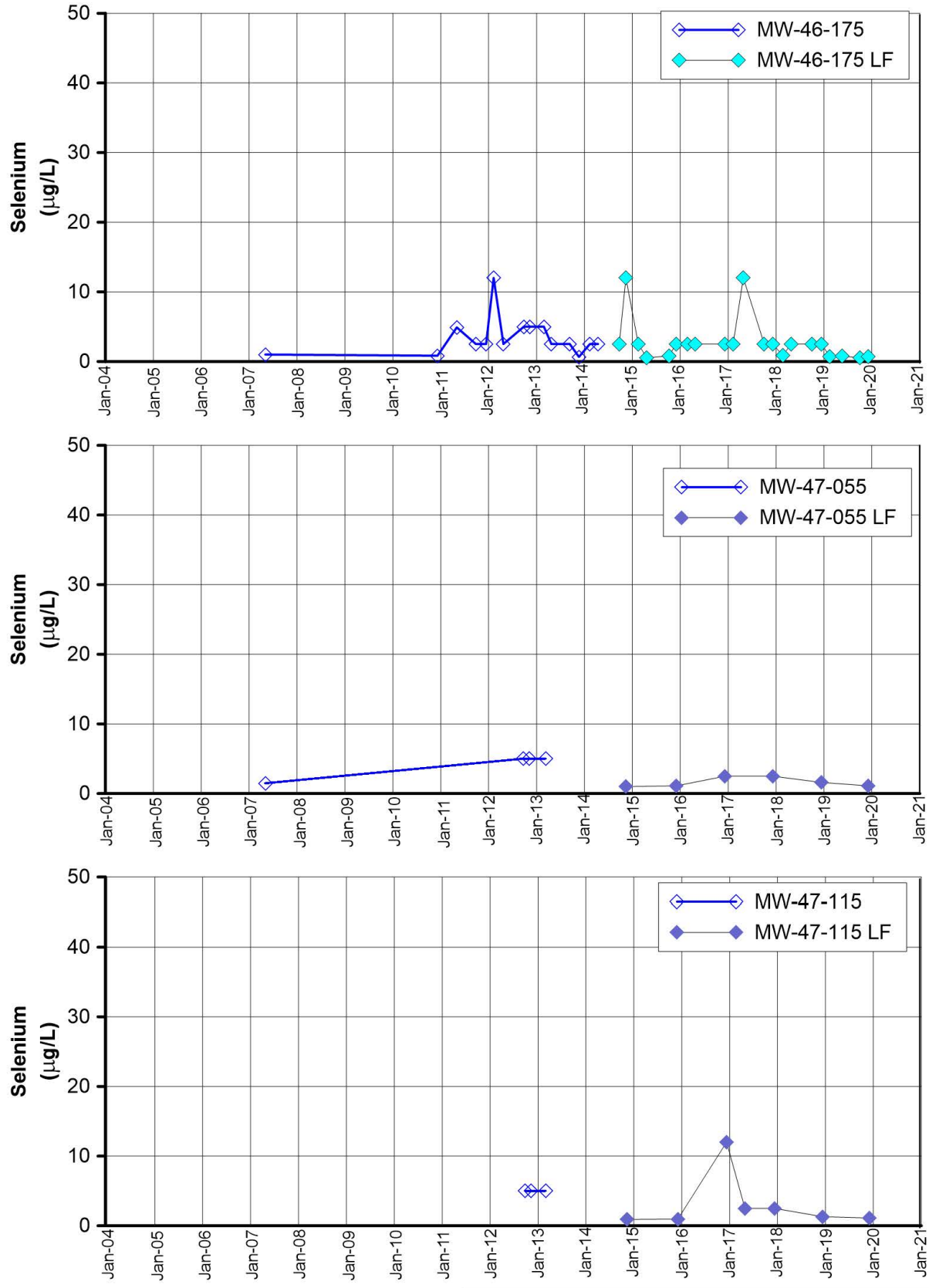


Notes:

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 F-67
SELENIUM
IN MW-44 CLUSTER
FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS

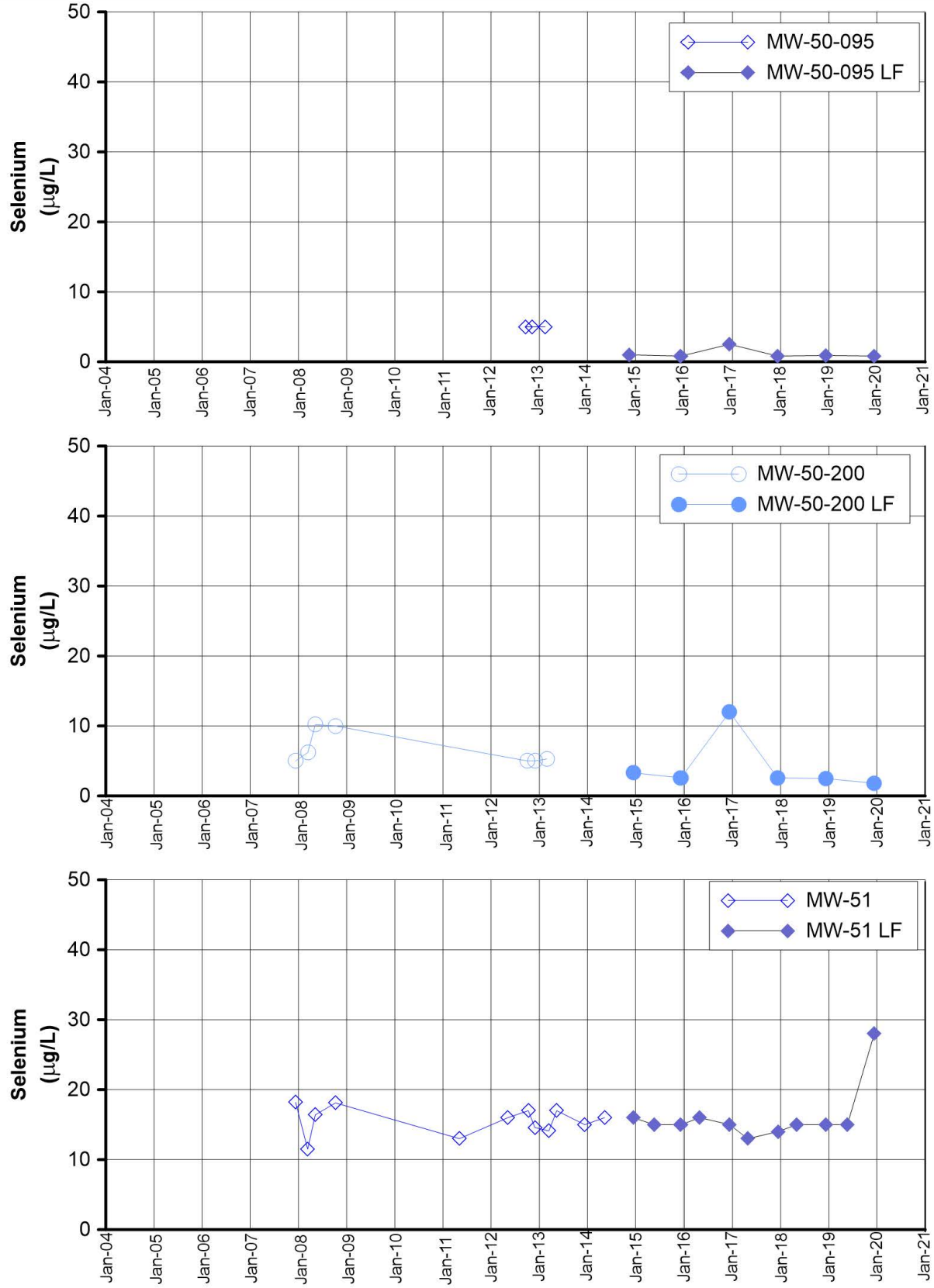


Notes:

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 F-68
SELENIUM
IN MW-46 AND MW-47 CLUSTERS
FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS

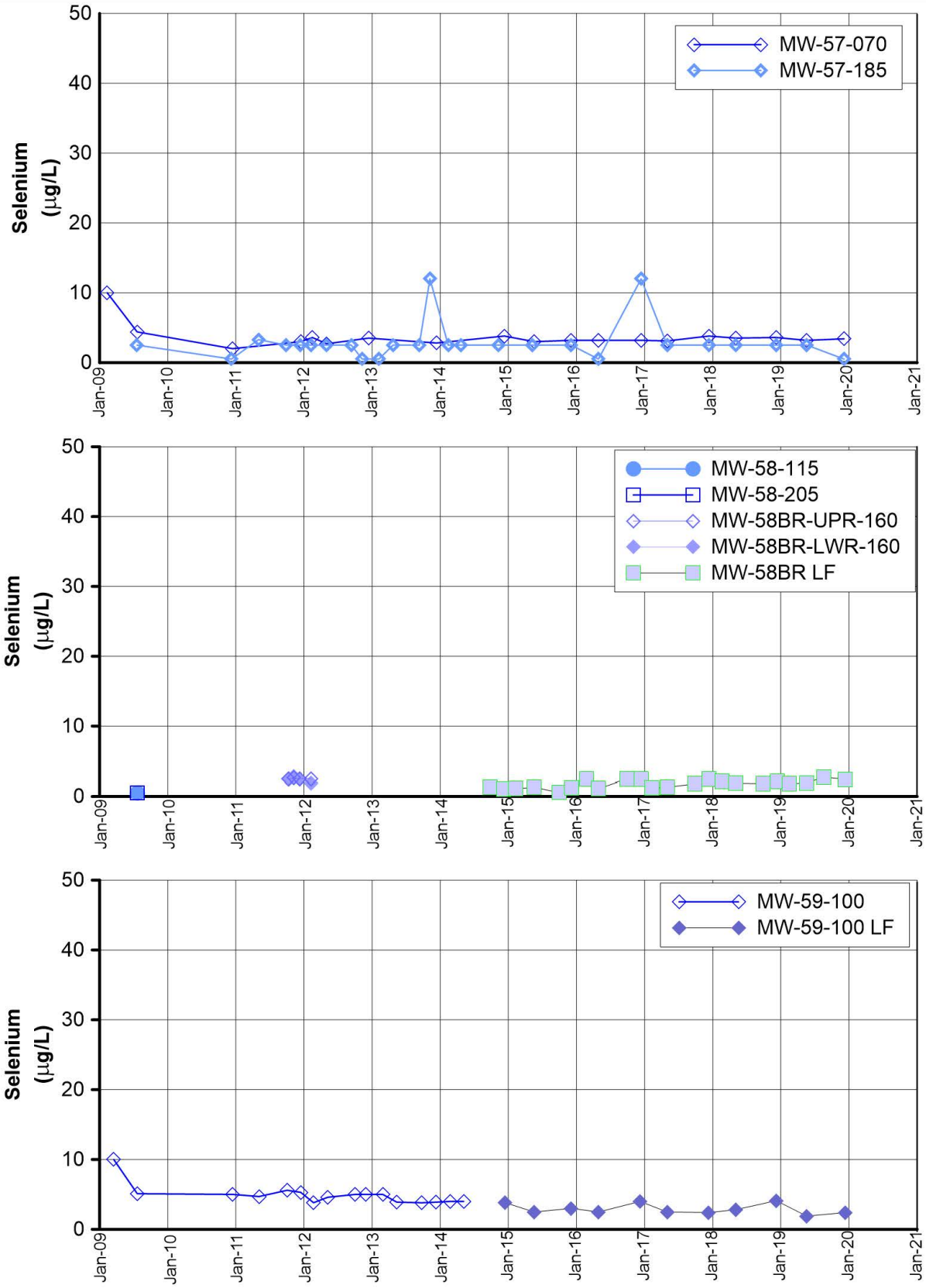


Notes:

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 F-69
SELENIUM
IN MW-50 AND MW-51 CLUSTERS
FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS

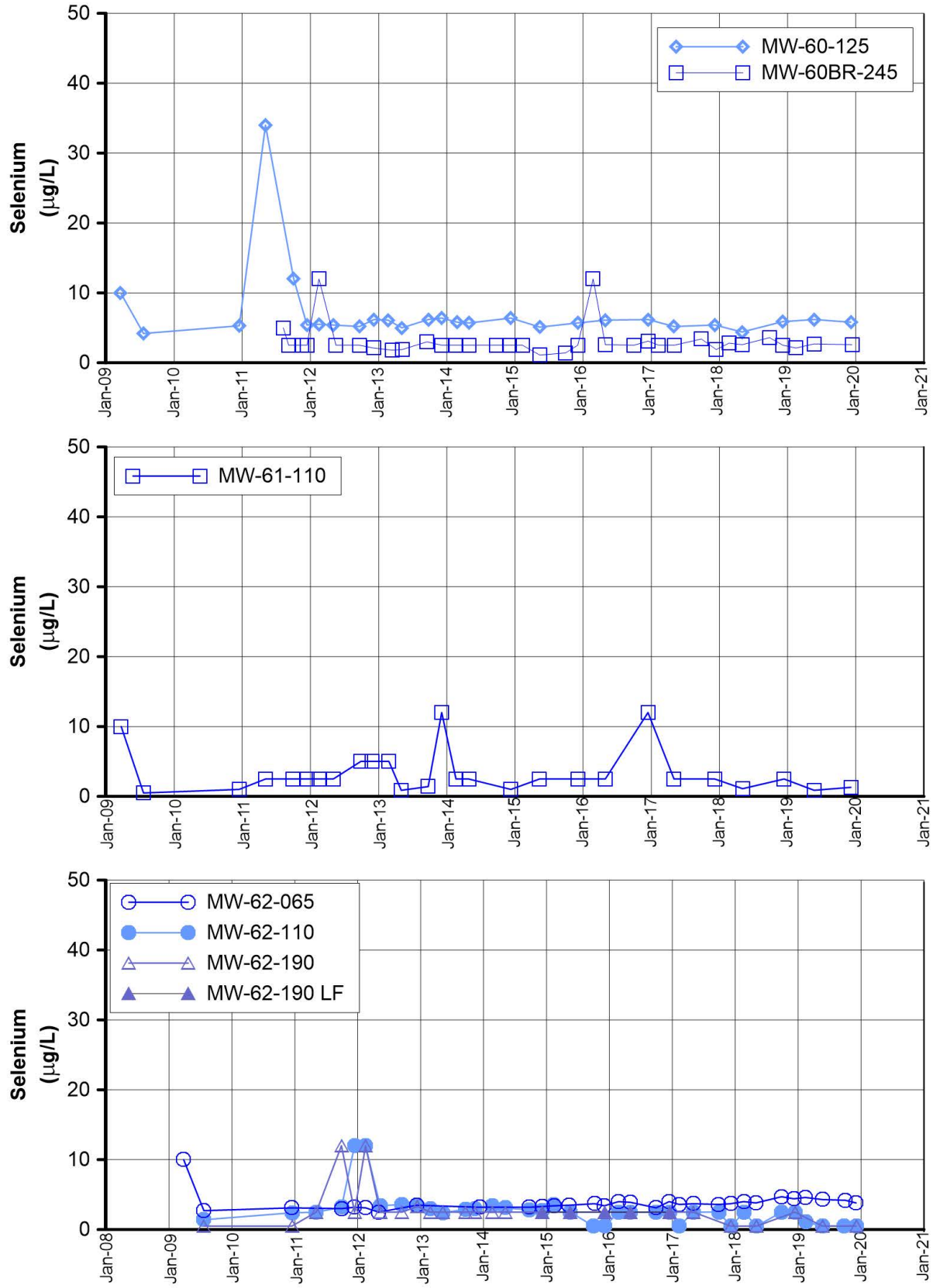


Note:

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 F-70
SELENIUM
IN MW-57 CLUSTER, MW-58 CLUSTER AND MW-59-100
FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS



Notes:

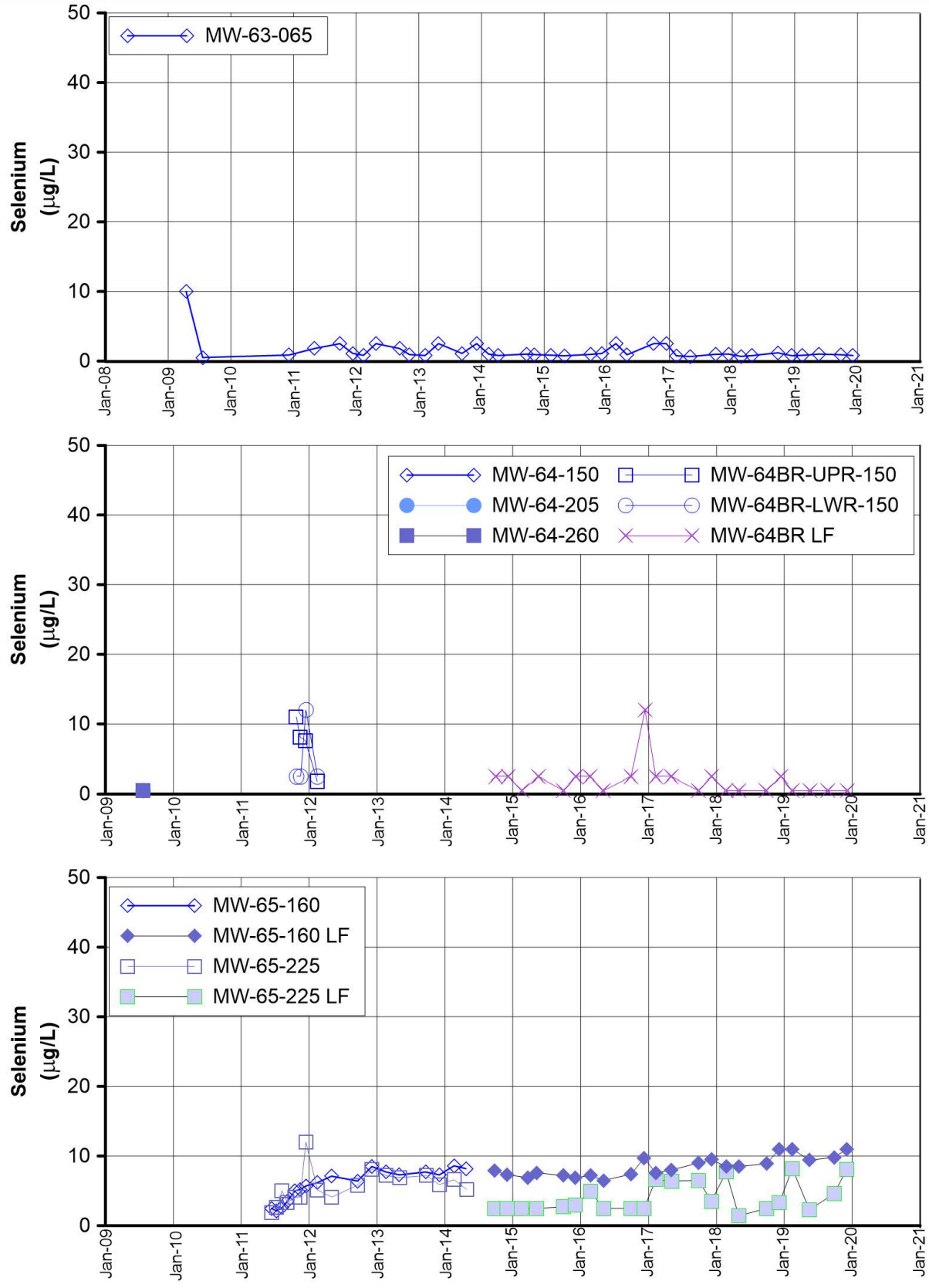
LF = low flow, hexavalent chromium sample collected using low flow sampling method. Data not indicated with (LF) was collected using the three-volume purge sampling method.

1. MW-60-125 sampled using LF method on 5/02/2017 & 12/06/2017.
2. MW-62-065 sampled using LF method on 5/02/2017, 9/25/2017, & 12/06/2017.

FIGURE F-71
SELENIUM
IN MW-60 CLUSTER, MW-61-110, AND MW-62 CLUSTER
FOURTH QUARTER 2019 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\17_Q419



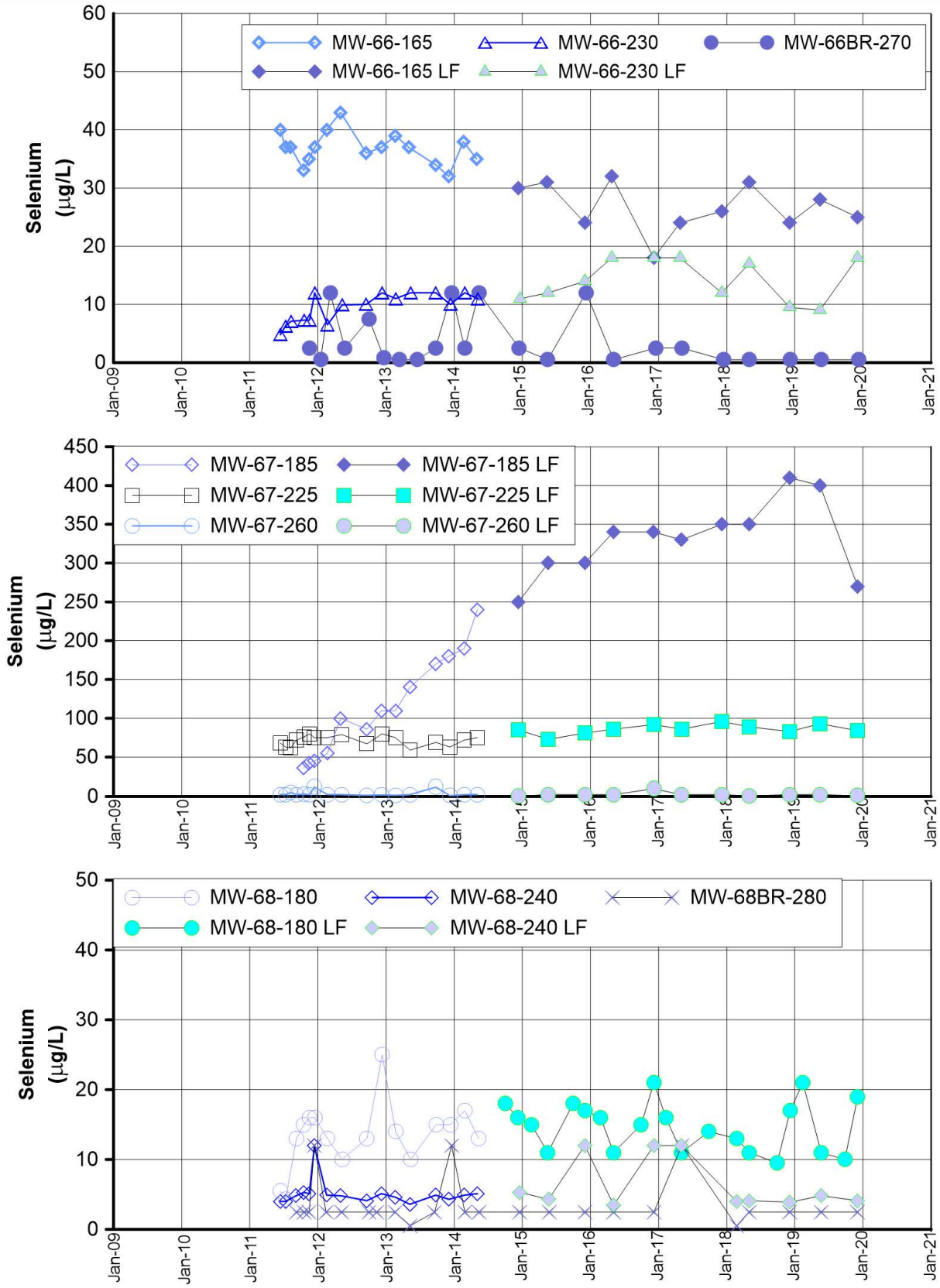
Notes:

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 5/02/2017, 9/28/2017, & 12/12/2017.

FIGURE F-72
SELENIUM
IN MW-63-065, MW-64 CLUSTER AND MW-65 CLUSTER
FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS

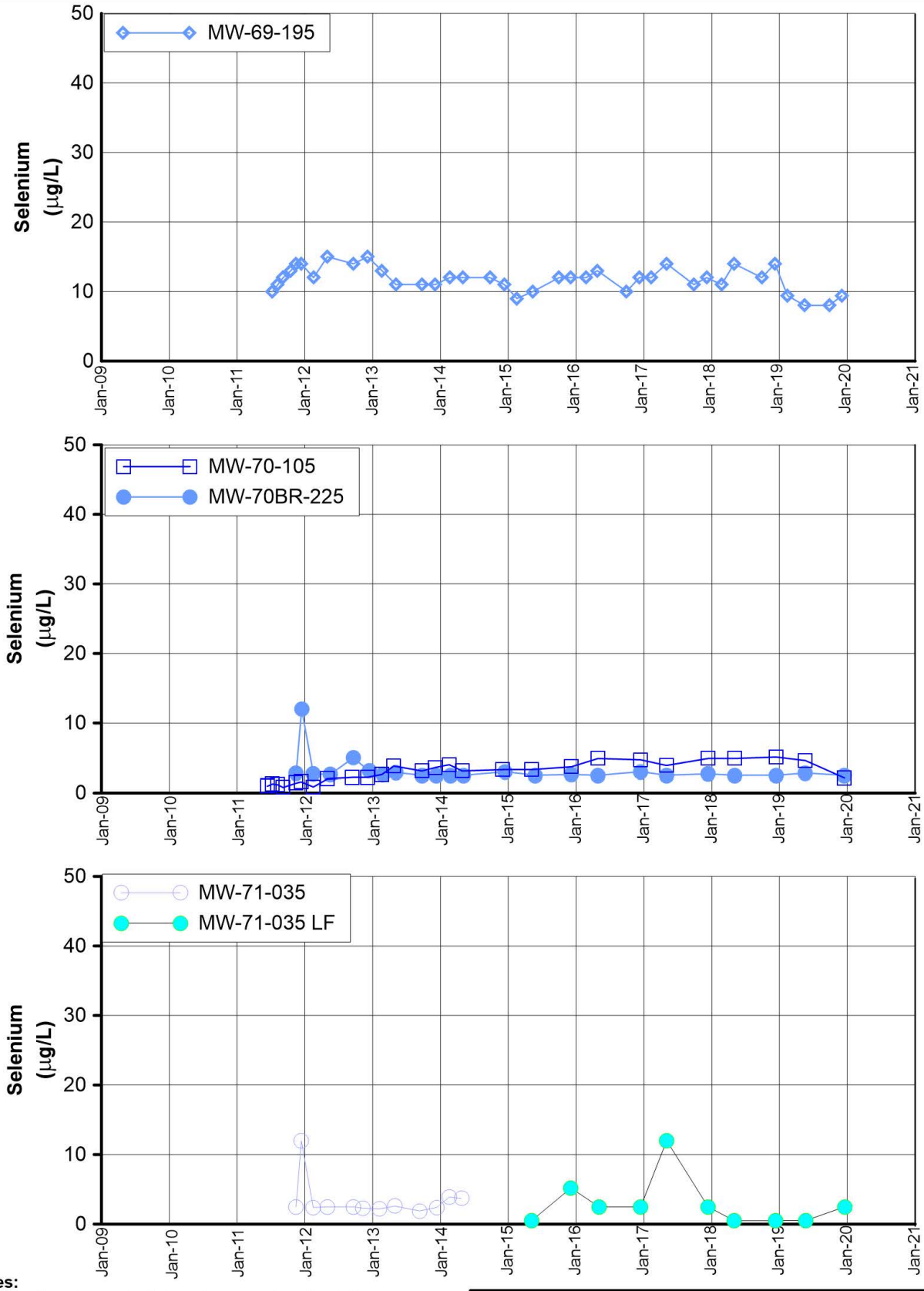


Notes:

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 F-73
SELENIUM
IN MW-66, MW-67, AND MW-68 CLUSTERS
FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS



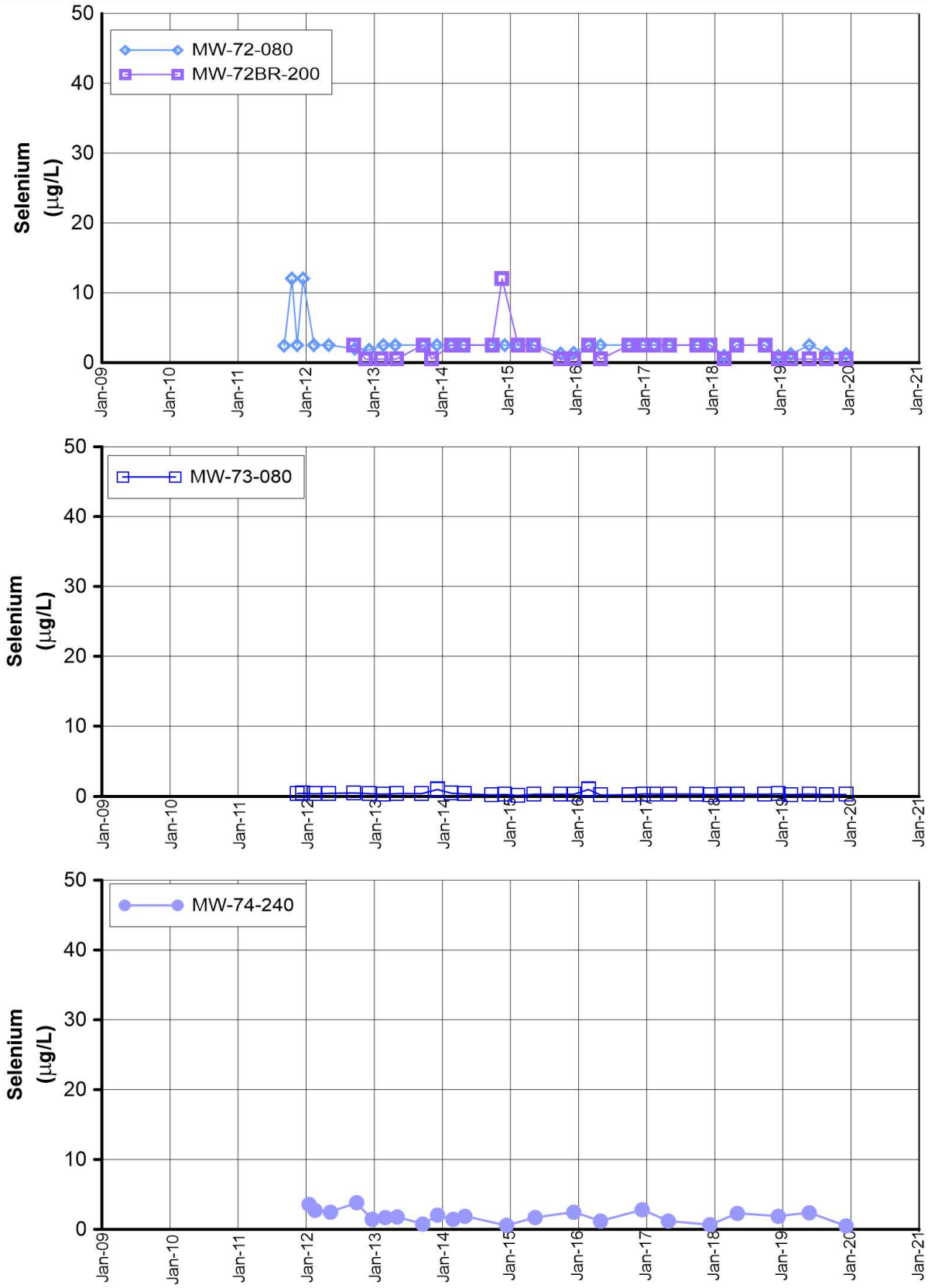
Notes:

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 2/09/2017, 5/03/2017, 9/26/2017, & 12/04/2017.
2. MW-70-105 sampled using LF method on 5/02/2017 & 12/11/2017.

FIGURE F-74
SELENIUM
IN MW-69-195, THE MW-70 CLUSTER, AND MW-71-035
FOURTH QUARTER 2019 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 5/02/2017 & 12/07/2017.
2. MW-73-080 sampled using low flow sampling method on 5/02/2017, 9/27/2017, & 12/06/2017
3. MW-74-240 sampled using low flow sampling method on 4/27/2017 & 12/06/2017.

FIGURE F-75
SELENIUM
IN MW-72 CLUSTER, MW-73-080, AND MW-74-240
FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS

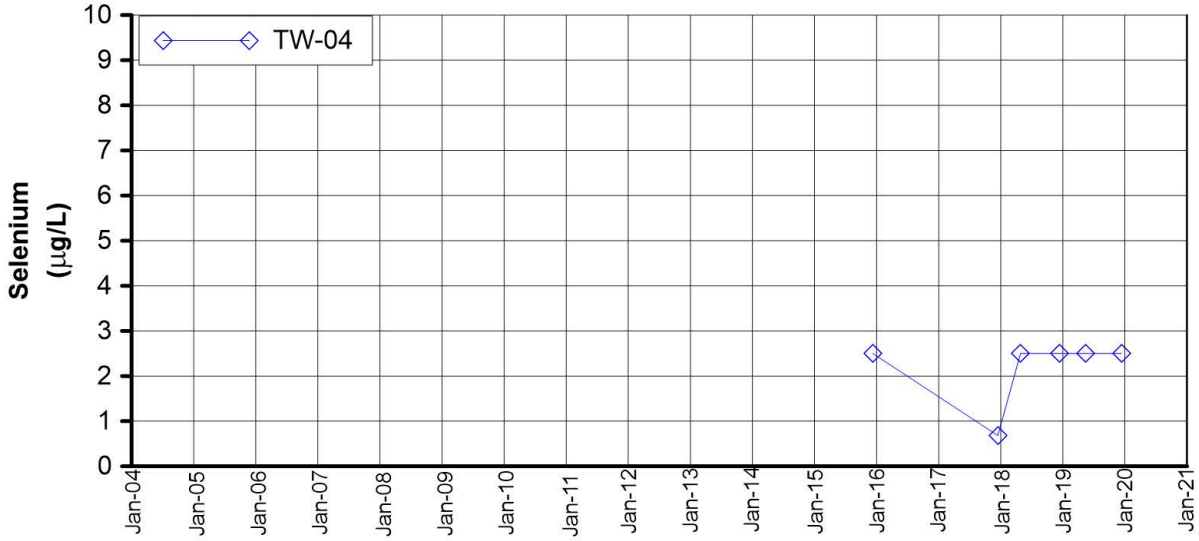


FIGURE F-76
SELENIUM
IN TW-04
FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

ARCADIS

APPENDIX G

Interim Measures Extraction System Operations Log, Fourth Quarter 2019

APPENDIX G

Interim Measures Extraction System Operations Log, Fourth Quarter 2019, PG&E Topock Performance Monitoring Program

During Fourth Quarter 2019 (November and December), extraction well TW-3D operated at a target pump rate of at 135 gallons per minute, excluding periods of planned and unplanned downtime. Extraction well PE-01 was only operated for a brief time on November 7, 2019 and December 4, 2019 to collect monthly samples. Extraction wells TW-2D and TW-2S were not operated during fourth quarter 2019. The operational run time for the Interim Measure groundwater extraction system (combined or individual pumping) was approximately 96.1 percent during Fourth Quarter 2019. The operational run time for the Interim Measure groundwater extraction system (combined or individual pumping) was approximately 94.1 percent during the 2019 annual reporting period.

The Interim Measure Number 3 (IM-3) facility treated approximately 11,271,753 gallons of extracted groundwater during Fourth Quarter 2019. The IM-3 facility also treated no gallons of Final Groundwter Remedy waste water, approximately 4,550 gallons of purge water generated from the groundwater monitoring program and no gallons of injection well water from IM-3 well backwashing/re-development from Groundwater Partners. Two 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 3.9 percent of downtime during Fourth Quarter 2019) 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 2019

- **November 4, 2019 (unplanned):** The extraction well system was offline from 8:22 a.m. to 9:12 a.m. due to the City of Needles needing to adjust the incoming power at the electrical transformer (also known as a voltage tap adjustment). Extraction system downtime was 50 minutes.
- **November 4, 2019 (unplanned):** The extraction well system was offline from 9:14 a.m. to 9:20 a.m. due to a programmable logic controller (PLC) and human machine interface (HMI) connectivity issue. Extraction system downtime was 6 minutes.
- **November 5, 2019 (unplanned):** The extraction well system was offline from 10:00 a.m. to 1:32 p.m. due to replacing microfilter modules. Extraction system downtime was 3 hours 32 minutes.
- **November 11-12, 2019 (unplanned):** The extraction well system was offline from 5:12 p.m. on November 11, 2019 to 12:02 a.m. November 12, 2019 due to Microfilter Feed Pump P-501 failing. The pump was replaced, and the extraction system returned to service. Extraction system downtime was 6 hours 50 minutes.
- **November 12, 2019 (unplanned):** The extraction well system was offline from 10:32 a.m. to 11:50 a.m. due to replacing microfilter modules and repairing a flow meter on the microfilter that was giving inaccurate flow readings. Extraction system downtime was 1 hour 18 minutes.
- **November 15-17, 2019 (unplanned):** The extraction well system was offline from 9:22 a.m. to 10:08 a.m. on November 15, 2019; from 4:50 a.m. to 5:30 a.m. November 16, 2019; and from 10:24 a.m. to 10:46 a.m. November 17, 2019 due to a high water level in Raw Water Storage Tank (T-100). The plant was shut down so the tank could drain below the high-level alarm setpoint. Extraction system downtime was 1 hour 48 minutes.

- **November 18, 2019 (unplanned):** The extraction well system was offline from 11:10 a.m. to 12:14 p.m. due to replacing microfilter modules. Extraction system downtime was 1 hour 4 minutes.
- **November 18-21, 2019 (unplanned):** The extraction well system was offline from 11:18 p.m. on November 18, 2019 to 12:02 a.m. November 19, 2019; from 1:34 a.m. to 2:30 a.m. November 20, 2019; and from 2:36 a.m. to 3:26 a.m. November 21, 2019 due to a high water level in T-100. The plant was shut down so the tank could drain below the high-level alarm setpoint. Extraction system downtime was 2 hours 30 minutes.
- **November 21, 2019 (unplanned):** The extraction well system was offline from 11:50 a.m. to 12:14 p.m. due to replacing plugged prefilters in the reverse osmosis system. Extraction system downtime was 24 minutes.
- **November 22, 2019 (unplanned):** The extraction well system was offline from 7:04 p.m. to 8:18 p.m. due to a high water level in T-100. The plant was shut down so the tank could drain below the high-level alarm setpoint. Extraction system downtime was 1 hour 14 minutes.
- **November 23, 2019 (unplanned):** The extraction well system was offline from 8:10 a.m. to 9:12 p.m. due to replacing microfilter modules. Extraction system downtime was 1 hour 2 minutes.
- **November 24-25, 2019 (unplanned):** The extraction well system was offline from 1:02 a.m. to 1:50 a.m., and from 9:16 p.m. to 10:10 p.m. November 24, 2019, and from 6:30 p.m. to 7:20 p.m. November 25, 2019 due to a high water level in T-100. The plant was shut down so the tank could drain below the high-level alarm setpoint. Extraction system downtime was 2 hours 32 minutes.
- **November 26, 2019 (unplanned):** The extraction well system was offline from 7:02 p.m. to 7:46 p.m. due to replacing microfilter modules. Extraction system downtime was 44 minutes.
- **November 27, 2019 (planned):** The extraction well system was offline from 11:06 a.m. to 12:48 p.m. due testing of the pipeline critical alarms and leak detection system. Extraction system downtime was 1 hour 42 minutes.
- **November 30, 2019 (unplanned):** The extraction well system was offline from 9:54 p.m. to 10:40 p.m. due to a high water level in T-100. The plant was shut down so the tank could drain below the high-level alarm setpoint. Extraction system downtime was 46 minutes.

G.2 December 2019

- **December 2-4, 2019 (unplanned):** The extraction well system was offline from 2:44 p.m. to 4:34 p.m. on December 2, 2019; and from 12:06 a.m. to 1:18 a.m. December 4, 2019 due to a high water level in Raw Water Storage Tank (T-100). The plant was shut down so the tank could drain below the high-level alarm setpoint. Extraction system downtime was 3 hours 2 minutes.
- **December 4, 2019 (unplanned):** The extraction well system was offline from 8:04 a.m. to 1:00 p.m. due to replacing microfilter modules. The Pretreated Water Transfer Pump (P-500) failed to start back up and was replaced. Extraction system downtime was 4 hours 56 minutes.
- **December 4, 2019 (unplanned):** The extraction well system was offline from 2:50 p.m. to 3:02 p.m. due to a programmable logic controller (PLC) and human machine interface (HMI) connectivity issue. Extraction system downtime was 12 minutes.
- **December 5, 2019 (unplanned):** The extraction well system was offline from 2:16 p.m. to 2:26 p.m. because operators tried to disconnect the PE-1 signal wire for remedy construction to be able to do work on the MW-20 bench. The signal wire was tied to the PermAlert system (leak detection on the

extraction pipeline) and gave a false alarm when disconnected. When the PermAlert system alarms it automatically shuts down the extraction system. Extraction system downtime was 10 minutes.

- **December 6-8, 2019 (unplanned):** The extraction well system was offline from 9:00 p.m. to 10:06 p.m. on December 6, 2019; and from 1:14 p.m. to 2:26 p.m. December 8, 2019 due to a high water level in T-100. The plant was shut down so the tank could drain below the high-level alarm setpoint. Extraction system downtime was 2 hours 18 minutes.

- **December 9, 2019 (unplanned):** The extraction well system was offline from 8:12 a.m. to 12:42 p.m. to replace Clarifier Feed Pump (P-400), which had been having difficulty keeping up with the flow. Also, removed sludge from Iron Oxidation Reactor 3 (T-301C). Extraction system downtime was 4 hours 30 minutes.

- **December 10, 2019 (unplanned):** The extraction well system was offline from 9:04 a.m. to 12:16 p.m. due to a failed level sensor, high pressure, and overflowed tank. The microfilter strainer received a high pressure alert and shut down the microfilter, which also shut down P-500. With P-500 off, the Pre-treated Water Tank (T-500) overflowed to the plant drains. All plant drains flow to the Process Drain Tank (T-900). T-900 at that time had a bad level sensor and was being operated manually by the operator verifying the level and starting or stopping the pump. With P-900 being off and having a failed level sensor, the operator did not know until he went to manually check the level (approximately every 2-2.5 hrs) that T-900 was overflowing into the T-900 vault. The plant was shut down, water was removed from the T-900 vault, the strainer was cleaned, and the plant was returned to service. Extraction system downtime was 3 hours 12 minutes.

- **December 10, 2019 (unplanned):** The extraction well system was offline from 2:18 p.m. to 4:18 p.m. due to precautionary measures due to abnormal turbidity process control readings at Treated Water Tank (T-700). After the microfilter shutdown earlier in the day, the initial blast of water from the microfilter into the empty Reverse Osmosis Feed Tank (T-600) caused scaled solids to break loose and flow to the Treated Water Storage Tank (T-700). Routine monitoring by the operator showed higher than normal turbidity of 2.72 NTU. Operators emptied T-700 for reprocessing. Extraction was shut down to lower water levels in T-100. Extraction system downtime was 2 hours.

- **December 15, 2019 (unplanned):** The extraction well system was offline from 8:06 a.m. to 10:00 a.m. due to working on the microfilter. A leak was found in one of the module concentrate lines. The extraction system was shut down to fix it and then returned to service. Extraction system downtime was 1 hour 54 minutes.

- **December 17, 2019 (unplanned):** The extraction well system was offline from 10:52 a.m. to 11:14 a.m. due to a plugged microfilter strainer that caused P-500 to shut off. The strainer was cleaned, and extraction was turned back on. Extraction system downtime was 22 minutes.

- **December 17, 2019 (unplanned):** The extraction well system was offline from 1:14 p.m. to 2:20 p.m. to replace the level sense in T-301C. Extraction system downtime was 1 hour 6 minutes.

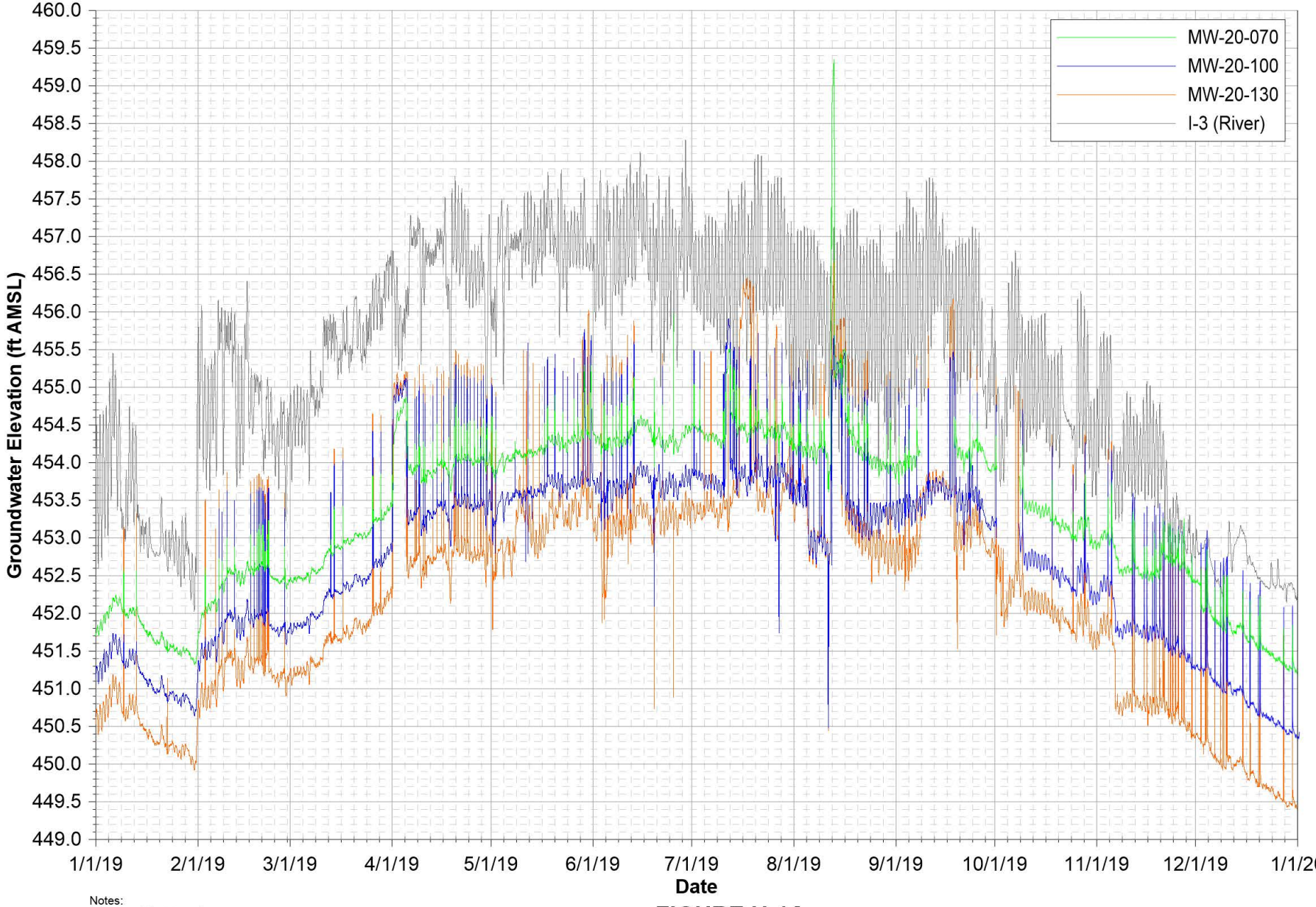
- **December 20, 2019 (unplanned):** The extraction well system was offline from 1:00 a.m. to 1:56 a.m. due to a high-water level in T-100. The plant was shut down so the tank could drain below the high-level alarm setpoint. Extraction system downtime was 56 minutes.

- **December 20, 2019 (unplanned):** The extraction well system was offline from 12:10 p.m. to 3:18 p.m. due to replacing microfilter modules, cleaning the Raw Water Storage Tank (T-100) strainers, and replacing the inline mixer at the discharge of P-400 where polymer is injected. The mixer was removed to inspect for scaling and replaced with a clean one. Extraction system downtime was 3 hours 8 minutes.

- **December 27, 2019 (unplanned):** The extraction well system was offline from 5:16 p.m. to 6:24 p.m. due to a high-water level in T-100. The plant was shut down so the tank could drain below the high-level alarm setpoint. Extraction system downtime was 1 hour 8 minutes.
- **December 30, 2019 (unplanned):** The extraction well system was offline from 9:12 a.m. to 10:50 a.m. due to replacing microfilter modules. Extraction system downtime was 1 hour 38 minutes.

APPENDIX H

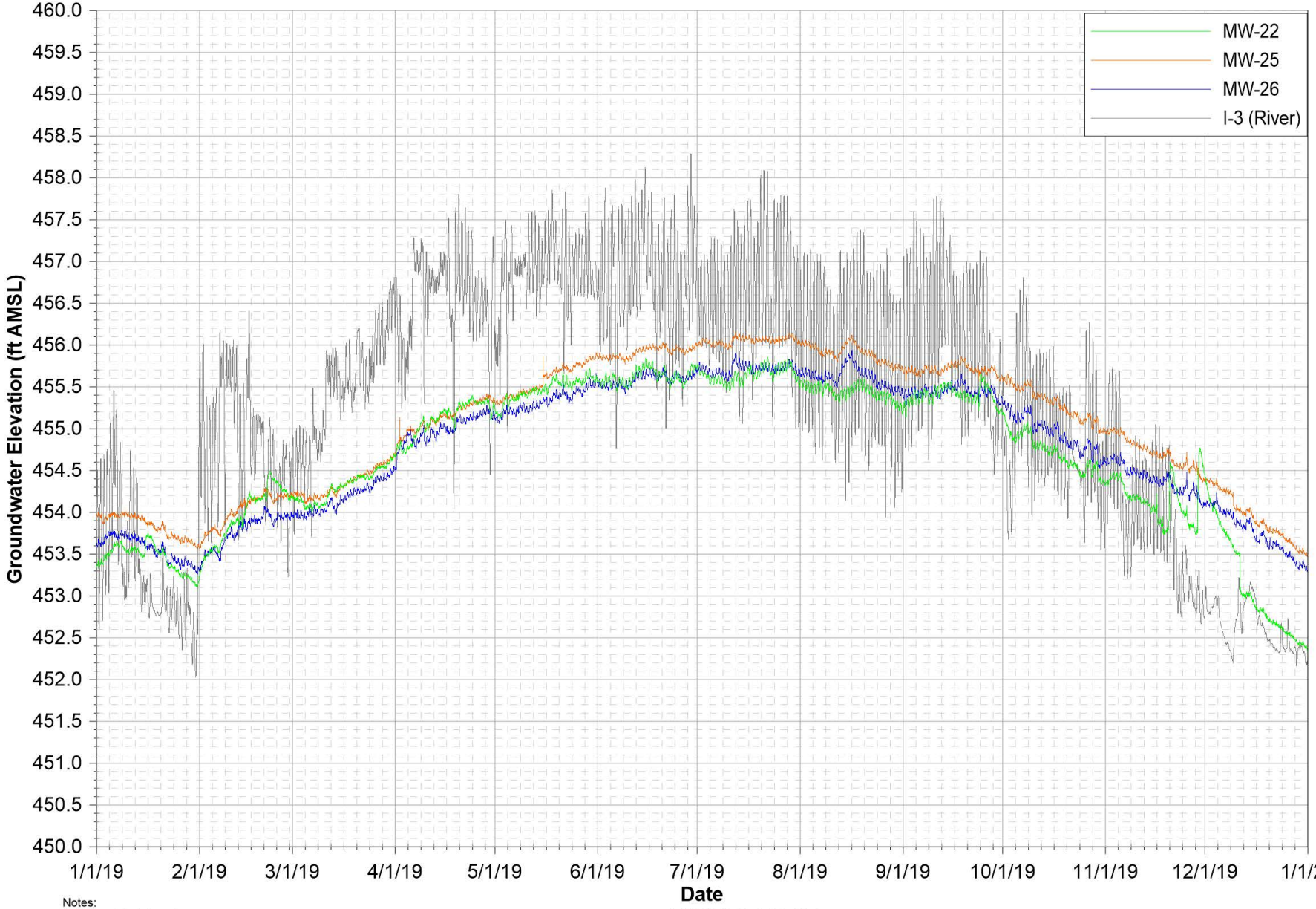
Hydrographs, Fourth Quarter 2019



Notes:
1. Data subject to review.
2. ft AMSL = feet above mean sea level.
3. MW-20-070 data unavailable from September 8, 2019 through September 18, 2019 and from October 1, 2019 through October 8, 2019 due to transducer malfunction.
4. MW-20-100 data unavailable from October 1, 2019 through October 8, 2019 due to transducer malfunction.

FIGURE H-1A
MW-20 CLUSTER HYDROGRAPHS
FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS



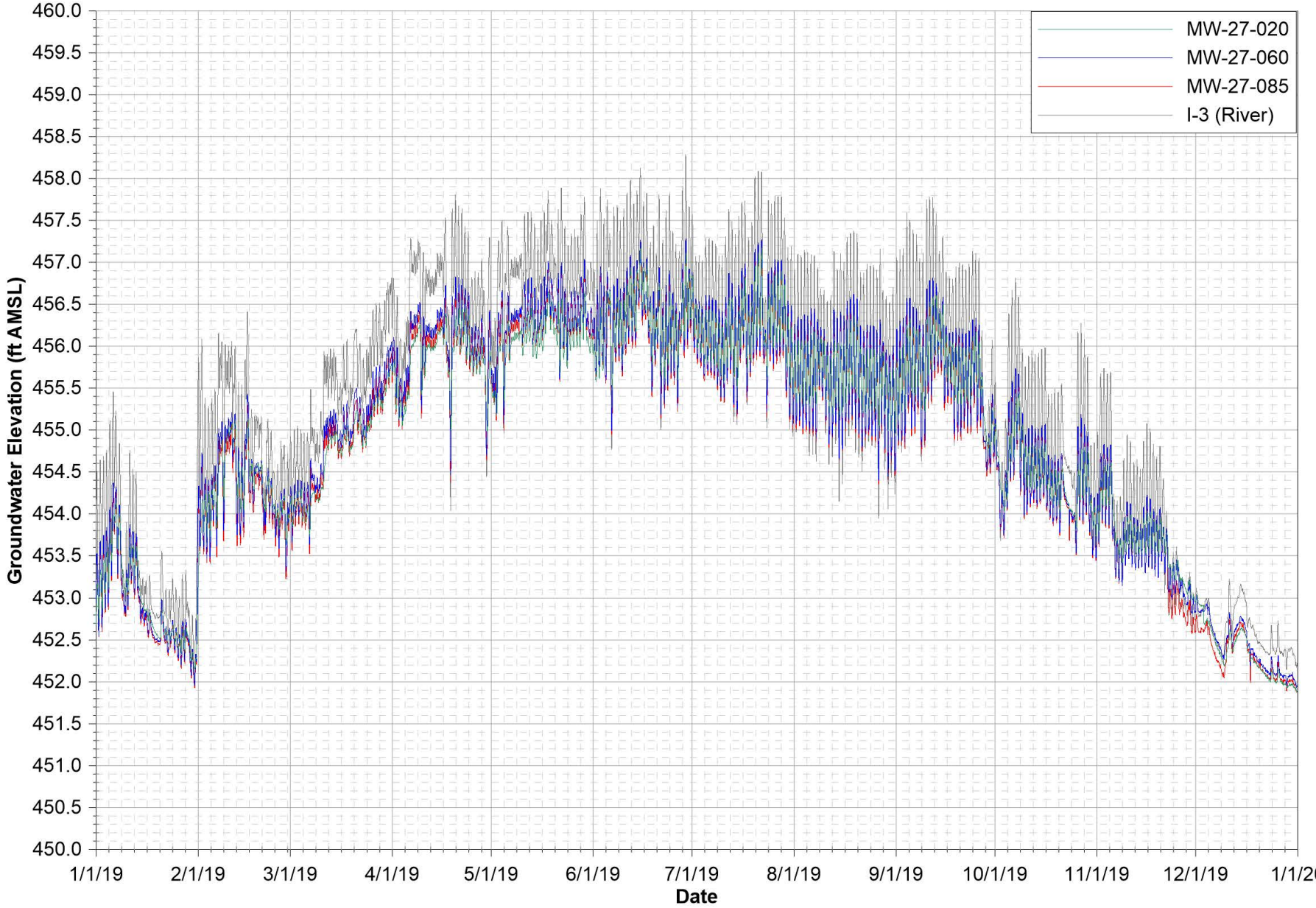
Notes:
1. Data subject to review.
2. ft AMSL = feet above mean sea level.

FIGURE H-1B

MW-22, MW-25, AND MW-26 HYDROGRAPHS

FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS



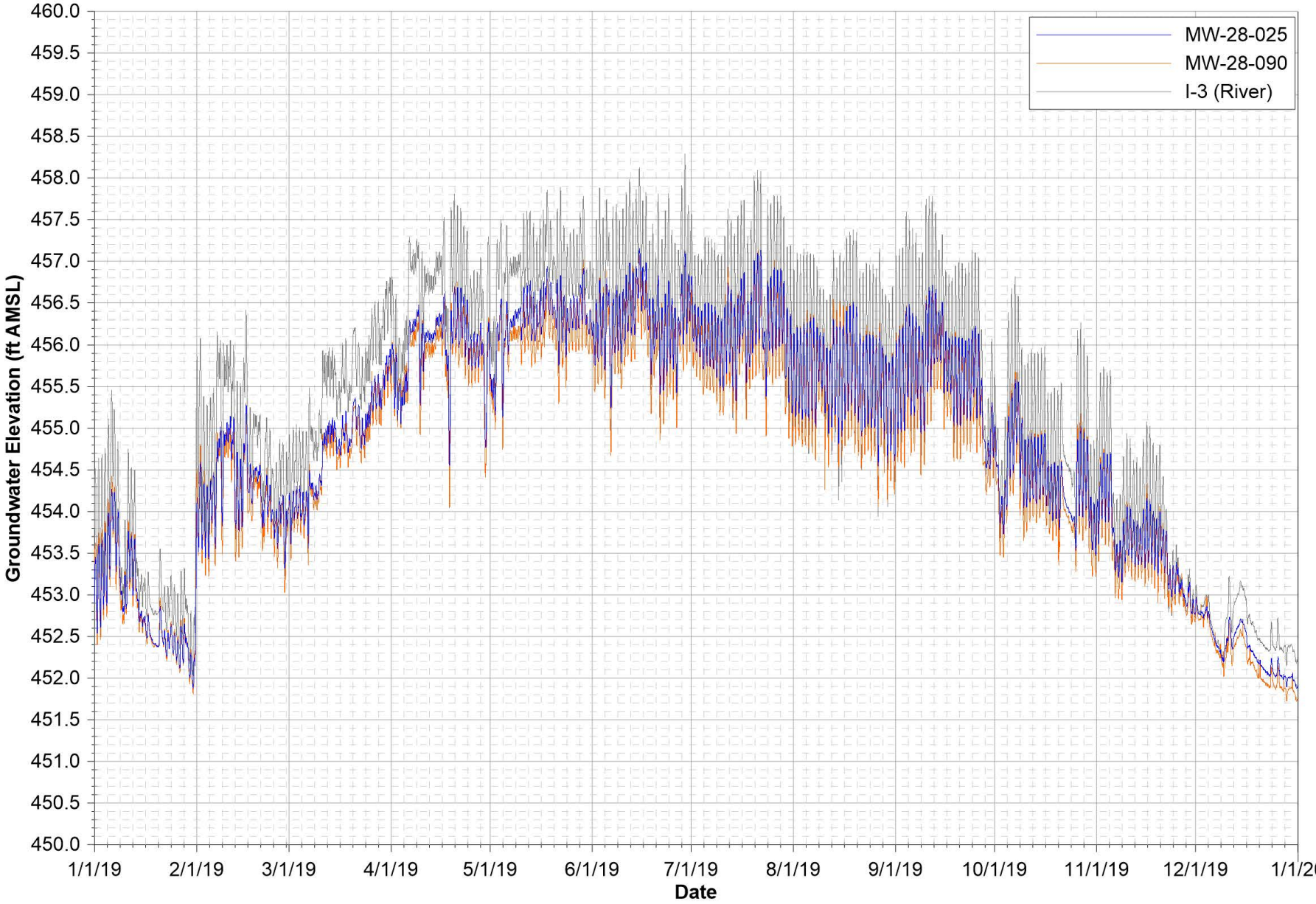
Notes:
1. Data subject to review.
2. ft AMSL = feet above mean sea level

FIGURE H-1C

MW-27 CLUSTER HYDROGRAPHS

FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

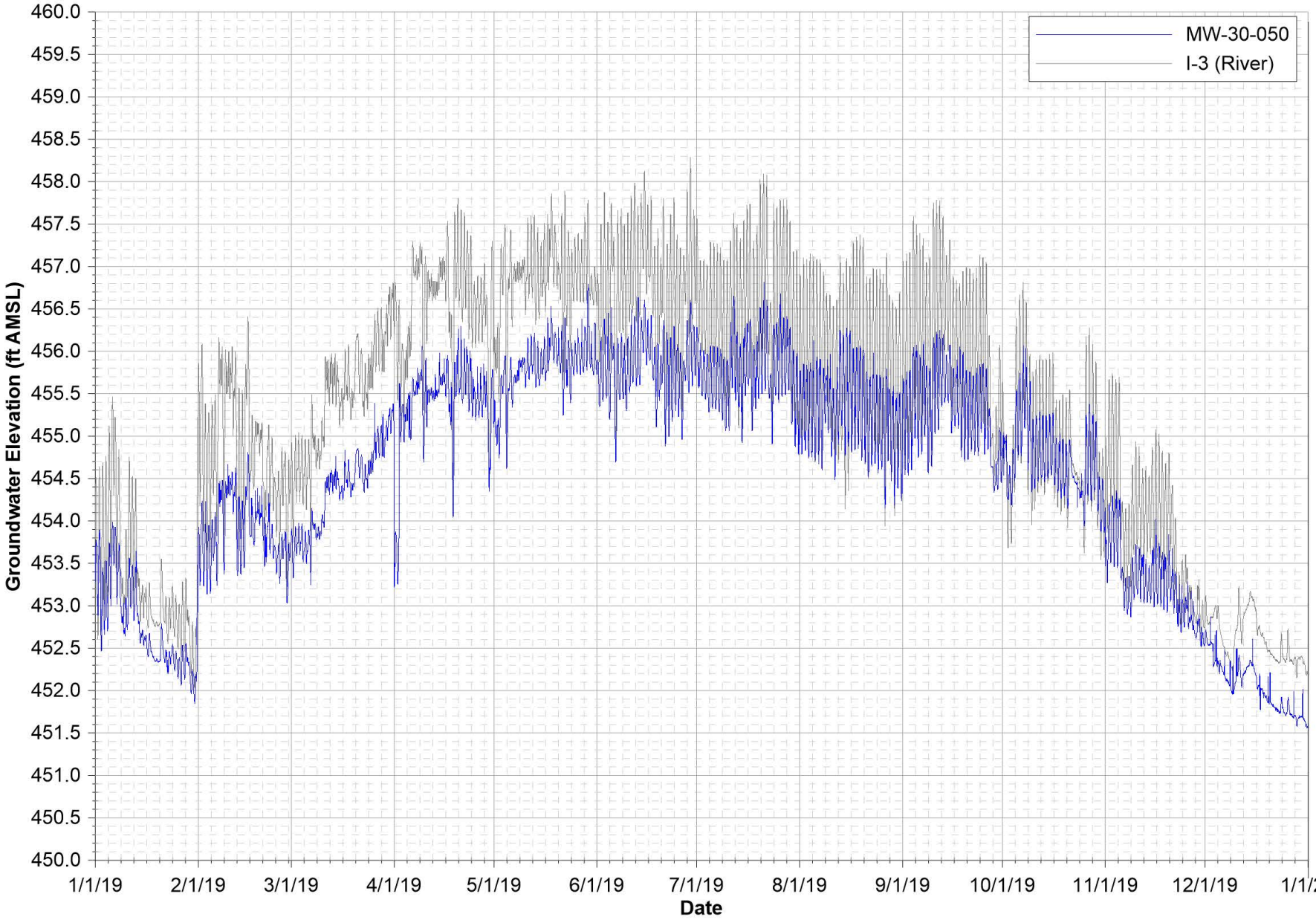
ARCADIS



Notes:
1. Data subject to review.
2. ft AMSL = feet above mean sea level.

FIGURE H-1D
MW-28 CLUSTER HYDROGRAPHS
FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS

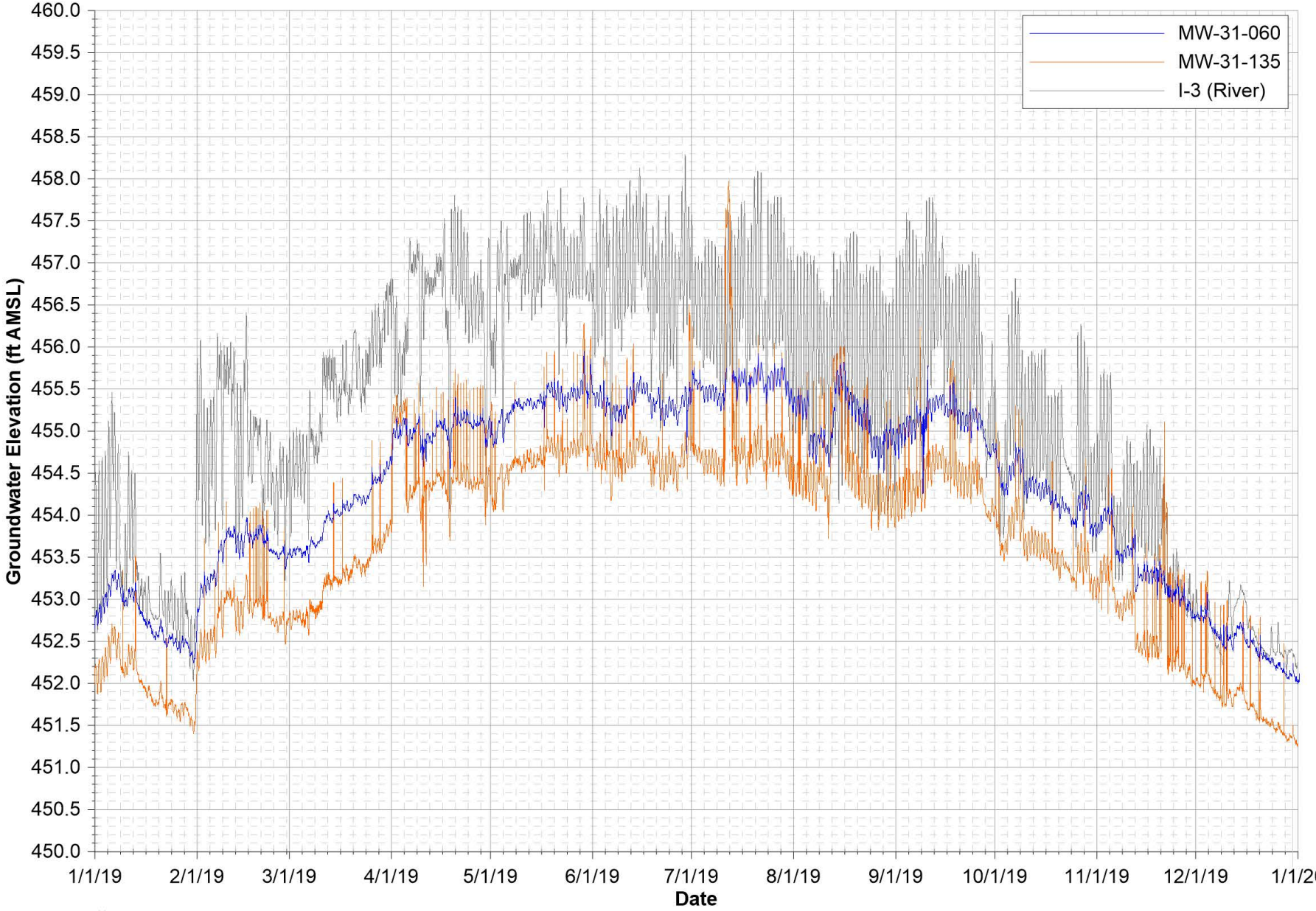


Notes:
1. Data subject to review.
2. ft AMSL = feet above mean sea level.

FIGURE H-1E
MW-30-050 HYDROGRAPH

FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS

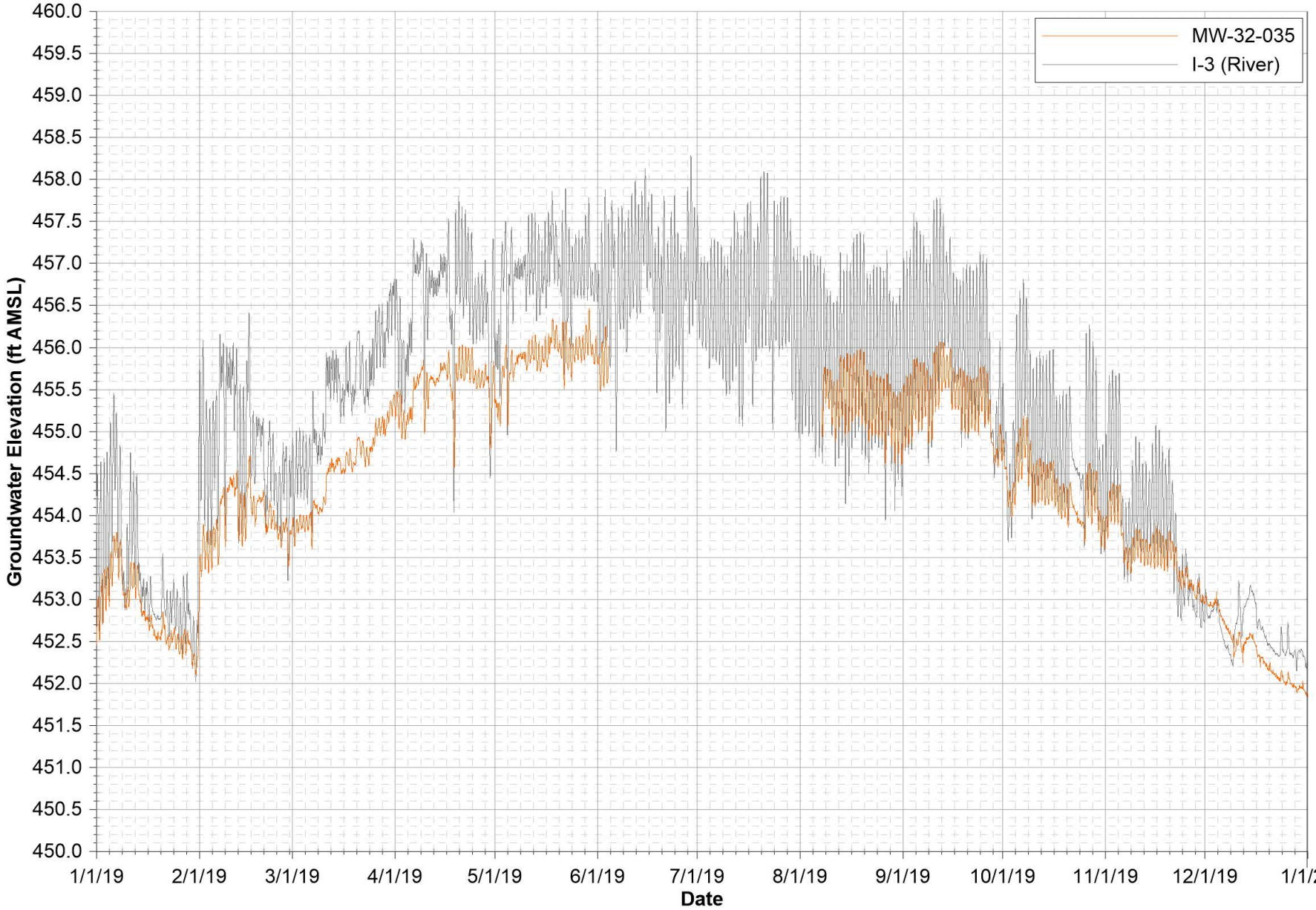


Notes:
1. Data subject to review.
2. ft AMSL = feet above mean sea level.
3. MW-31-060 data unavailable from July 11, 2019 through July 13, 2019 due to trandsucer malfunction.

FIGURE H-1F
MW-31 CLUSTER HYDROGRAPHS

FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

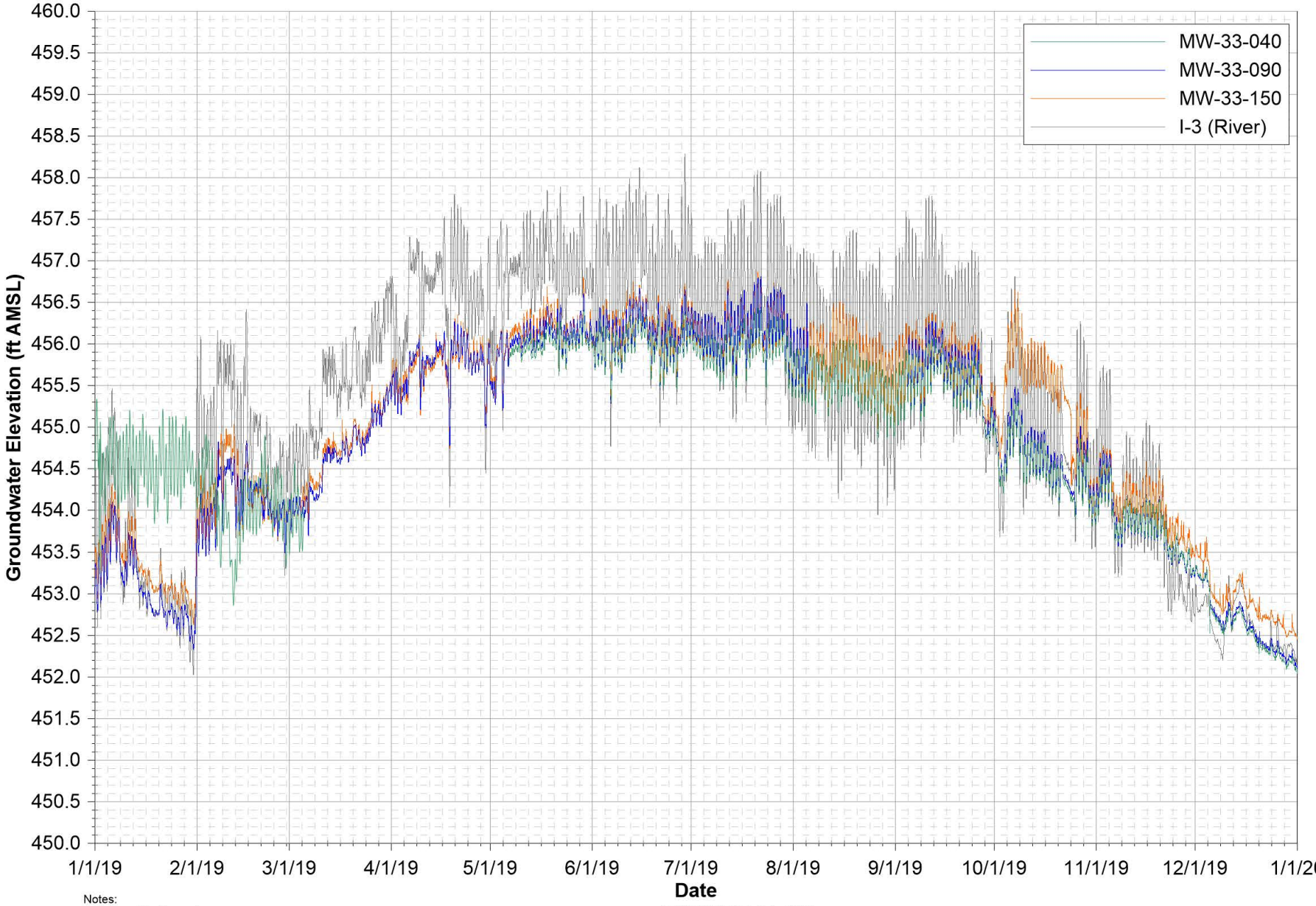
ARCADIS



Notes:
1. Data subject to review.
2. ft AMSL = feet above mean sea level.
3. MW-32-035 data unavailable from June 4, 2019 through August 7, 2019 due to transducer malfunction.

FIGURE H-1G
MW-32 HYDROGRAPH
FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS



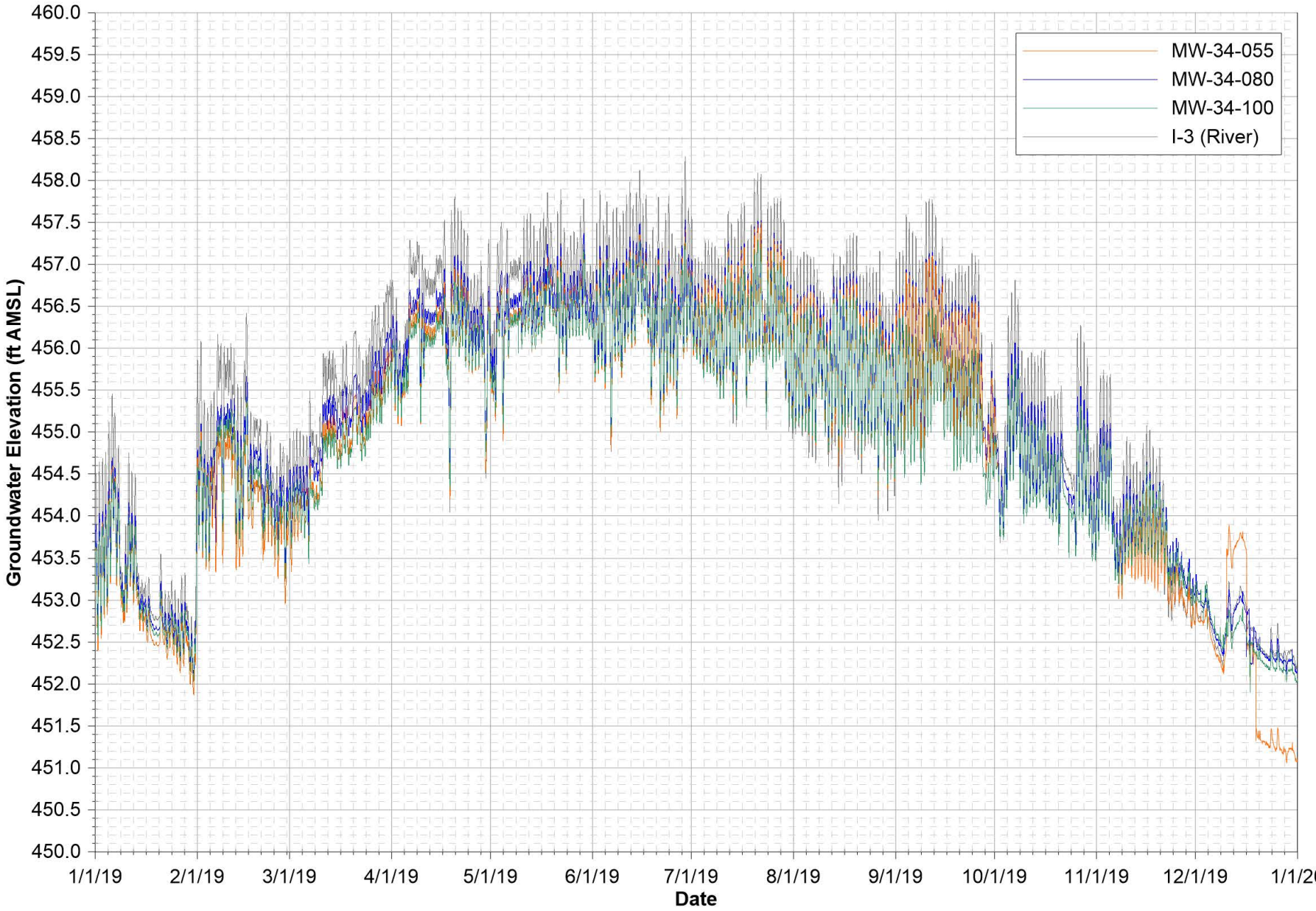
Notes:
1. Data subject to review.
2. ft AMSL = feet above mean sea level.
3. MW-33-040 data unavailable from March 5, 2019 through May 6, 2019 due to transducer malfunction.
4. MW-33-090 data unavailable from August 5, 2019 through September 4, 2019 due to transducer malfunction.

FIGURE H-1H

MW-33 CLUSTER HYDROGRAPHS

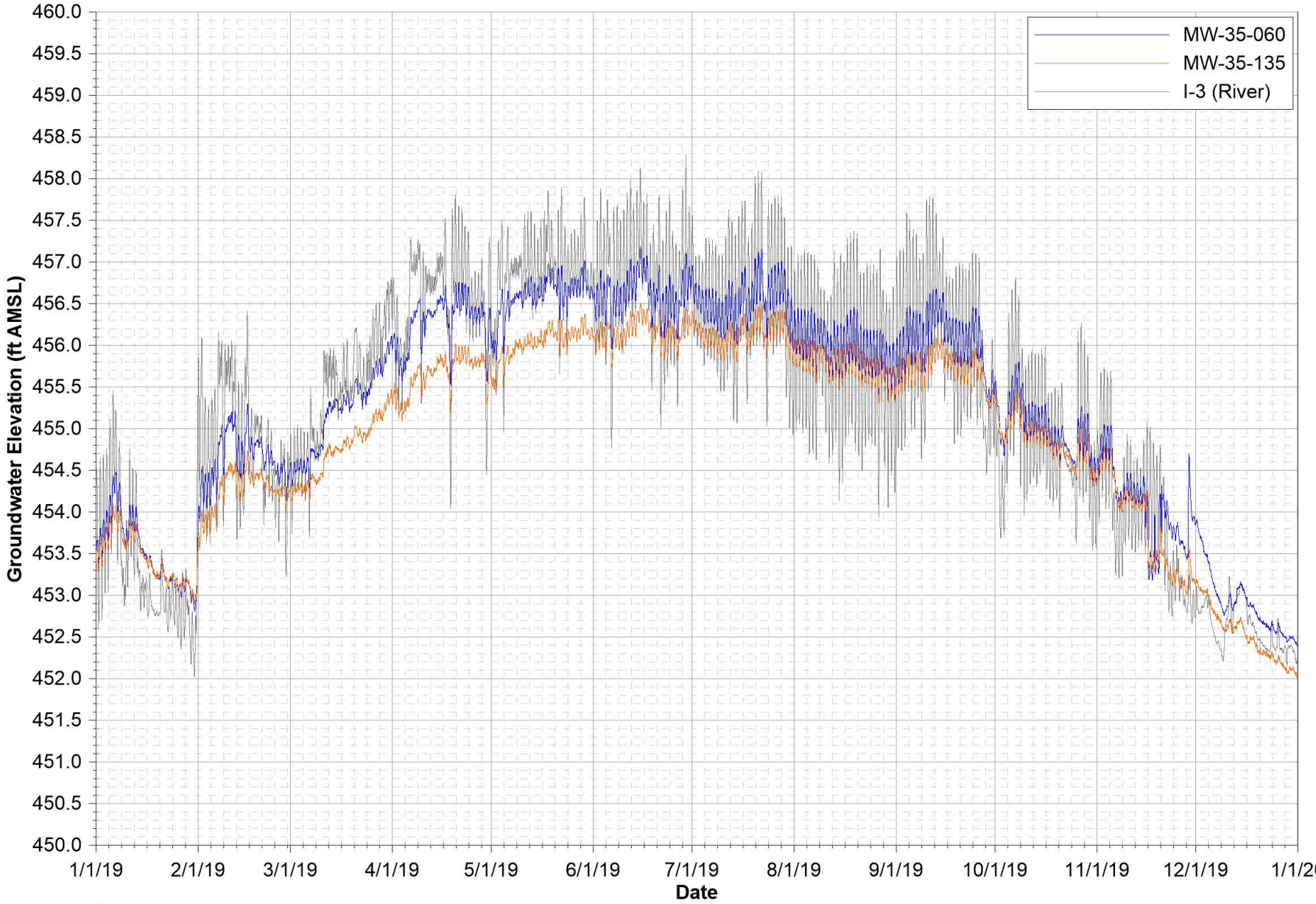
FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS



Notes:
1. Data subject to review.
2. ft AMSL = feet above mean sea level.
3. MW-34-055 data unavailable from October 2, 2019 through November 7, 2019 due to transducer malfunction.
4. MW-34-100 data unavailable from February 5, 2019 through February 6, 2019 due to transducer malfunction.

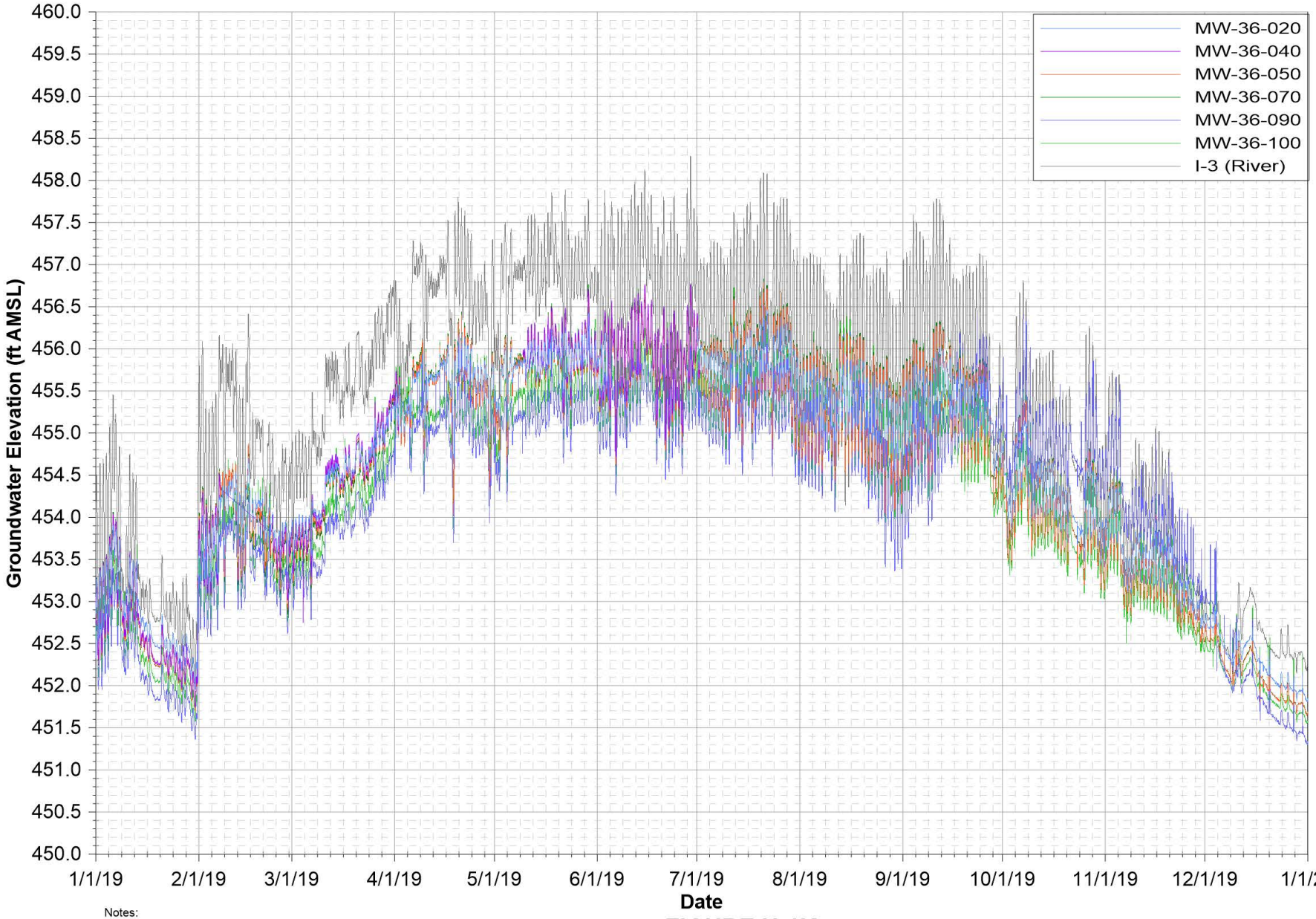
FIGURE H-1I
MW-34 CLUSTER HYDROGRAPHS
FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA



Notes:
1. Data subject to review.
2. ft AMSL = feet above mean sea level.

FIGURE H-1J
MW-35 CLUSTER HYDROGRAPHS
FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

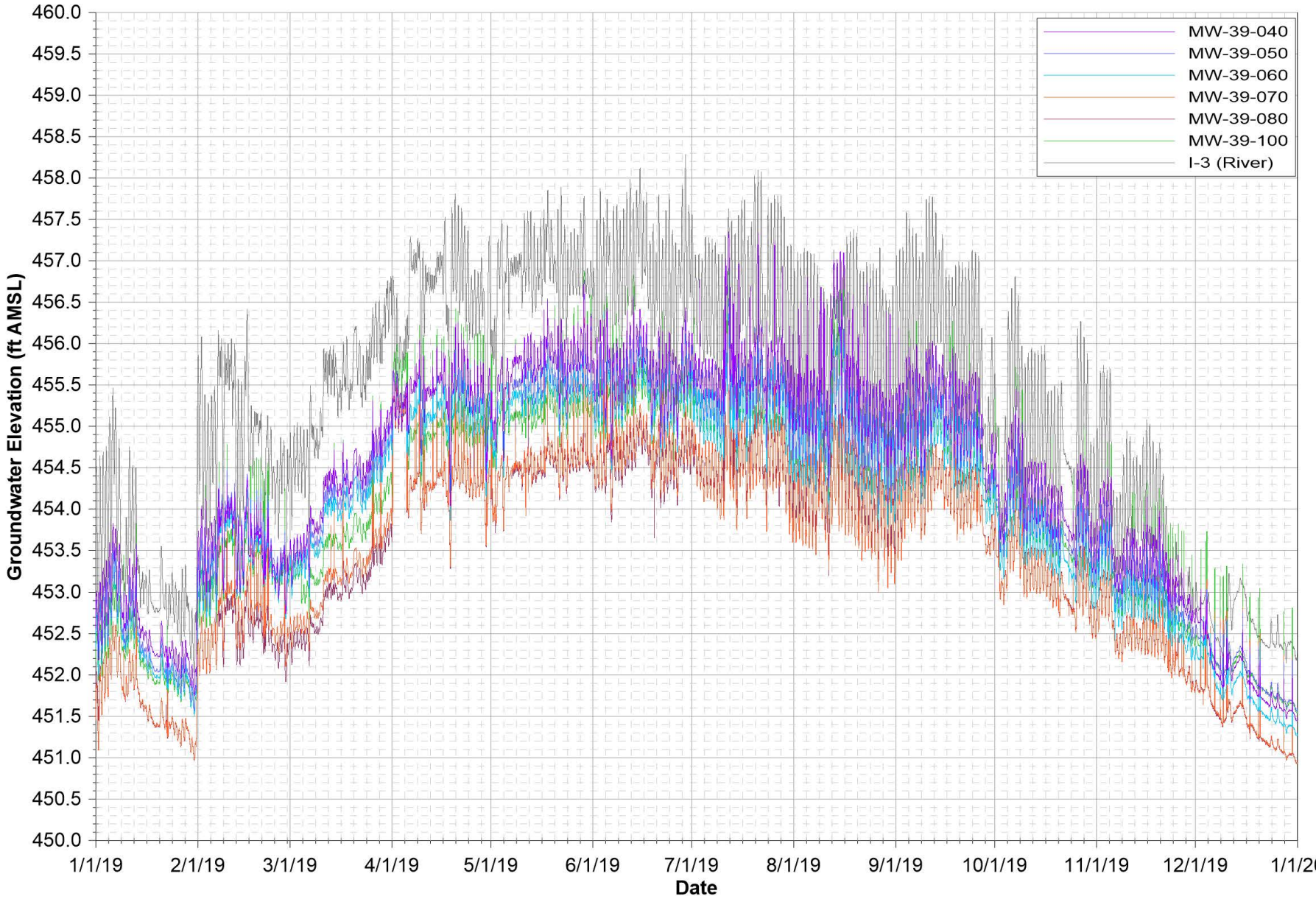
ARCADIS



Notes:
1. Data subject to review.
2. ft AMSL = feet above mean sea level.
3. MW-36-020 data unavailable from June 4, 2019 through June 30, 2019 due to transducer malfunction.
4. MW-36-040 data unavailable from April 2, 2019 through May 9, 2019 due to transducer malfunction.

FIGURE H-1K
MW-36 CLUSTER HYDROGRAPHS
FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

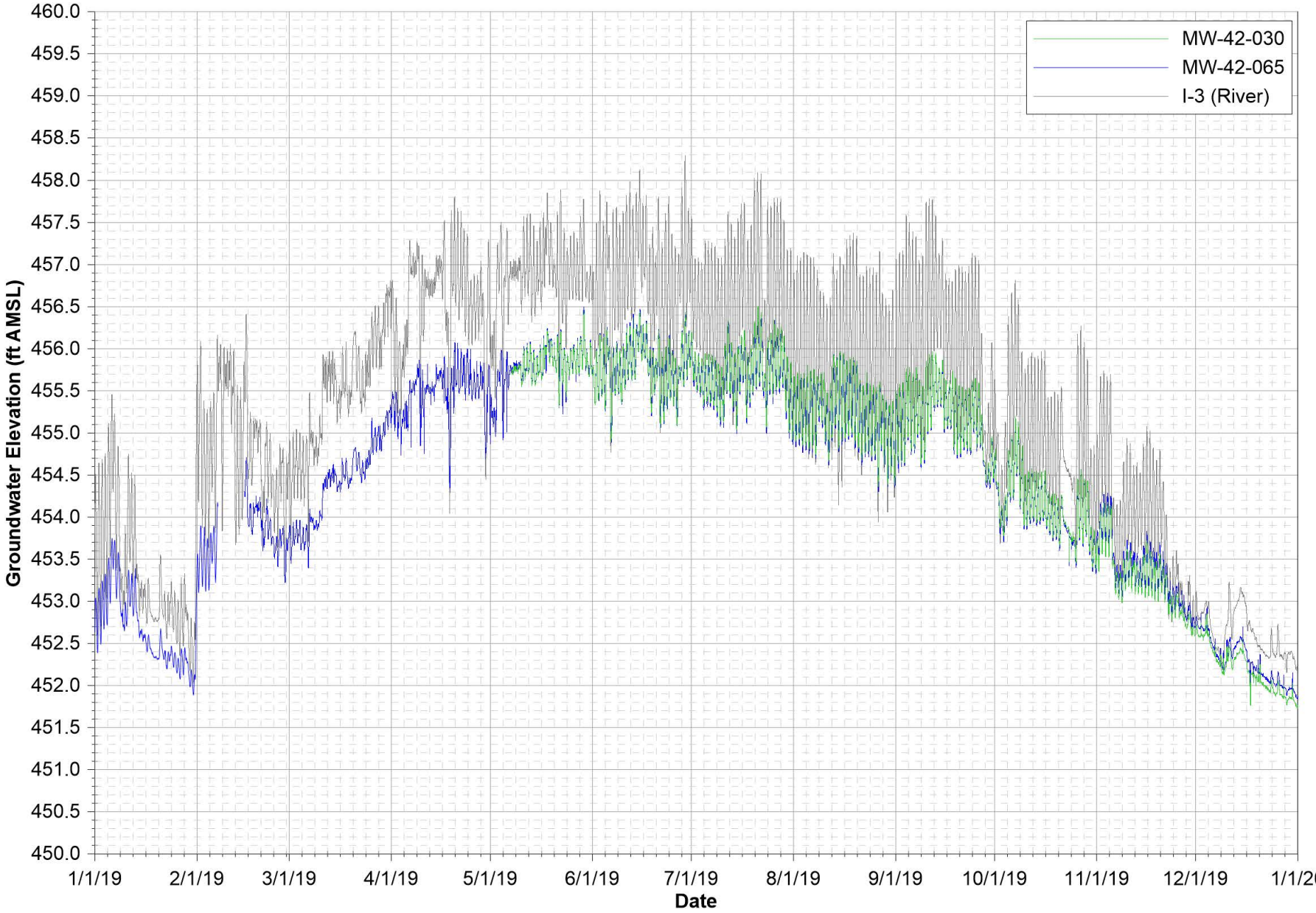
ARCADIS



Notes:
1. Data subject to review.
2. ft AMSL = feet above mean sea level.
3. MW-39-050 data unavailable from April 2, 2019 through May 7, 2019 due to transducer malfunction.

FIGURE H-1L
MW-39 CLUSTER HYDROGRAPHS
FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS

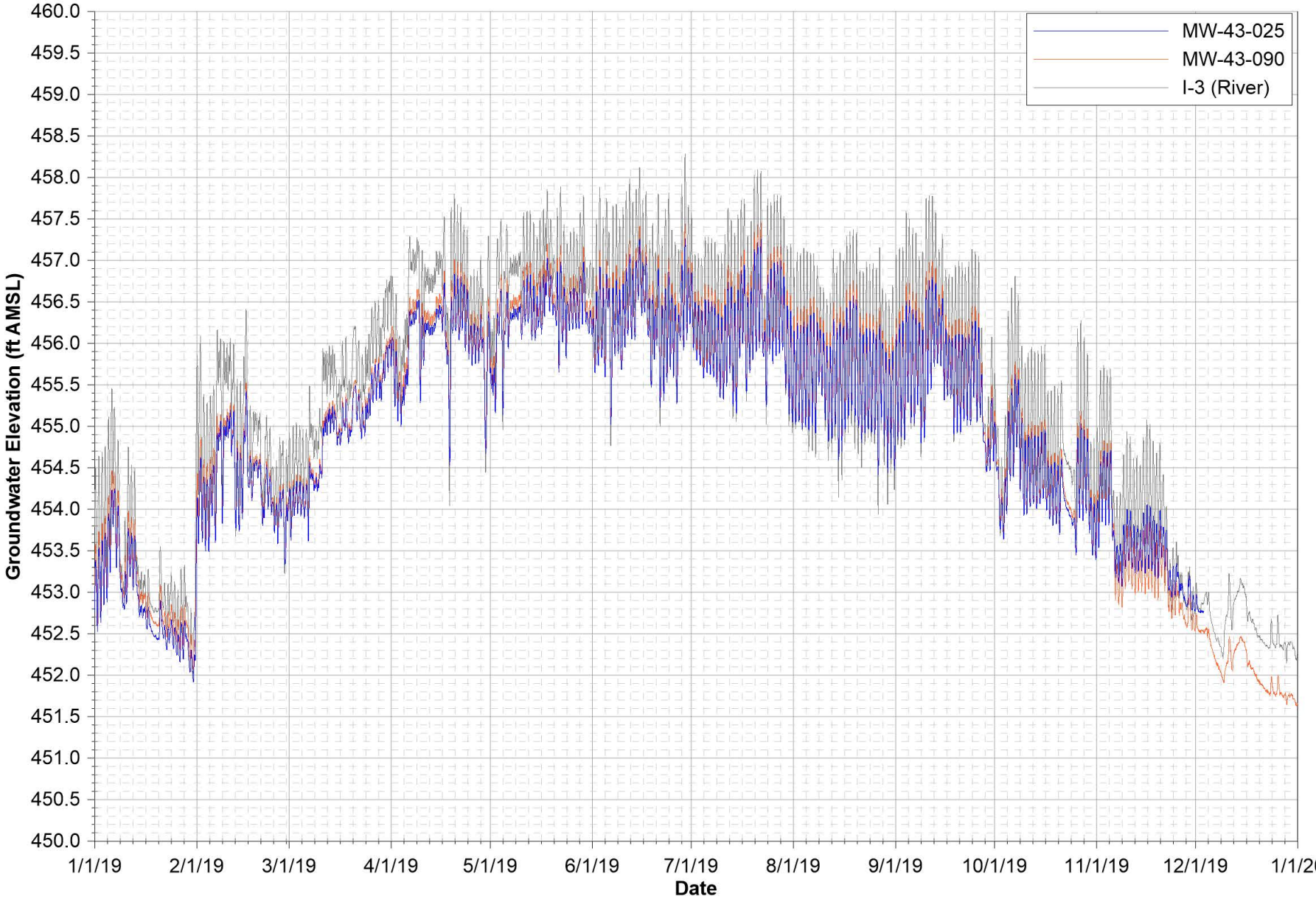


Notes:
1. Data subject to review.
2. ft AMSL = feet above mean sea level.
3. MW-42-030 data unavailable from January 1, 2019 through May 7, 2019 due to transducer malfunction.
4. MW-42-065 data unavailable from February 7, 2019 through February 15, 2019 due to transducer malfunction.

FIGURE H-1M
MW-42 CLUSTER HYDROGRAPHS

FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

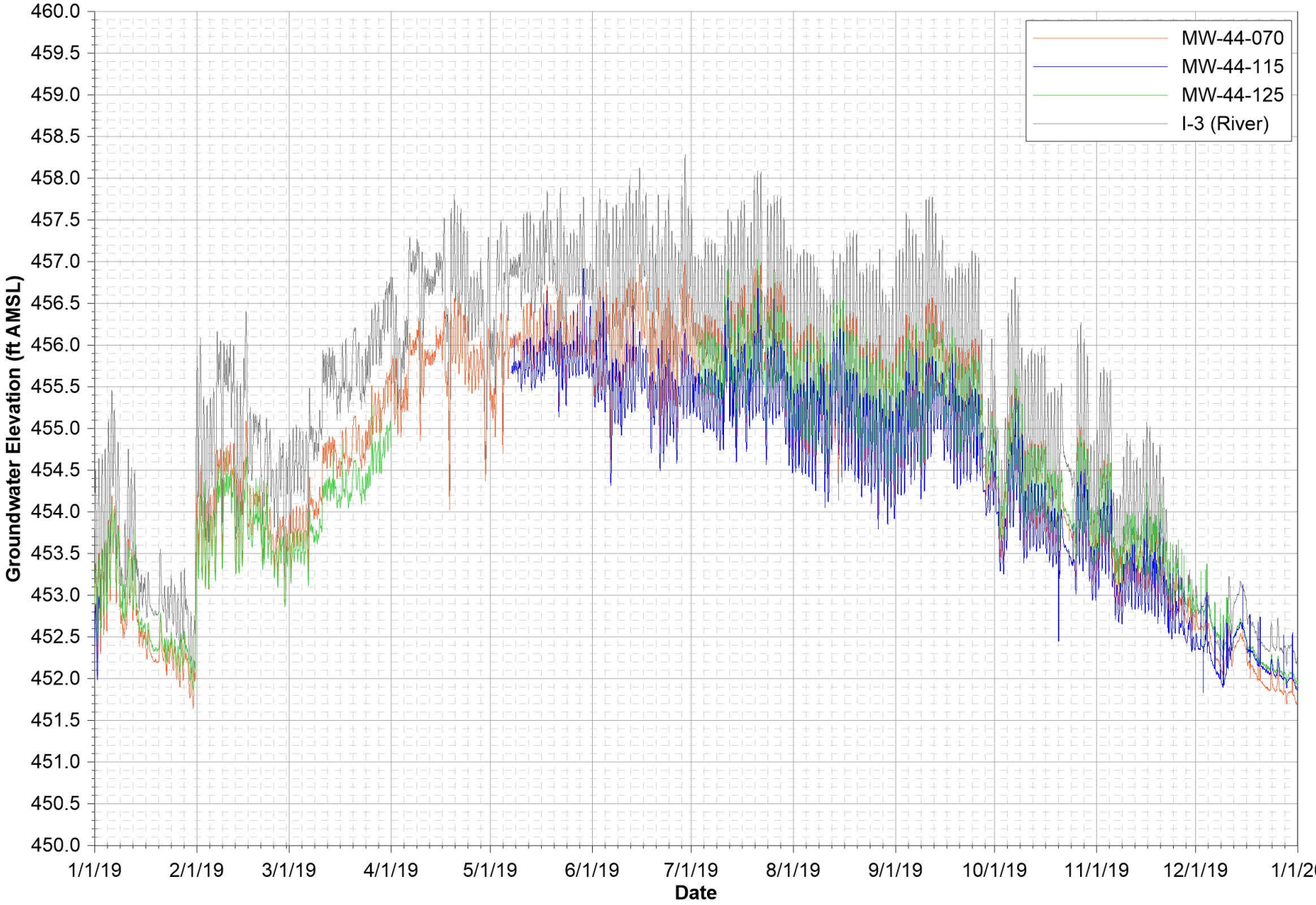
ARCADIS



Notes:
1. Data subject to review.
2. ft AMSL = feet above mean sea level.
3. MW-43-025 data unavailable from December 3, 2019 through December 31, 2019 due to transducer malfunction.

FIGURE H-1N
MW-43 CLUSTER HYDROGRAPHS
FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

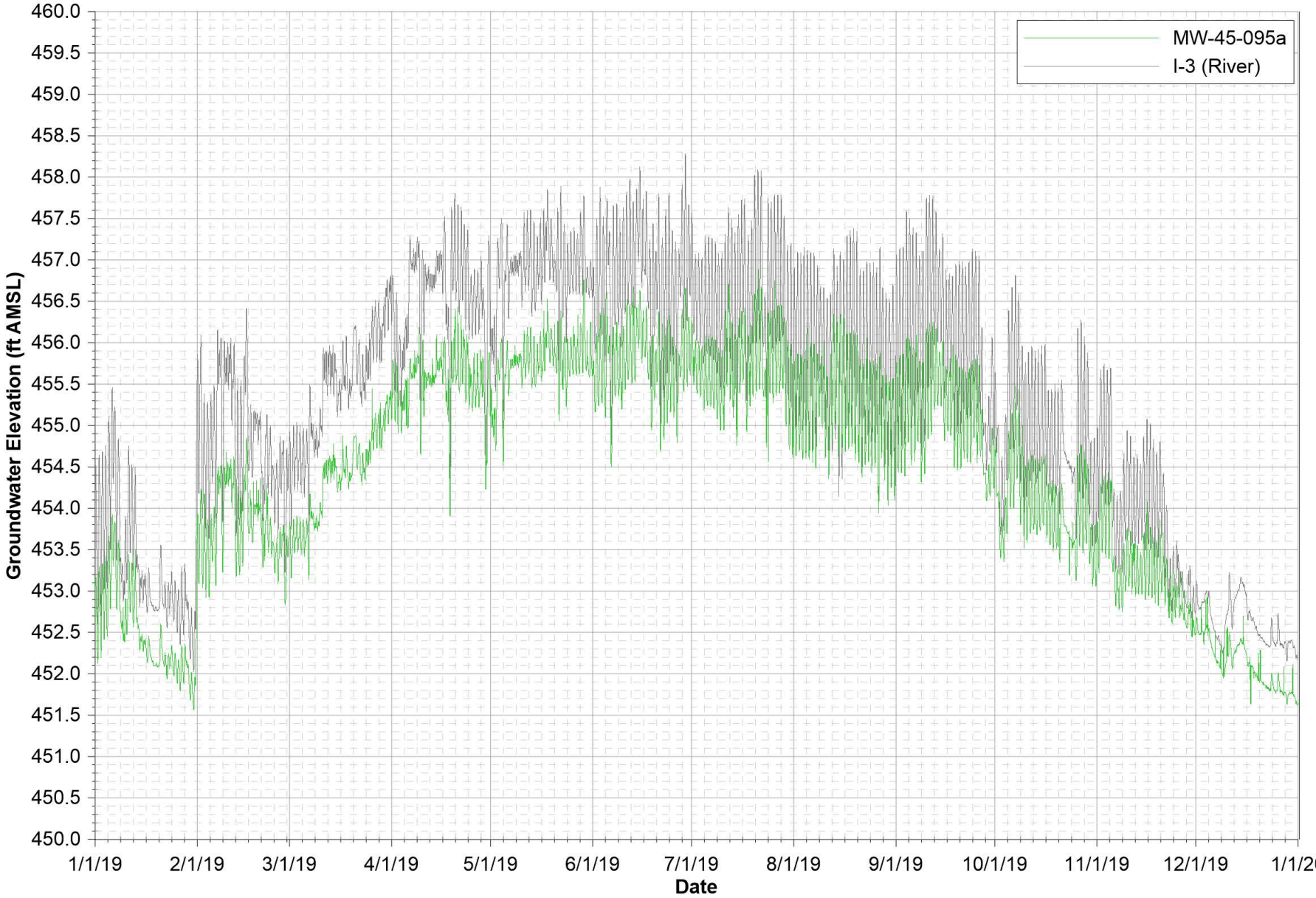
ARCADIS



Notes:
1. Data subject to review.
2. ft AMSL = feet above mean sea level.
3. MW-44-115 data unavailable from January 2, 2019 through May 7, 2019 due to transducer malfunction.
4. MW-44-125 data unavailable from April 1, 2019 through July 3, 2019 due to transducer malfunction.

FIGURE H-1O
MW-44 CLUSTER HYDROGRAPHS
FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

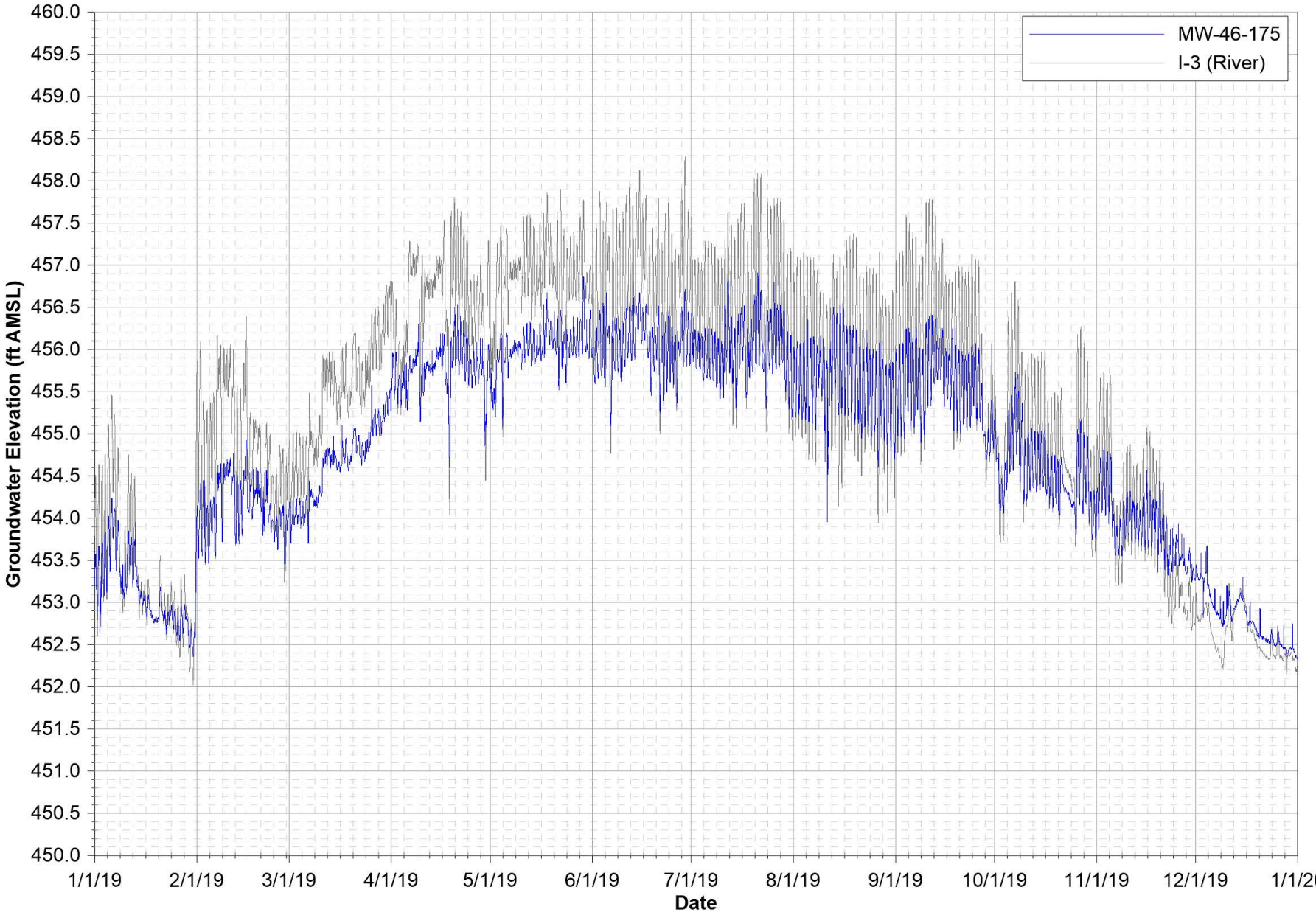
ARCADIS



Notes:
1. Data subject to review.
2. ft AMSL = feet above mean sea level.

FIGURE H-1P
MW-45-095a HYDROGRAPH
FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

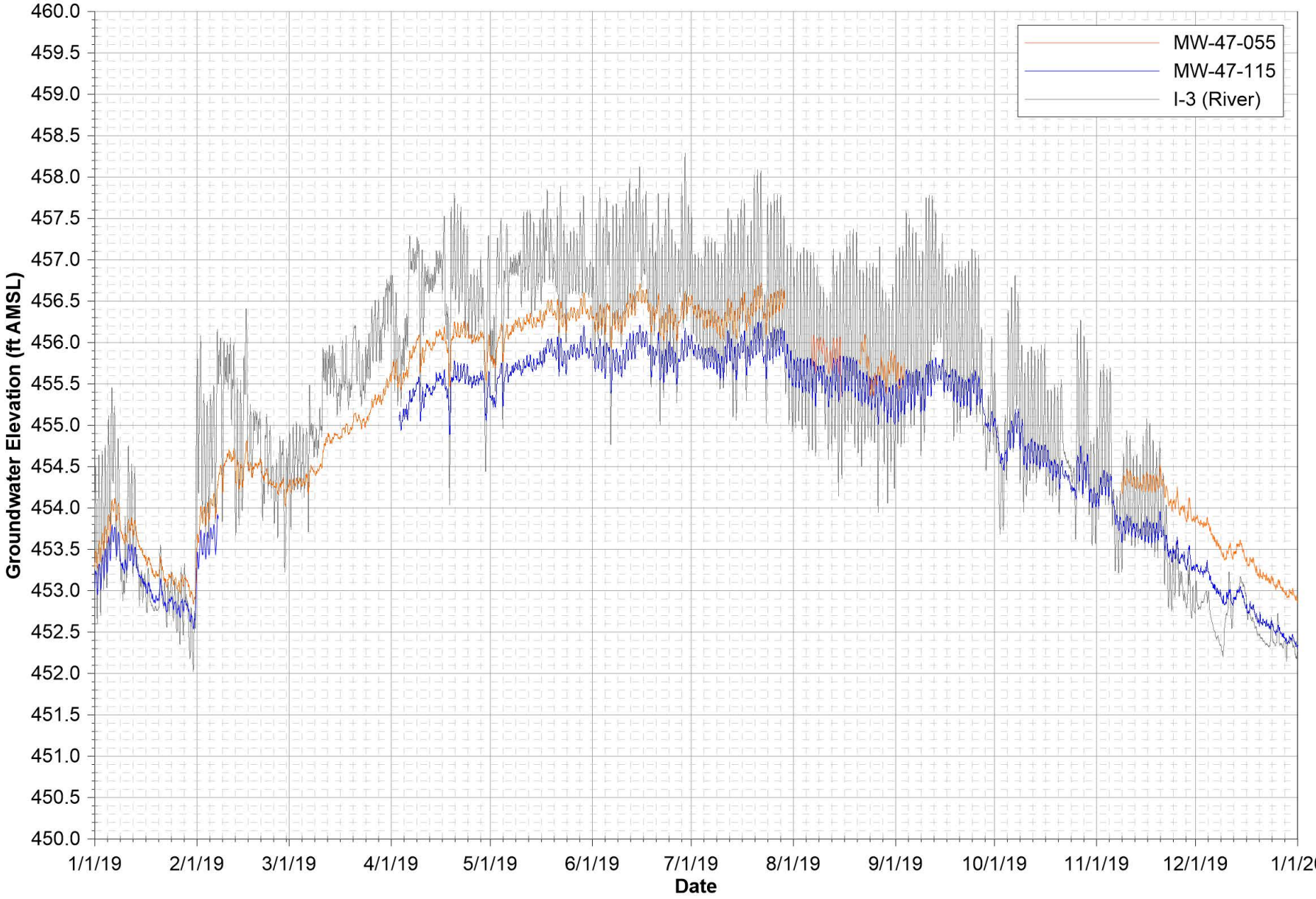
ARCADIS



Notes:
1. Data subject to review.
2. ft AMSL = feet above mean sea level.

FIGURE F-1Q
MW-46 HYDROGRAPH
FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

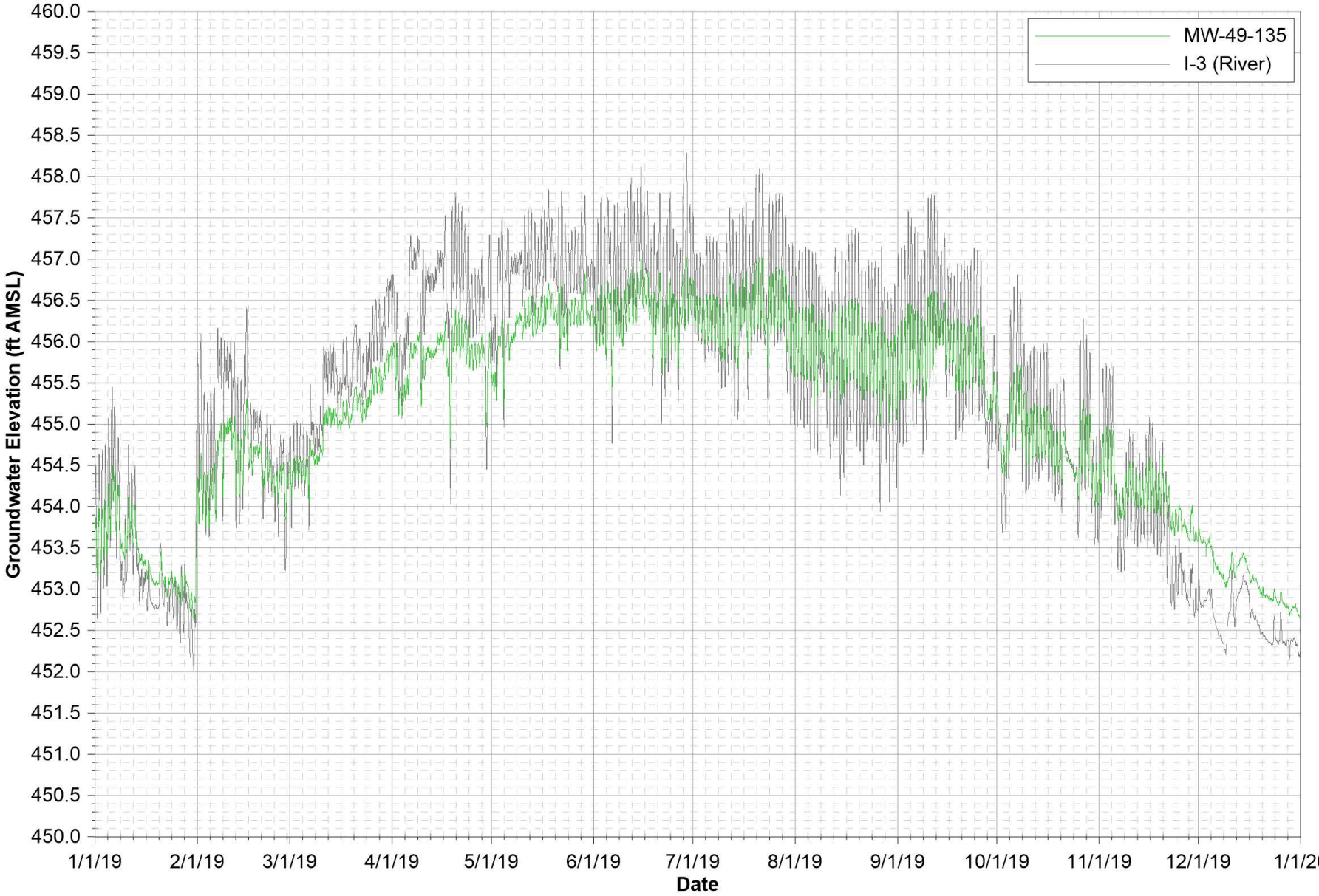
ARCADIS



Notes:
1. Data subject to review.
2. ft AMSL = feet above mean sea level.
3. MW-47-055 data unavailable from July 29, 2019 through August 6, 2019, from August 15, 2019 through August 20, 2019, and from September 3, 2019 through November 8, 2019 due to transducer malfunction.
4. MW-47-115 data unavailable from February7, 2019 through April 3, 2019 due to transducer malfunction.

FIGURE H-1R
MW-47 CLUSTER HYDROGRAPHS
FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

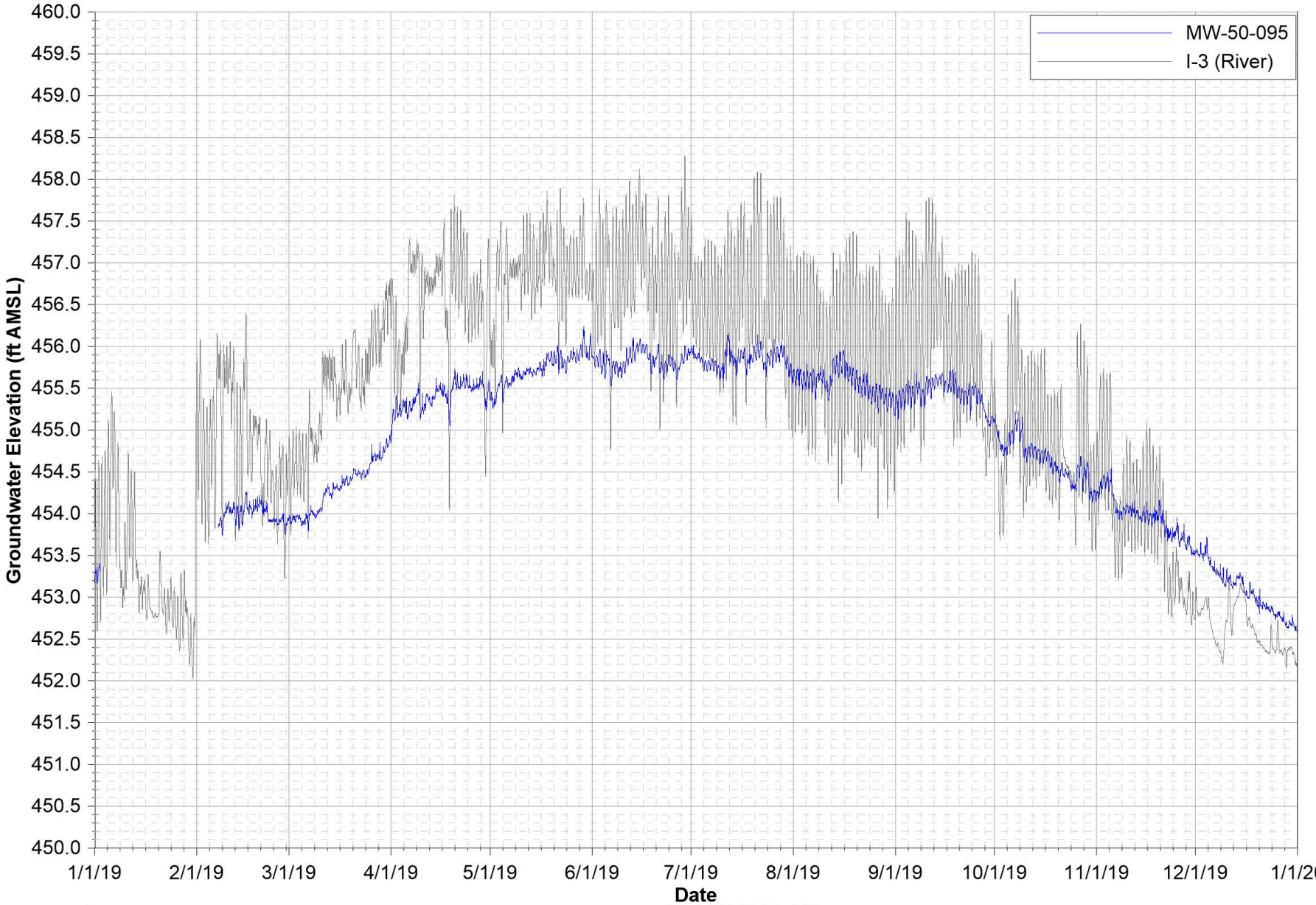
ARCADIS



Notes:
1. Data subject to review.
2. ft AMSL = feet above mean sea level.

FIGURE H-1S
MW-49 HYDROGRAPH
FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS



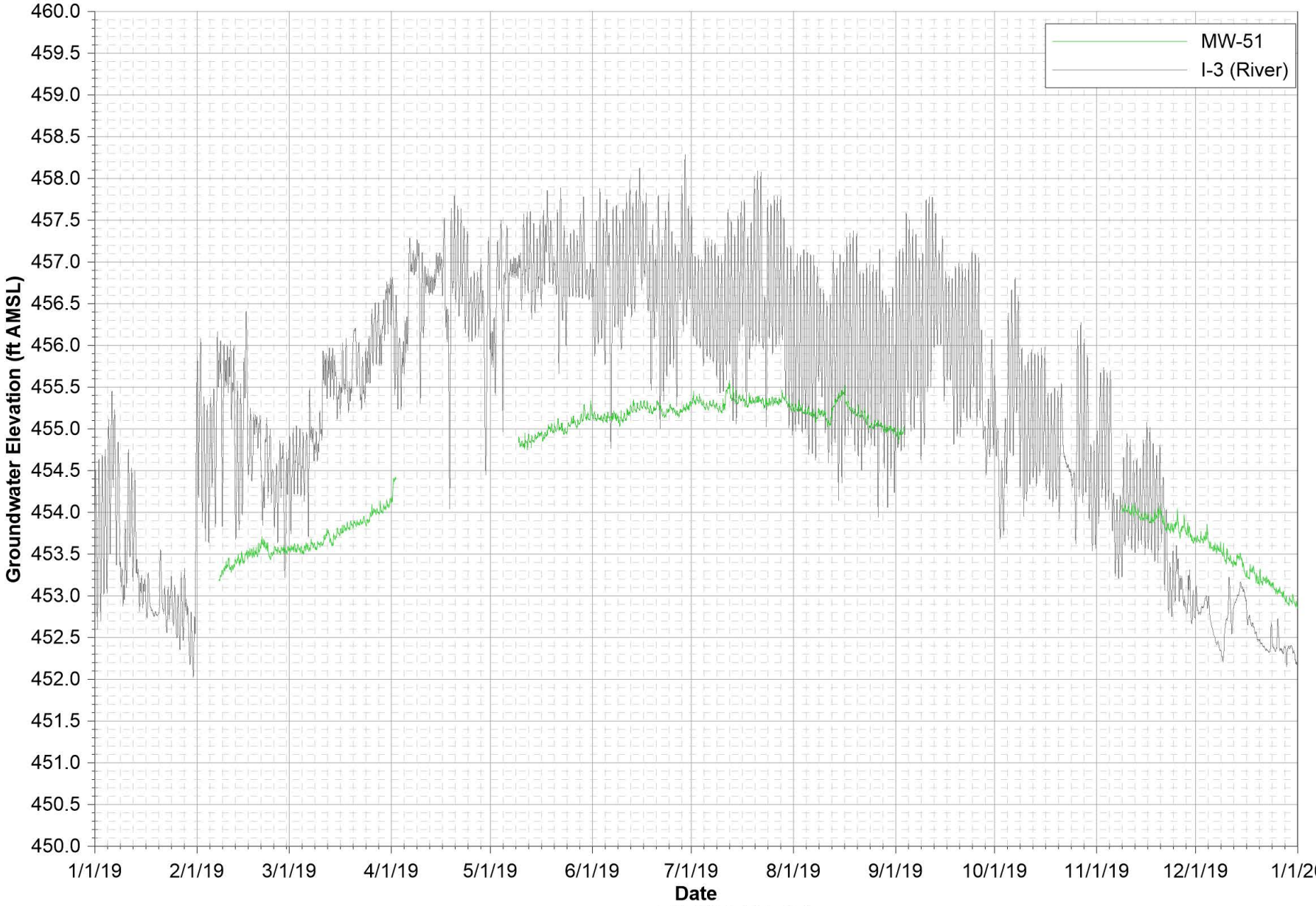
Notes:
1. Data subject to review.
2. ft AMSL = feet above mean sea level.
3. MW-50-095 data unavailable from January 2, 2019 through February 7, 2019 due to transducer malfunction.

FIGURE H-1T

MW-50 HYDROGRAPH

FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

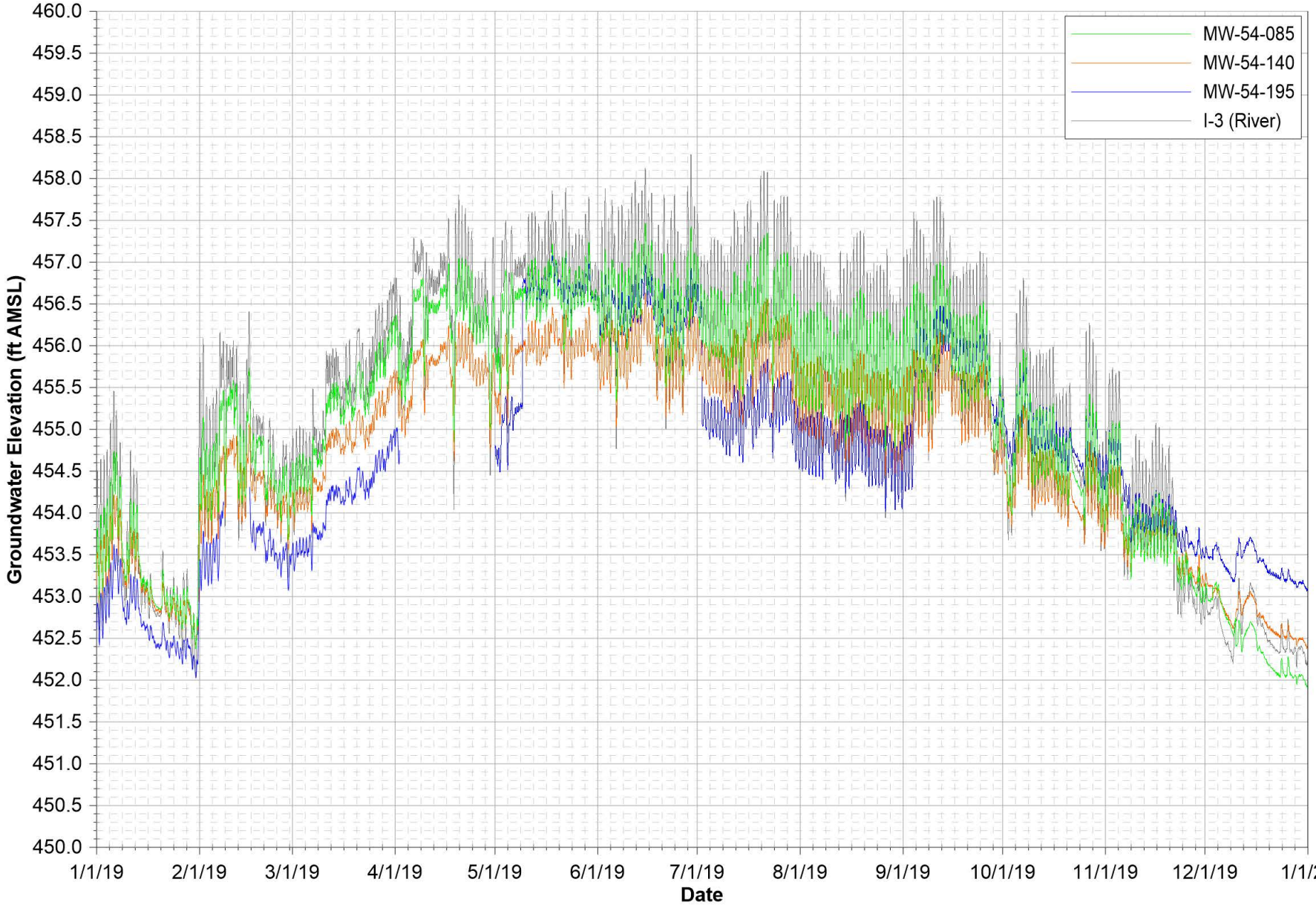
ARCADIS



Notes:
1. Data subject to review.
2. ft AMSL = feet above mean sea level.
3. MW-51 data unavailable from January 1, 2019 through February 7, 2019, from April 2, 2019 through May 9, 2019, and from September 3, 2019 through November 8, 2019 due to transducer malfunction.

FIGURE H-1U
MW-51 HYDROGRAPHS
FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

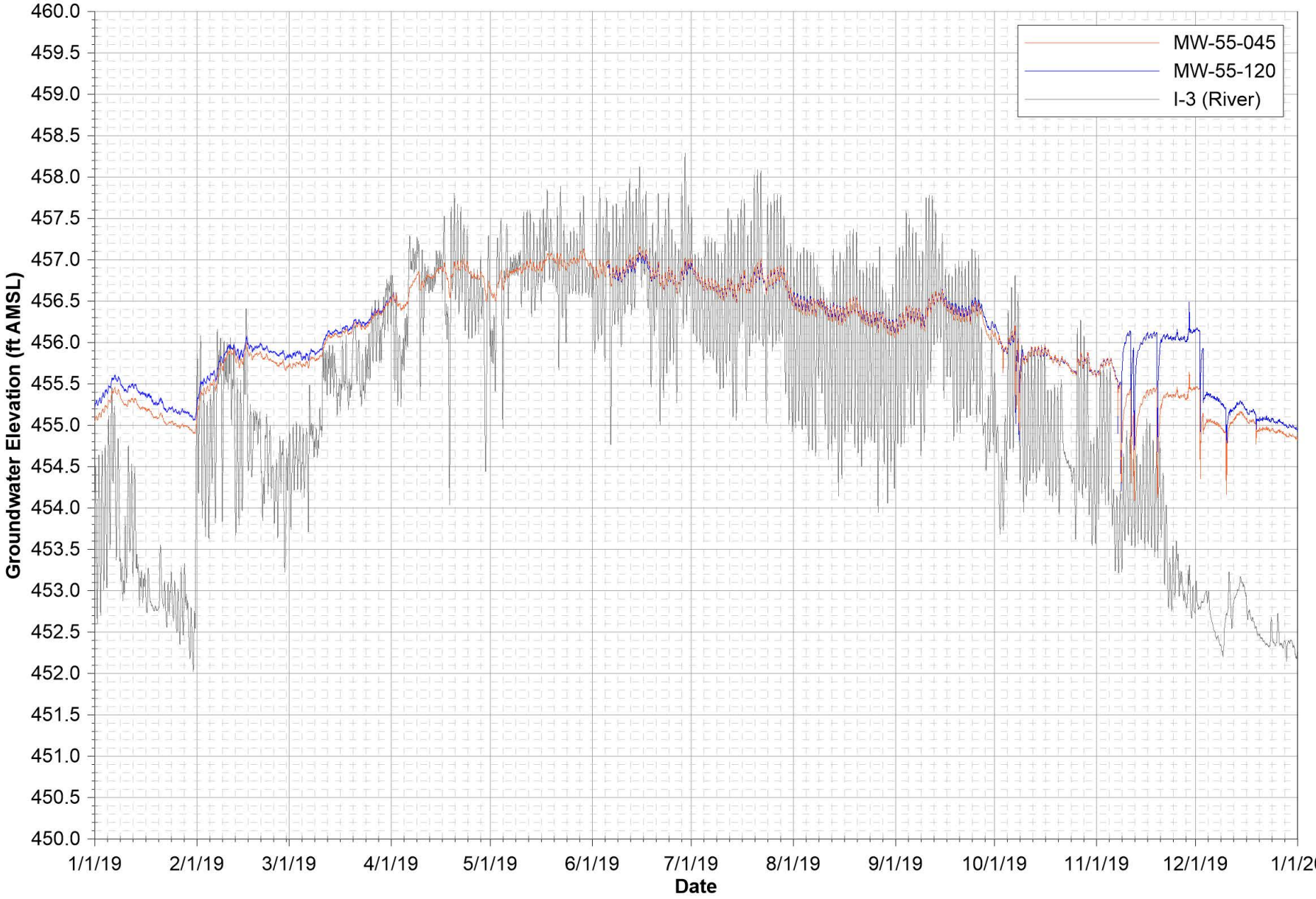
ARCADIS



Notes:
1. Data subject to review.
2. ft AMSL = feet above mean sea level.
3. MW-54-195 data unavailable from February 8, 2019 through February 16, 2019 and from April 2, 2019 through May 1, 2019 due to transducer malfunction.

FIGURE H-1V
MW-54 CLUSTER HYDROGRAPHS
FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT,
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

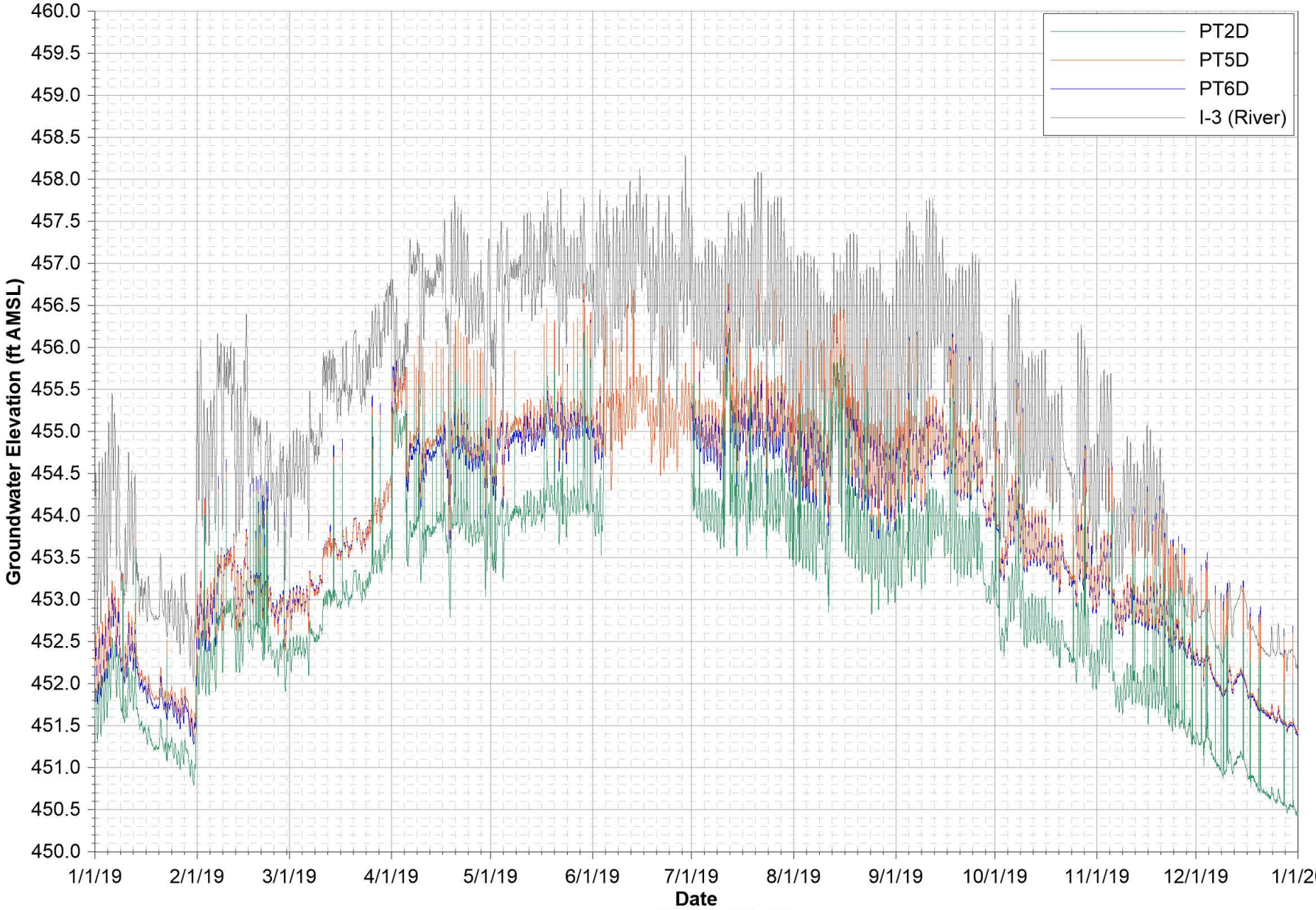
ARCADIS



Notes:
1. Data subject to review.
2. ft AMSL = feet above mean sea level.
3. MW-55-120 data unavailable from April 2, 2019 through June 5, 2019 due to transducer malfunction.

FIGURE H-1W
MW-55 CLUSTER HYDROGRAPHS
FOURTH QUARTER 2019 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.
3. PT2D data unavailable from June 4, 2019 through June 30, 2019 due to transducer malfunction.
4. PT6D data unavailable from June 4, 2019 through June 30, 2019 due to transducer malfunction.

FIGURE H-1X
INSITU PILOT STUDY WELL HYDROGRAPHS
FOURTH QUARTER 2019 AND ANNUAL INTERIM MEASURES PERFORMANCE MONITORING AND SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING REPORT, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

ARCADIS

APPENDIX I

Chemical Performance Monitoring Sampling Results, March 2005 through December 2019

Appendix I

Chemical Performance Monitoring Sampling Results, March 2005 through December 2019

Fourth Quarter 2019 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 Type	Sample Method	Boron, Dissolved (mg/L)	Bromide (mg/L)	Calcium, Dissolved (mg/L)	Chloride (mg/L)	Deuterium (‰)	Magnesium, Dissolved (mg/L)	Nitrate/Nitrite as Nitrogen (mg/L)	Oxygen-18 (‰)	Potassium, Dissolved (mg/L)	Sodium, Dissolved (mg/L)	Sulfate (mg/L)	Total Alkalinity as $CaCO_3$ (mg/L)	Total Dissolved Soilds (mg/L)
MW-20-070	SA	03/10/2005		3V	0.412	ND (1.0)	198	740	-59	55.4	--	-7.1	9.89	431	378	81.7	1,940
MW-20-070	SA	06/15/2005		3V	0.414	ND (1.0)	189	749	-60	55.4	--	-7	10.5	433	388	73.8	1,980
MW-20-070	SA	06/15/2005	FD	--	0.445	ND (1.0)	204	760	-57	60.7	--	-8.3	11.4	468	392	71.3	2,050
MW-20-070	SA	10/11/2005		3V	0.402	0.641	198	737	-57	49.9	--	-7.2	14.6	323	359	69.9	1,950
MW-20-070	SA	12/15/2005		3V	0.441	ND (1.0)	138	645	-49	42.3	--	-7.1	14.5	267	326	77.8	1,830
MW-20-070	SA	03/10/2006		3V	0.427	ND (0.5)	161	679	-54	48.6	--	-7.2	9.22	424	358	82.2	1,940
MW-20-070	SA	05/05/2006		3V	0.476	0.574	162	696	-55.9	49.2	--	-8.2	9.55	461	376	74.5	1,750
MW-20-070	SA	10/03/2006		3V	0.535	ND (5.0)	158	677	-60.4	47.6	--	-8.1	9.82	472	357	85	1,890
MW-20-070	SA	10/03/2006	FD	--	0.515	ND (5.0)	154	669	-60.5	45.9	--	-8.1	9.51	466	352	80	1,840
MW-20-070	SA	12/13/2006		3V	0.459	0.699	149	678	-61.2	44.3	--	-7.6	9.09	458	352	77.5	1,910
MW-20-070	SA	03/14/2007		3V	0.503	0.641	139	689	-64.3	42.2	--	-8.5	8.83	451	358	80	1,740
MW-20-070	SA	05/03/2007		3V	0.477	ND (1.0)	139	697	-66.7	41.2	--	-8.4	8.65	390	344	77.5	1,750
MW-20-070	SA	10/11/2007		3V	0.54	ND (1.0)	130	699	-63.9	39.1	--	-8.2	11	600	367	80	1,820
MW-20-070	SA	03/12/2008		3V	0.51	ND (1.0)	139	695	-65.2	41.2	--	-7.6	10.7	403	360	77	1,790
MW-20-070	SA	10/07/2008		3V	0.608	0.61	136	650	-64.4	37.9	--	-8.5	10.5	400	360	83	1,900
MW-20-070	SA	03/12/2009		3V	0.549	ND (1.0)	128	670	-60.82	40.2	--	-7.74	9.95	496	330	79	1,900
MW-20-070	SA	09/25/2009		3V	0.42	ND (2.5)	130	700	-66.43	33	--	-8.7	9.7	390	310	74	1,700
MW-20-070	SA	12/16/2010		3V	0.51	0.51	130	680	-62.3	33	--	-7.5	12	400	320	79	1,700
MW-20-070	SA	12/07/2011		3V	--	ND (0.5)	100	540	-61.9	25	--	-7.9	--	380	330	71	1,400
MW-20-070	SA	10/04/2012		3V	--	--	76.2	430	--	22.9	--	--	--	346	290	--	--
MW-20-070	SA	10/04/2012		H	--	--	71.1	420	--	19.9	--	--	--	327	280	--	--
MW-20-070	SA	10/04/2012		LF	--	--	72.7	430	--	20.9	--	--	--	342	270	--	--
MW-20-070	SA	11/27/2012		3V	0.484	ND (0.5)	79.2	450	-62.6	22.2	10.6	-7.8	8.07	350	290	89	1,400
MW-20-070	SA	11/27/2012		H	--	--	72.2	430	--	19.6	9.57	--	--	338	300	94	--
MW-20-070	SA	11/27/2012		LF	--	--	74.1	440	--	21.6	9.75	--	--	338	300	91	--
MW-20-070	SA	03/12/2013		3V	--	--	82.8	440	--	22.3	8.6	--	--	358	290	87	--
MW-20-070	SA	03/12/2013		H	--	--	65.5	380	--	16.1	7.54	--	--	336	270	100	--
MW-20-070	SA	03/12/2013		MPP	--	--	77.3	420	--	19.4	8.14	--	--	344	280	90	--
MW-20-070	SA	05/09/2013		3V	--	--	--	--	--	--	10.1 J	--	--	--	--	--	--
MW-20-070	SA	12/11/2013		3V	0.51	ND (0.5)	70	390	-63.88	17	8.05	-8.12	15	580	260	91	1,200
MW-20-070	SA	05/07/2014		3V	--	--	--	--	--	--	7.15	--	--	--	--	--	--
MW-20-070	SA	12/15/2014		LF	0.43	ND (0.5)	49	330	-63.1	12	7.7	-8.07	4.4	310	230	100	1,100
MW-20-070	SA	05/19/2015		LF	--	--	--	--	--	--	7.9	--	--	--	--	--	--
MW-20-070	SA	05/19/2015	FD	--	--	--	--	--	--	--	7.6	--	--	--	--	--	--
MW-20-070	SA	12/08/2015		LF	0.52	ND (1.0)	54	320	-61.7815	13	7.0	-7.97973	4.8	300	220	100	1,000
MW-20-070	SA	04/27/2016		LF	--	--	--	--	--	--	8.5	--	--	--	--	--	--
MW-20-070	SA	12/09/2016		LF	0.41	ND (0.5)	52 J	360	-61.8873	14 J	8.0	-7.85368	5.3	340	240	100	1,100
MW-20-070	SA	04/27/2017		LF	--	--	--	--	--	--	8.8	--	--	--	--	--	--
MW-20-070	SA	12/07/2017		LF	0.5	ND (0.5 J)	54	390	-60.7979	13	9.0	-7.97363	5.2	310	240	100	1,100
MW-20-070	SA	04/27/2018		LF	--	--	--	--	--	--	9.4	--	--	--	--	--	--
MW-20-070	SA	12/11/2018		LF	0.47	ND (0.5)	63	370	-61.33	16	2.8	-8.17	5.9	320	240	100	1,100
MW-20-070	SA	12/11/2018	FD	--	0.47	ND (0.5)	65	360	-62.93	16	4.7	-8.33	6.0	340	240	100	1,100
MW-20-070	SA	05/24/2019		LF	--	--	--	--	--	--	8.7	--	--	--	--	--	--
MW-20-070	SA	12/13/2019		LF	--	ND (1.0)	--	400	-59.86	19	11	-8.79	5.7	--	280	98	1,300
MW-20-100	MA	03/10/2005		3V	0.859	ND (1.0)	133	466	-49	19.8	--	-5.2	8.98	712	511	84.2	2,490
MW-20-100	MA	06/15/2005		3V	0.713	ND (1.0)	137	921	-46	21.3	--	-4.7	9.06	592	506	84	2,500
MW-20-100	MA	10/11/2005		3V	0.718	0.731	170	887	-48	23.7	--	-5.3	15.2	500	484	82.3	2,400
MW-20-100	MA	12/15/2005		3V	0.709	ND (1.0)	136	813	-40	21.4	--	-5.4	14.8	406	404	82.7	2,340
MW-20-100	MA	03/10/2006		3V	0.803	ND (0.5)	171	861	-50.3	27	--	-5.6	7.75	597	475	92.5	2,500
MW-20-100	MA	05/05/2006		3V	0.716	ND (1.0)	193	927	-46.4	32	--	-5.1	10.8	577	522	82.5	2,260
MW-20-100	MA	10/03/2006		3V	0.874	ND (5.0)	202	863	-51.5	34.4	--	-5.8	10.9 J	568	456	90	2,320
MW-20-100	MA	12/13/2006		3V	0.889	0.83	205	861	-54.4	32.2	--	-6.2	11.4	579	459	97.5	1,960
MW-20-100	MA	12/13/2006	FD	--	0.881	0.851	205	874	-54.5	32.2	--	-6.2	9.55	575	457	92.5	2,200

Appendix I

Chemical Performance Monitoring Sampling Results, March 2005 through December 2019

Fourth Quarter 2019 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 Type	Sample Method	Boron, Dissolved (mg/L)	Bromide (mg/L)	Calcium, Dissolved (mg/L)	Chloride (mg/L)	Deuterium (‰)	Magnesium, Dissolved (mg/L)	Nitrate/Nitrite as Nitrogen (mg/L)	Oxygen-18 (‰)	Potassium, Dissolved (mg/L)	Sodium, Dissolved (mg/L)	Sulfate (mg/L)	Total Alkalinity as $CaCO_3$ (mg/L)	Total Dissolved Soilds (mg/L)
MW-20-100	MA	03/14/2007		3V	0.715	0.785	194	847	-57.8	31.7	--	-6.8	9.9	521	477	87.5	2,180
MW-20-100	MA	05/03/2007		3V	0.699	ND (1.0)	209	879	-59.2	36	--	-7.3	12 J	559	493	87.5	2,300
MW-20-100	MA	05/03/2007	FD	--	0.686	ND (1.0)	208	888	-59.3	34.6	--	-6.7	9.63 J	532	484	87.5	2,330
MW-20-100	MA	10/10/2007		3V	0.81	ND (1.0)	190	858	-57.2	32	--	-7.2	15	560	468	92	2,160
MW-20-100	MA	03/12/2008		3V	0.702	ND (1.0)	218	827	-58.3	35.4	--	-6.9	11.9	469	442	870	2,470
MW-20-100	MA	10/08/2008		3V	0.669	ND (1.0)	215	760	-60.2	36.8	--	-7.9	10.3	453	420	90	2,200
MW-20-100	MA	03/13/2009		3V	0.89	ND (1.0)	213	770	-58.2	36.4	--	-7.08	11.6	543	420	97	2,200
MW-20-100	MA	09/25/2009		3V	0.7	ND (2.5)	200	750	-62.84	30	--	-7.67	12	430	400	89	2,000
MW-20-100	MA	02/10/2011		3V	0.81	0.57	180	610	-58.8	28	--	-7	14	400	380	120	1,800
MW-20-100	MA	12/08/2011		3V	--	ND (0.5)	170	580	-55.6	25	--	-6.7	--	390	380	120	1,700
MW-20-100	MA	10/04/2012		3V	--	--	157	570	--	27.8	--	--	--	400	390	--	--
MW-20-100	MA	10/04/2012		H	--	--	157	530	--	26.8	--	--	--	382	380	--	--
MW-20-100	MA	10/04/2012		LF	--	--	152	530	--	26.5	--	--	--	374	380	--	--
MW-20-100	MA	11/29/2012		3V	0.952	ND (0.5)	149	570	-56.6	30.6	12.9	-7	9.64	376	350	110	1,700
MW-20-100	MA	11/29/2012		H	--	--	142	530	--	25.2	14.2	--	--	350	360	99	--
MW-20-100	MA	11/29/2012		LF	--	--	142	540	--	25.2	14.1	--	--	374	350	100	--
MW-20-100	MA	03/13/2013		3V	--	--	164	560	--	27.8	6.27	--	--	388	370	120	--
MW-20-100	MA	03/13/2013		H	--	--	150	510	--	25.2	6.34	--	--	357	350	100	--
MW-20-100	MA	03/13/2013		MPP	--	--	155	500	--	25.7	6.5	--	--	365	360	110	--
MW-20-100	MA	05/09/2013		3V	--	--	--	--	--	--	14 J	--	--	--	--	--	--
MW-20-100	MA	12/11/2013		3V	1.0	ND (0.5)	140	550	-55.86	23	9.5	-7.46	8.2	400	290	110	1,600
MW-20-100	MA	05/07/2014		3V	--	--	--	--	--	--	11.1	--	--	--	--	--	--
MW-20-100	MA	12/15/2014		LF	0.76	ND (0.5)	120	530	-60.2	18	8.9	-7.62	6.4	340	260	120	1,500
MW-20-100	MA	05/19/2015		LF	--	--	--	--	--	--	9.6	--	--	--	--	--	--
MW-20-100	MA	12/08/2015		LF	0.92	ND (1.0)	120	510	-60.1171	20	7.3	-7.60373	7.0	340	240	110	1,300
MW-20-100	MA	04/27/2016		LF	--	--	--	--	--	--	8.6	--	--	--	--	--	--
MW-20-100	MA	12/09/2016		LF	0.83	0.62	110 J	500	-61.9035	19 J	8.1	-7.9278	7.2	330	250	130	1,300
MW-20-100	MA	04/27/2017		LF	--	--	--	--	--	--	8.7	--	--	--	--	--	--
MW-20-100	MA	12/08/2017		LF	0.88	0.57	110	480	-61.072	18	8.3	-8.08216	6.9	310	240	120 J	1,300
MW-20-100	MA	12/08/2017	FD	--	0.9	0.58	110	490	-60.7743	18	8.4	-8.10333	7.0	320	270	92 J	1,300
MW-20-100	MA	04/27/2018		LF	--	--	--	--	--	--	8.7	--	--	--	--	--	--
MW-20-100	MA	12/04/2018		LF	0.9	0.66	110	450	-63.4	19	6.4	-8.31	6.8	340	240	130	1,300
MW-20-100	MA	05/24/2019		LF	--	--	--	--	--	--	7.9	--	--	--	--	--	--
MW-20-100	MA	12/13/2019		LF	--	0.63	--	460	-64.58	20	6.7	-9.87	6.8	--	320	130	1,300
MW-20-130	DA	03/02/2005		G	--	--	--	--	--	--	--	--	--	--	--	--	5,270 J
MW-20-130	DA	03/09/2005		3V	1.9	ND (1.0)	219	3,120	-56	12.1	--	-5.8	24.7	2,250	1,080	68.9	5,520
MW-20-130	DA	03/09/2005	FD	--	1.99	ND (1.0)	231	3,080	-51	12.8	--	-5.4	25.4	2,390	1,080	68.9	6,200
MW-20-130	DA	06/15/2005		3V	2.75	ND (1.0)	352	3,410	-48	23.2	--	-5	31.3	2,980	1,230	68.7	7,790
MW-20-130	DA	10/07/2005		3V	2.41	1.04 J	349	3,010	-47	13.9	--	-5	38.4	2,070	1,210	72.4	7,330
MW-20-130	DA	12/16/2005		3V	1.98	ND (2.5)	324	3,260	-43	16.3	--	-5.8	44.4	1,780	1,000	63.2	7,860
MW-20-130	DA	03/10/2006		3V	2.03	ND (0.5)	312	3,370	-48.8	18.9	--	-5.5	27.7	2,730	1,250	74.5	8,610
MW-20-130	DA	05/05/2006		3V	2.4	ND (1.0)	349	3,900	-47.2	20.3	--	-5.3	27.7	2,810	1,280	69.2	7,700
MW-20-130	DA	10/18/2006		3V	2.28	ND (5.0)	358	3,680	-51.4	20.9	--	-6.3	28	2,870	1,100	70	8,450
MW-20-130	DA	12/13/2006		3V	2.31	0.896	335	3,970	-54.9	19.7	--	-6	27.6	2,900	1,250	72.5	7,890
MW-20-130	DA	12/13/2006	FD	--	2.24	1.09	328	3,950	-54.4	19.1	--	-5.9	27.3	2,830	1,260	72.5	8,250
MW-20-130	DA	03/08/2007		3V	2.24	1.08	353	3,930	-57.7	21.3	--	-6.5	27	2,760	1,240	70	8,450
MW-20-130	DA	03/08/2007	FD	--	2.19	1.06	351	3,900	-57.4	21.3	--	-6.6	26.8	2,750	1,210	72.5	8,510
MW-20-130	DA	05/03/2007		3V	2.49	ND (1.0)	338	4,020	-60	22.5	--	-7.7	27.8	2,550	1,310	75	8,150
MW-20-130	DA	05/03/2007	FD	--	2.47	ND (1.0)	338	3,950	-60.1	21.9	--	-6.9	27.3	2,550	1,290	72.5	8,100
MW-20-130	DA	10/05/2007		3V	2.4	ND (1.0)	310	3,670	-57.5	19	--	-7	31	2,900	1,070	77	7,980
MW-20-130	DA	03/12/2008		3V	2.07	ND (1.0)	342	3,690	-58.7	23.4	--	-6.2	47	2,260	1,220	75	8,460
MW-20-130	DA	10/08/2008		3V	2.23	ND (2.5)	329	3,500	-59.6	22	--	-7.3	40.1	1,990	1,200	81	7,800
MW-20-130	DA	03/13/2009		3V	2.16	ND (2.5)	350	3,600	-56.41	22.7	--	-6.58	41.4	2,550	1,100	79	8,100

Appendix I

Chemical Performance Monitoring Sampling Results, March 2005 through December 2019

Fourth Quarter 2019 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 Type	Sample Method	Boron, Dissolved (mg/L)	Bromide (mg/L)	Calcium, Dissolved (mg/L)	Chloride (mg/L)	Deuterium (‰)	Magnesium, Dissolved (mg/L)	Nitrate/Nitrite as Nitrogen (mg/L)	Oxygen-18 (‰)	Potassium, Dissolved (mg/L)	Sodium, Dissolved (mg/L)	Sulfate (mg/L)	Total Alkalinity as $CaCO_3$ (mg/L)	Total Dissolved Soilds (mg/L)
MW-20-130	DA	09/25/2009		3V	2.0	ND (2.5)	280	3,500	-61.74	17	--	-7.59	33	2,400	1,100	76	6,500
MW-20-130	DA	02/10/2011		3V	2.2	1.0	310	3,100	-59	18	--	-6.6	50	2,100	1,100	80	5,900
MW-20-130	DA	12/09/2011		3V	2.4	ND (2.5)	340	3,300	-57.2	22	--	-6.6	33	2,400	1,200	74	6,200
MW-20-130	DA	10/09/2012		3V	--	--	283	3,200	--	19.1	--	--	--	2,140	1,100	79	--
MW-20-130	DA	10/09/2012		H	--	--	282	2,700	--	23.6	--	--	--	1,890	1,100	86	--
MW-20-130	DA	10/09/2012		LF	--	--	294	2,400	--	25.8	--	--	--	1,630	1,100	92	--
MW-20-130	DA	11/29/2012		3V	2.13	ND (2.5)	286	3,300	-59.5	24	14.1	-6.6	32.7	2,310	1,100	80	7,400
MW-20-130	DA	11/29/2012		H	--	--	281	--	--	26.2	17.9	--	--	1,970	--	--	--
MW-20-130	DA	11/29/2012		LF	--	--	280	2,400	--	28.7	19.4	--	--	1,750	1,000	98	--
MW-20-130	DA	11/29/2012	FD	--	2.06	ND (2.5)	284	3,400	-60.4	24.2	14.1	-6.6	32.9	2,410	1,100	79	7,400
MW-20-130	DA	11/29/2012	FD	--	--	--	293	--	--	26.3	17.7	--	--	1,940	--	--	--
MW-20-130	DA	11/29/2012	FD	--	--	--	315	2,400	--	29.2	18.6	--	--	1,780	1,000	96	--
MW-20-130	DA	12/12/2012		H	--	--	--	3,000	--	--	--	--	--	--	1,100	83	--
MW-20-130	DA	12/12/2012	FD	--	--	--	--	3,000	--	--	--	--	--	--	1,100	81	--
MW-20-130	DA	03/14/2013		3V	--	--	311	3,400	--	21.7	6.32	--	--	2,260	1,100	76	--
MW-20-130	DA	03/14/2013		H	--	--	315	3,000	--	25	6.9	--	--	2,100	1,100	100	--
MW-20-130	DA	03/14/2013		MPP	--	--	331	2,600	--	30.9	7.91	--	--	1,760	1,000	90	--
MW-20-130	DA	05/14/2013		3V	--	--	--	--	--	--	13	--	--	--	--	--	--
MW-20-130	DA	12/17/2013		3V	2.3	ND (1.0)	330	3,200	-57.69	22	12.4	-6.4	26	2,300	1,100	80	7,400
MW-20-130	DA	12/17/2013	FD	--	2.7	ND (1.0)	330	3,200	-59.15	21	12.9	-6.52	27	2,400	1,100	78	7,300
MW-20-130	DA	05/12/2014		3V	--	--	--	--	--	--	12.9	--	--	--	--	--	--
MW-20-130	DA	12/15/2014		LF	1.9	ND (2.5)	310	2,800	-59.6	21	14	-6.7	24	1,800	1,100	85	6,900
MW-20-130	DA	12/15/2014	FD	--	1.8	ND (2.5)	290	2,900	-59.6	20	15	-6.76	21	1,700	1,100	85	6,800
MW-20-130	DA	05/19/2015		LF	--	--	--	--	--	--	14	--	--	--	--	--	--
MW-20-130	DA	12/08/2015		LF	2.5	ND (2.5)	320	3,300	-58.0354	19	12	-6.41678	25	2,400	1,000	76	7,100
MW-20-130	DA	12/08/2015	FD	--	2.6	ND (2.5)	320	3,100	-58.2233	19	13	-6.62848	25	2,400	1,100	80	6,600
MW-20-130	DA	04/27/2016		LF	--	--	--	--	--	--	10	--	--	--	--	--	--
MW-20-130	DA	12/09/2016		LF	2.3	ND (2.5)	260 J	3,400	-60.0955	16 J	12	-6.88176	30	2,600	1,100	77	7,000
MW-20-130	DA	12/09/2016	FD	--	2.4	ND (2.5)	250 J	3,400	-60.3119	14 J	11	-6.81648	31	2,700	1,100	79	7,100
MW-20-130	DA	04/27/2017		LF	--	--	--	--	--	--	11	--	--	--	--	--	--
MW-20-130	DA	04/27/2017	FD	--	--	--	--	--	--	--	11	--	--	--	--	--	--
MW-20-130	DA	12/07/2017		LF	2.1	ND (2.5)	240	2,500	-58.7852	22	15	-6.81531	22	1,600	1,000	98	5,500
MW-20-130	DA	04/27/2018		LF	--	--	--	--	--	--	11	--	--	--	--	--	--
MW-20-130	DA	12/04/2018		LF	2.3	ND (2.5)	280	3,000	-59.85	18	8.8	-7.2	27	2,200	990	85	6,400
MW-20-130	DA	05/24/2019		LF	--	--	--	--	--	--	11	--	--	--	--	--	--
MW-20-130	DA	05/24/2019	FD	--	--	--	--	--	--	--	11	--	--	--	--	--	--
MW-20-130	DA	12/13/2019		LF	--	ND (2.5)	--	3,500	-59.67	25 J	13	-7.87	29	3,100	990	85	7,900
MW-25	SA	03/09/2005		3V	0.441	ND (0.5)	77.6	247	-62	16.1	--	-8.4	6.24	211	169	158	877
MW-25	SA	06/14/2005		3V	0.464	ND (0.5)	93.5	289	-61	20	--	-8.6	8.91	253	183	137	942
MW-25	SA	06/14/2005	FD	--	0.475	ND (0.5)	100	294	-59	20.9	--	-7.2	9.06	268	185	137	980
MW-25	SA	10/04/2005		3V	0.362	ND (0.5)	83.3	252	-68	14.9	--	-8.2	9.93	164	171	141	950
MW-25	SA	10/04/2005	FD	--	0.371	ND (0.5)	94.6	251	-60	15.3	--	-8.3	10.2	185	171	146	910
MW-25	SA	12/14/2005		3V	0.396	ND (0.5)	75.5	224	-55	14.5	--	-8.4	9.8	143	158	153	838
MW-25	SA	12/14/2005	FD	--	0.382	ND (0.5)	73	219	-50	14.1	--	-8.4	9.71	151	155	156	896
MW-25	SA	03/09/2006		3V	0.39	ND (0.5)	76.4	245	-64.1	15.6	--	-8.4	6.97	210	164	170	910
MW-25	SA	05/03/2006		3V	0.418	ND (0.5)	78	272	-59.4	17.3	--	-9	7.38	222	172	150	907
MW-25	SA	05/03/2006	FD	--	0.431	ND (0.5)	79.7	274	-61	17.8	--	-9	7.53	245	173	155	924
MW-25	SA	10/03/2006		3V	0.466	ND (0.5)	73.3	222	-62.7	15	--	-8.9	7.25	206	158	163	892
MW-25	SA	03/06/2007		3V	0.459	ND (0.5)	72.9	221	-66.9	14.4	--	-9	6.85	203	164	160	843
MW-25	SA	10/02/2007		3V	0.49	ND (1.0)	66	189	-65.8	14	--	-9	7.9	200	155	180	796
MW-25	SA	10/02/2007	FD	--	0.46	ND (1.0)	63	195	-65.7	13	--	-9	7.7	220	157	190	758
MW-25	SA	10/07/2008		3V	0.559	ND (0.5)	59.2	170	-68.5	12.9	--	-9.9	9.89	143	150	200	740
MW-25	SA	10/07/2008	FD	--	0.559	ND (0.5)	58.4	170	-69.1	12.9	--	-10.1	10.2	144	150	210	730

Appendix I

Chemical Performance Monitoring Sampling Results, March 2005 through December 2019

Fourth Quarter 2019 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 Type	Sample Method	Boron, Dissolved (mg/L)	Bromide (mg/L)	Calcium, Dissolved (mg/L)	Chloride (mg/L)	Deuterium (‰)	Magnesium, Dissolved (mg/L)	Nitrate/Nitrite as Nitrogen (mg/L)	Oxygen-18 (‰)	Potassium, Dissolved (mg/L)	Sodium, Dissolved (mg/L)	Sulfate (mg/L)	Total Alkalinity as $CaCO_3$ (mg/L)	Total Dissolved Soilds (mg/L)
MW-25	SA	09/21/2009		3V	0.46	ND (0.5)	64	180	-69.89	12	--	-8.91	7.2	180	130	200	660
MW-25	SA	09/21/2009	FD	--	0.47	ND (0.5)	64	180	-69.45	12	--	-8.87	7.9	190	130	200	650
MW-25	SA	12/07/2010		3V	0.43	ND (1.0)	74	220	-68.9	15	--	-9.4	10	180	120	180	780
MW-25	SA	12/15/2011		3V	0.49	ND (1.0)	89	270	-68.6	19	--	-9.2	8.5	210	120	170	860
MW-25	SA	12/15/2011	FD	--	0.5	ND (0.5)	91	280	-66.7	19	--	-8.9	8.0	220	120	170	890
MW-25	SA	12/11/2012		3V	0.38	ND (0.5)	90	340	-67.6	19	7.25	-9.1	7.9	200	140	160	970
MW-25	SA	12/09/2013		3V	0.43	ND (0.5)	98	310	-68.72	20	6.99	-9.02	8.2	220	140	160	980
MW-25	SA	12/02/2014		LF	0.39	ND (0.5)	100	350	-67.9	19	8.9	-9.21	7.7	210	140	150	970
MW-25	SA	05/11/2015		LF	--	--	--	--	--	--	9.2	--	--	--	--	--	--
MW-25	SA	12/07/2015		LF	0.42	ND (0.5)	110	340	-67.0607	21	10	-8.99177	7.9	230	150	140	1,000
MW-25	SA	04/27/2016		LF	--	--	--	--	--	--	9.7	--	--	--	--	--	--
MW-25	SA	12/08/2016		LF	0.41	ND (0.5)	110 J	380	-65.8821	22	9.3	-8.78942	8.4	220	180	130	1,100
MW-25	SA	05/01/2017		LF	--	--	--	--	--	--	12	--	--	--	--	--	--
MW-25	SA	12/08/2017		LF	0.37	ND (2.5)	120	420	-65.905	24	12	-9.01549	8.8	240	200	130	1,200
MW-25	SA	05/01/2018		LF	--	--	--	--	--	--	12	--	--	--	--	--	--
MW-25	SA	12/10/2018		LF	0.34	ND (2.5)	120	380	-64.42	26	11	-8.75	8.9	230	210	120	1,100
MW-25	SA	12/10/2018	FD	--	0.33	ND (2.5)	120	370	-64.54	25	10	-9.09	8.7	230	210	120	1,100
MW-25	SA	05/15/2019		LF	--	--	--	--	--	--	12	--	--	--	--	--	--
MW-25	SA	12/09/2019		LF	0.37 J	ND (2.5)	120	400	-65.1	27	11	-8.65	8.2	220	210	130	1,300
MW-25	SA	12/09/2019	FD	--	0.39 J	ND (2.5)	130	390	-65.08	29	11	-8.62	8.8	240	210	120	1,200
MW-26	SA	03/08/2005		3V	0.557	ND (0.5)	166	756	-70	41.6	--	-8.8	10.7	439	370	98.7	1,840
MW-26	SA	03/08/2005	FD	--	0.559	ND (0.5)	166	708	-70	40.9	--	-8.7	11.4	438	338	96.1	1,800
MW-26	SA	06/13/2005		3V	0.663	ND (0.5)	178	847	-65	44.6	--	-8.2	14	511	371	103	2,130
MW-26	SA	10/04/2005		3V	0.526	0.601	166	779	-68	40.4	--	-7.8	19.8	352	372	109	2,120
MW-26	SA	12/12/2005		3V	0.613	0.546	162	788	-55	39.9	--	-8.5	20.3	349	372	99.7	2,610
MW-26	SA	03/08/2006		3V	0.621	ND (0.5)	155	772	-60.4	38.1	--	-8.6	11.7	434 J	324	121	2,070
MW-26	SA	05/01/2006		3V	0.723	ND (0.5)	165	927	-62.7	42	--	-8.9	12.8	555	382	121	2,130
MW-26	SA	10/03/2006		3V	0.692	ND (2.5)	170	894	-63	43.9	--	-8.8	12.8	510	370	105	2,220
MW-26	SA	03/12/2007		3V	0.622	0.646	163	917	-67	41.6	--	-9	12.9	621	387	90	2,280
MW-26	SA	10/02/2007		3V	0.66	ND (1.0)	170	945	-66.3	42	--	-8.6	15	620	391	100	2,180
MW-26	SA	03/12/2008		3V	0.589	ND (1.0)	176	908	-67.2	44.1 J	--	-8.1	16.2 J	498	398	103	2,500
MW-26	SA	03/12/2008	FD	--	0.601	ND (1.0)	160	905	-68.2	32.8 J	--	-8.9	12.7 J	462	398	102	2,420
MW-26	SA	10/08/2008		3V	0.591	ND (1.0)	183	930	-66.5	45.8	--	-8.7	14.6	555	440	110	2,400
MW-26	SA	03/10/2009		3V	0.604	1.4	172	870	-65.3	47.9	--	-8.41	14.8	585	440 J	100	2,300
MW-26	SA	03/10/2009	FD	--	0.65	1.5	174	860	-65.76	46.2	--	-8.68	15.6	631	440 J	100	2,300
MW-26	SA	09/22/2009		3V	0.59	ND (1.0)	170	870	-68.25	39	--	-9.04	14	550	450	100	2,200
MW-26	SA	12/15/2010		3V	--	--	180	900	--	40	--	--	--	560	480	100	--
MW-26	SA	12/09/2011		3V	0.89	1.2	210	930	-65.2	47	--	-8.1	15	690	530	94	2,300
MW-26	SA	10/04/2012		3V	--	--	178	920	--	46.2	--	--	--	637	520	--	--
MW-26	SA	10/04/2012		H	--	--	162	930	--	42.3	--	--	--	661	530	--	--
MW-26	SA	10/04/2012		LF	--	--	165	960	--	43.7	--	--	--	702	550	--	--
MW-26	SA	11/27/2012		3V	--	--	168	930	--	45	15.6	--	--	564	520	100	--
MW-26	SA	11/27/2012		H	--	--	152	840	--	39.1	14.7	--	--	575	480	100	--
MW-26	SA	11/27/2012		LF	--	--	157	960	--	41.7	18.1	--	--	671	570	110	--
MW-26	SA	03/12/2013		3V	--	--	186	930	--	48.7	9.51	--	--	662	530	100	--
MW-26	SA	03/12/2013		H	--	--	181	950	--	48.4	19.5	--	--	705	550	100	--
MW-26	SA	03/12/2013		MPP	--	--	174	950	--	46.8	19.2	--	--	683	560	100	--
MW-26	SA	05/07/2013		3V	--	--	--	--	--	--	17.7 J	--	--	--	--	--	--
MW-26	SA	12/04/2013		3V	0.93	1.0	160	890	-64.08	41	18	-8.41	12	670	520	110	2,600
MW-26	SA	05/05/2014		3V	--	--	--	--	--	--	20.4	--	--	--	--	--	--
MW-26	SA	12/15/2014		LF	0.79	1.1	150	910	-67.3	33	21	-8.33	--	470	530	110	2,700
MW-26	SA	12/15/2014	FD	--	0.82	1.0	150	910	-66.9	34	22	-8.31	--	450	530	110	2,700
MW-26	SA	05/19/2015		LF	--	--	--	--	--	--	23	--	--	--	--	--	--

Appendix I

Chemical Performance Monitoring Sampling Results, March 2005 through December 2019

Fourth Quarter 2019 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 Type	Sample Method	Boron, Dissolved (mg/L)	Bromide (mg/L)	Calcium, Dissolved (mg/L)	Chloride (mg/L)	Deuterium (‰)	Magnesium, Dissolved (mg/L)	Nitrate/Nitrite as Nitrogen (mg/L)	Oxygen-18 (‰)	Potassium, Dissolved (mg/L)	Sodium, Dissolved (mg/L)	Sulfate (mg/L)	Total Alkalinity as $CaCO_3$ (mg/L)	Total Dissolved Soilds (mg/L)
MW-26	SA	12/08/2015		LF	0.86	ND (1.0)	140	890	-65.4939	32	20	-8.19913	13	640	500	110	2,400
MW-26	SA	12/08/2015	FD	--	0.81	ND (1.0)	140	870	-65.0305	30	20	-7.93156	14	640	520	110	2,500
MW-26	SA	04/28/2016		LF	--	--	--	--	--	--	21	--	--	--	--	--	--
MW-26	SA	12/08/2016		LF	1.1	ND (2.5)	160 J	890	-65.4433	41	22	-7.9186	13	650	520	120	2,400
MW-26	SA	12/08/2016	FD	--	1.1	ND (2.5)	160 J	880	-65.5157	42	21	-7.98162	13	680	520	120	2,500
MW-26	SA	04/26/2017		LF	--	--	--	--	--	--	23	--	--	--	--	--	--
MW-26	SA	12/11/2017		LF	1.0	ND (2.5)	160	910	-64.5812	37	21	-8.11508	12	620	500	120	2,300
MW-26	SA	12/11/2017	FD	--	0.99	ND (2.5)	150	900	-64.4695	36	20	-8.44161	12	600	510	120	2,300
MW-26	SA	05/01/2018		LF	--	--	--	--	--	--	20	--	--	--	--	--	--
MW-26	SA	12/07/2018		LF	1.0	ND (2.5)	150	820	-64.04	35	16	-8.21	13	630	490	120	2,300
MW-26	SA	05/22/2019		LF	--	--	--	--	--	--	21	--	--	--	--	--	--
MW-26	SA	12/12/2019		LF	1.1	ND (2.5)	160	790	-62.55	42	19	-8.51	12 J	560	470	130	2,300
MW-26	SA	12/12/2019	FD	--	1.1	ND (2.5)	150	800	-62.71	40	19	-8.57	9.3 J	440	470	130	2,300
MW-31-060	SA	03/09/2005		3V	0.401	ND (0.5)	108	649	-63	17.3	--	-8.6	5.97	424	210	76.6	1,540
MW-31-060	SA	06/13/2005		3V	0.388	ND (0.5)	121	745	-65	18.9	--	-8.2	6.57	403	207	70	1,660
MW-31-060	SA	10/06/2005		3V	0.462	ND (0.5)	109	691	-65	16.5	--	-8.6	9.75	308	206	77.3	1,660
MW-31-060	SA	12/13/2005		3V	0.359	ND (0.5)	87	669	-54	15.4	--	-8.7	9.32	275	199	73	1,620
MW-31-060	SA	03/15/2006		3V	0.393	ND (0.5)	106	661	-65.6	17.5	--	-8.6	7.3	403	191	89.3	1,560 J
MW-31-060	SA	03/15/2006	FD	--	0.383	ND (0.5)	101	662	-64.9	16.8	--	-8.6	6.94	391	192	81.9	1,640 J
MW-31-060	SA	05/01/2006		3V	0.449	ND (0.5)	118	691	-63.2	20.1	--	-9.6	7.78	467	209	79.6	1,630
MW-31-060	SA	10/05/2006		3V	0.464	ND (0.5)	113	687	-66.3	20.6	--	-9.4	9.6 J	325	205	80	1,620
MW-31-060	SA	03/12/2007		3V	0.402 J	ND (0.5)	116	757	-69	20.3	--	-9.3	6.05	454	222	72.5	1,750
MW-31-060	SA	10/04/2007		3V	0.64	ND (1.0)	150	799	-69.6	26	--	-9.4	7.3	580	208	80	1,720
MW-31-060	SA	10/06/2008		3V	0.399	ND (1.0)	150	810	-72.2	26	--	-10.2	9.39	460	240	81	2,000
MW-31-060	SA	09/21/2009		3V	0.43	ND (1.0)	160	870	-72.11	26	--	-9.23	9.6	480	220	75	1,800
MW-31-060	SA	12/15/2010		3V	0.43	ND (0.5)	170	840	-69.3	27	--	-9	12	440	210	78	2,000
MW-31-060	SA	12/06/2011		3V	0.54	ND (1.0)	150	790	-67.9	24	--	-8.8	7.6	450	200	76	1,800
MW-31-060	SA	11/13/2012		3V	0.44	ND (0.5)	150	890	-71.8	24	3.3	-9.2	7.1	470	200	78	1,900
MW-31-060	SA	12/03/2013		3V	0.48	ND (0.5)	140	870	-66.39	24	3.53	-8.56	6.4	520	220	78	1,900
MW-31-060	SA	12/03/2014		LF	0.4	ND (0.5)	120	790	-68.5	19	3.9	-8.83	5.2	430	210	140	1,700
MW-31-060	SA	12/07/2015		LF	0.5	ND (0.5)	100	620	-64.5767	17	4.7	-8.2946	5.4	470	200	92	1,600
MW-31-060	SA	04/27/2016		LF	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-31-060	SA	12/09/2016		LF	0.42	ND (0.5)	120 J	750	-66.636	20 J	4.1	-8.48888	6.2	470	210	91	1,700
MW-31-060	SA	12/09/2016	FD	--	0.42	ND (1.0)	120 J	760	-66.0943	22 J	4.1	-8.65932	6.6	470	220	93	1,700
MW-31-060	SA	04/27/2017		LF	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-31-060	SA	12/12/2017		LF	0.79	ND (2.5)	130	840	-66.2365	22	3.4	-8.89909	6.1	490	210	86	1,800
MW-31-060	SA	04/27/2018		LF	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-31-060	SA	12/10/2018		LF	0.49	ND (2.5)	150	910	-65.9	26	3.3	-8.82	7.2	560	220	89	1,900
MW-31-060	SA	05/20/2019		LF	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-31-060	SA	12/12/2019		LF	0.51	ND (2.5)	150	880	-66.19	24	3.5	-8.66	7.2	470	220	90	1,900
MW-31-060	SA	12/12/2019	FD	--	ND (0.5)	ND (2.5)	120	870	-66.28	23	3.3	-8.65	7.0	470	220	89	1,900
MW-32-035	SA	03/09/2005		3V	1.07	0.845	312	1,770	-68	85.5	--	-8.2	13	944	465	260	3,560
MW-32-035	SA	06/17/2005		3V	1.18	ND (2.5)	506	3,520	-72	120	--	-9.5	14.8	2,110	787	223	7,550
MW-32-035	SA	10/04/2005		3V	1.26	ND (5.0)	567	3,840	-70	134	--	-8.3	29.3	1,530	765	208	8,340
MW-32-035	SA	12/16/2005		3V	1.25	1.02	606	3,510	-63	128	--	-8.8	30	1,580	710	219	7,660
MW-32-035	SA	03/10/2006		3V	1.13	ND (0.5)	654	4,210	-74	129	--	-8.6	19.2	2,360	1,010	234	9,230
MW-32-035	SA	05/04/2006		3V	1.38	ND (0.5)	693	4,960	-67.8	148	--	-9.1	19.5	2,800	1,130	218	9,840
MW-32-035	SA	10/02/2006		3V	1.48	ND (2.5)	839	5,430	-71.4	165	--	-9.4	23.9	3,260	1,050	290	11,200
MW-32-035	SA	12/11/2006		3V	1.43	1.9	845	5,090	-70.4	173	--	-9	22.5	2,620	1,000	338	10,400
MW-32-035	SA	03/06/2007		3V	1.35	2.65	1,080	6,070	-75.4	209	--	-10.2	23.5	2,910	1,200	360	12,600
MW-32-035	SA	04/30/2007		3V	1.35	2.6	1,250	6,610	-78.7	273	--	-9.9	26.2	3,280	1,280	475	12,100
MW-32-035	SA	10/01/2007		3V	1.7	2.62	1,000	6,830	-72.7	390	--	-8.9	29	4,000	1,120	490	13,700
MW-32-035	SA	10/03/2008		3V	1.49	3.1	829	7,600	-73.1	150	--	-9.8	52.3	3,490	1,300	550	15,000

Appendix I

Chemical Performance Monitoring Sampling Results, March 2005 through December 2019

Fourth Quarter 2019 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 Type	Sample Method	Boron, Dissolved (mg/L)	Bromide (mg/L)	Calcium, Dissolved (mg/L)	Chloride (mg/L)	Deuterium (‰)	Magnesium, Dissolved (mg/L)	Nitrate/Nitrite as Nitrogen (mg/L)	Oxygen-18 (‰)	Potassium, Dissolved (mg/L)	Sodium, Dissolved (mg/L)	Sulfate (mg/L)	Total Alkalinity as $CaCO_3$ (mg/L)	Total Dissolved Soilds (mg/L)
MW-32-035	SA	09/22/2009		3V	1.7	2.8	880	6,900	-75.2	400	--	-9.32	53	3,100	1,400	530	13,000
MW-32-035	SA	12/09/2010		3V	1.7 J	ND (2.5)	750	5,500	-84.2	390 J	--	-10.2	51 J	3,000	1,600	590	11,000
MW-32-035	SA	12/09/2011		3V	1.7	ND (2.5)	680	5,000	-84.2	310	--	-10.8	34	3,100	1,700	640	8,500
MW-32-035	SA	12/05/2012		3V	1.3	ND (5.0)	460	4,300	-89	240	0.0274	-11	31	2,700	1,700	630	10,000
MW-32-035	SA	11/06/2013		3V	1.2	ND (2.5)	450	3,500	-87.16	210	0.0482	-10.97	23	2,500	1,600	580	8,300
MW-32-035	SA	11/11/2014		LF	1.1	ND (0.5)	450	3,100	-87.84	170	--	-10.39	18	2,000	1,500	550	5,800
MW-32-035	SA	12/01/2014		LF	--	--	--	--	--	--	0.093	--	--	--	--	--	--
MW-32-035	SA	04/20/2015		LF	--	--	--	--	--	--	2.3	--	--	--	--	--	--
MW-32-035	SA	12/03/2015		LF	1.2	ND (2.5)	450	2,800	-87.49	220	0.058	-11.18	18	1,900	1,200	610	7,400
MW-32-035	SA	04/25/2016		LF	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-32-035	SA	12/06/2016		LF	0.99	ND (2.5)	370	2,800	-87.0352	210	ND (0.05)	-10.7781	20	1,800	1,100	630	6,700
MW-32-035	SA	04/27/2017		LF	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-32-035	SA	12/04/2017		LF	1.0	ND (2.5)	360	2,500	-88.18	160	ND (0.05)	-11.43	15	1,600	1,100	700	5,500
MW-32-035	SA	04/23/2018		LF	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-32-035	SA	12/04/2018		LF	0.91	ND (2.5)	400	2,200	-88.68	170	ND (0.1)	-10.99	16	1,500	960	570	5,500
MW-32-035	SA	04/23/2019		LF	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-32-035	SA	12/09/2019		LF	1.0 J	ND (5.0)	380	2,500	-87.84	270	0.051	-11.01	16	1,400	740	740	5,700
MW-34-055	MA	03/10/2005		3V	1.19	0.654	366	2,620	-82	71.3	--	-10.8	29.1	1,900	739	240	6,230
MW-34-055	MA	07/15/2005		3V	1.02	ND (0.5)	247	2,250	-84	52	--	-10.3	16.5	1,420	607	242	--
MW-34-055	MA	10/05/2005		3V	1.2	ND (0.5)	272	2,170	-88	59.1	--	-10.6	25.8	1,230	619	232	5,150
MW-34-055	MA	12/14/2005		3V	0.937	0.588	217	2,150	-74	45	--	-10.8	27.2	965	552	236	5,100
MW-34-055	MA	03/08/2006		3V	0.956	ND (0.5)	256	2,080	-86.8	54.2	--	-10.8	13.5	1,640	593	272	4,850
MW-34-055	MA	05/03/2006		3V	0.846	ND (0.5)	198	2,070	-84.3	44.8	--	-11.5	11.1	1,360	500	302	4,320
MW-34-055	MA	10/04/2006		3V	0.54	ND (0.5)	37.6	443	-94.8	8.08	--	-12.2	4.59	536	230	368	1,680 J
MW-34-055	MA	10/03/2007		3V	0.26	ND (1.0)	15	109	-96.6	3.3	--	-11.3	3.3	290	266	190	730
MW-34-055	MA	10/07/2008		3V	0.248	--	72.4	100	-100	16.9	--	-13	5.26	192	250	170	700
MW-34-055	MA	09/30/2009		3V	0.15	--	77	--	-100.79	17	--	-12.26	4.4	120	--	160	700
MW-34-055	MA	11/17/2009		3V	--	ND (0.5)	--	93	--	--	--	--	--	--	240	--	--
MW-34-055	MA	12/07/2010		3V	0.1	ND (0.5)	81	87	-98.8	19	--	-12.1	5.1	100	230	140	590
MW-34-055	MA	12/06/2011		3V	0.19	ND (0.5)	81	83	-100.5	19	--	-12.3	4.6	100	220	160	630
MW-34-055	MA	12/12/2012		3V	0.15	ND (0.5)	75	78	-105	20	ND (0.01)	-12.7	3.7	100	210	140	630
MW-34-055	MA	11/20/2013		3V	0.13	ND (0.5)	69	72	-103.32	19	ND (0.01)	-13.09	4.3	88	210	150	600
MW-34-055	MA	11/06/2014		LF	ND (0.1)	ND (0.5)	72	76	-101.86	20	ND (0.05)	-12.43	4.0	85	200	140	640
MW-34-055	MA	12/03/2015		LF	0.19	ND (0.5)	80	83	-102.02	25	ND (0.05)	-13.02	4.7	86	230	150	630
MW-34-055	MA	12/06/2016		LF	0.11	ND (0.5)	77 J	89	-101.069	26	ND (0.05)	-12.4446	5.6	100	230	150	680
MW-34-055	MA	12/06/2017		LF	ND (0.5)	ND (0.5)	85	100	-99.07	27	ND (0.05)	-11.89	4.9	91	230	160	640
MW-34-055	MA	12/05/2018		LF	ND (0.12)	ND (0.5)	74	88	-98.79	24	ND (0.1)	-12.29	5.1	99	230	150	670
MW-34-055	MA	12/05/2018	FD	--	ND (0.11)	ND (0.5)	73	87	-98.78	23	ND (0.1)	-12.29	5.1	98	230	150	660
MW-34-055	MA	12/10/2019		LF	ND (0.2)	ND (1.0)	77	84	-98.06	27	ND (0.05)	-12.28	4.9 J	92	220	160	640
MW-34-055	MA	12/10/2019	FD	--	ND (0.17)	ND (1.0)	71	83	-98.49	22	ND (0.05)	-12.26	4.7 J	90	210	150	630
MW-34-080	DA	03/08/2005		3V	1.65	1.01	439	4,180	-83	68.1	--	-10.4	28	2,750	1,040	304	6,940
MW-34-080	DA	03/15/2005		3V	--	--	445	3,920	--	65.7	--	--	29.7	2,990	ND (5.0)	288	8,980
MW-34-080	DA	06/30/2005		3V	1.66	ND (0.5)	497	3,910	-82	76.5	--	-8.4	27.7	2,670	979	302	7,840
MW-34-080	DA	10/05/2005		3V	1.57	ND (0.5)	429	3,880	-85	72.5	--	-10.1	47.4	1,660	1,060	302	10,200
MW-34-080	DA	12/14/2005		3V	1.54	0.854	432	3,700	-71	68.3	--	-10.2	54.9	1,710	880	297	8,800
MW-34-080	DA	03/09/2006		3V	1.49	ND (0.5)	383	3,520	-86.8	65.8	--	-9.9	24	2,420	986	313	7,830
MW-34-080	DA	05/03/2006		3V	1.38	ND (0.5)	425	3,700	-77.6	70.3	--	-11.7	23.9	2,480	921	297	7,950
MW-34-080	DA	10/04/2006		3V	1.31	0.737	341	3,210	-81.8	65.4	--	-11.3	21.1	2,170	786	268	7,080
MW-34-080	DA	12/12/2006		3V	1.26	0.742	298	3,190	-80.9	62.9	--	-10.5	18.9	2,040	789	288	6,510
MW-34-080	DA	03/05/2007		3V	1.29	0.72	315	3,300	-85.8	68.3	--	-11.5	19.4	2,020	783	205	6,360 J
MW-34-080	DA	04/30/2007		3V	1.33	ND (1.0)	282	3,320 J	-88.9	57	--	-11.5	18.6	2,080	889 J	245	6,390
MW-34-080	DA	10/03/2007		3V	1.2	ND (1.0)	220	2,630	-87.8	53	--	-11.3	21	2,000	696	240	5,490
MW-34-080	DA	12/13/2007		3V	1.09	ND (1.0)	193	2,380	-88.6	49.1	--	-10.9	25.4	1,450	698	264	5,420

Appendix I

Chemical Performance Monitoring Sampling Results, March 2005 through December 2019

Fourth Quarter 2019 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 Type	Sample Method	Boron, Dissolved (mg/L)	Bromide (mg/L)	Calcium, Dissolved (mg/L)	Chloride (mg/L)	Deuterium (‰)	Magnesium, Dissolved (mg/L)	Nitrate/Nitrite as Nitrogen (mg/L)	Oxygen-18 (‰)	Potassium, Dissolved (mg/L)	Sodium, Dissolved (mg/L)	Sulfate (mg/L)	Total Alkalinity as $CaCO_3$ (mg/L)	Total Dissolved Soilds (mg/L)
MW-34-080	DA	03/12/2008		3V	1.14	ND (1.0)	237	2,510	-87.3	52.6	--	-11.4	19.2	2,030	739	238	5,500
MW-34-080	DA	05/06/2008		3V	1.2	0.525	230	2,460	-87.3	49	--	-11.4	30	1,600	753	216	5,820
MW-34-080	DA	10/07/2008		3V	0.765	ND (2.0)	223	2,400	-87.6	46.3	--	-11.8	22	1,220	720	250	5,300
MW-34-080	DA	12/10/2008		3V	1.11	ND (1.0)	147	2,190	-93.1	45.2	--	-10.97	20.6	3,880	698	253	5,300
MW-34-080	DA	03/10/2009		3V	1.08	ND (2.5)	219	2,300	-84.77	46.3	--	-10.85	22.2	1,480	700 J	240	5,100
MW-34-080	DA	04/30/2009		3V	1.11	ND (1.0)	219	2,340	-85.79	50	--	-11.45	24.6	1,510	768	237	5,830
MW-34-080	DA	09/30/2009		3V	0.98	ND (1.0)	240	2,300	-88.93	46	--	-10.79	22	1,500	710	230	4,000
MW-34-080	DA	12/09/2009		3V	--	ND (1.0)	--	2,200	-89.1	--	--	-11.88	--	--	690	230	4,580
MW-34-080	DA	03/10/2010		3V	0.93	ND (1.0)	220 J	2,100	-91.56	41	--	-12.13	28	1,400 J	660	240	4,900
MW-34-080	DA	12/07/2010		3V	1.0	ND (1.0)	240	2,300	-87.3	47	--	-11.1	24	1,300	700	220	4,600
MW-34-080	DA	12/06/2011		3V	1.1	ND (1.0)	220	1,900	-88.1	43	--	-11.1	16	1,300	640	230	3,900
MW-34-080	DA	12/12/2012		3V	1.0	ND (1.0)	220	1,800	-90.2	51	ND (0.01)	-11.2	17	1,300	630	250	4,300
MW-34-080	DA	12/12/2012	FD	--	--	--	210	1,800	-89.3	48	ND (0.01)	-11.1	--	1,300	630	250	--
MW-34-080	DA	11/20/2013		3V	0.96	ND (1.0)	210	1,900	-87.99	52	ND (0.01)	-11.43	14	1,300	620	260	4,500
MW-34-080	DA	11/20/2013	FD	--	1.0	ND (1.0)	210	1,900	-88.36	56	ND (0.01)	-11.18	14	1,200	620	260	4,600
MW-34-080	DA	11/06/2014		LF	0.84	--	240	--	-90.9	50	--	-11.6	12	1,200	--	280 J	--
MW-34-080	DA	12/01/2014		LF	--	--	--	--	--	--	ND (0.05)	--	--	--	--	--	--
MW-34-080	DA	04/20/2015		LF	--	--	--	--	--	--	ND (0.05)	--	--	--	--	--	--
MW-34-080	DA	12/03/2015		LF	0.83	ND (2.5)	220	1,500	-92.07	48	ND (0.05)	-11.53	--	1,000	510	300	3,600
MW-34-080	DA	04/26/2016		LF	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-34-080	DA	12/06/2016		LF	0.98	ND (2.5)	220 J	2,000	-88.5807	47	--	-11.3322	15	1,300	630	270	4,300
MW-34-080	DA	12/06/2016	FD	--	0.98	ND (2.5)	230 J	1,900	-88.0238	47	--	-10.9343	16	1,300	620	290	4,200
MW-34-080	DA	04/27/2017		LF	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-34-080	DA	12/06/2017		LF	0.89	ND (2.5)	220	2,400	-85.89	71	ND (0.05)	-10.82	14	1,400	670	280	4,700
MW-34-080	DA	04/24/2018		LF	--	--	--	--	--	--	ND (0.05)	--	--	--	--	--	--
MW-34-080	DA	12/05/2018		LF	1.0	ND (2.5)	280	2,300	-84.72	82	ND (0.1)	-11.14	17	1,600	640	280	4,900
MW-34-080	DA	04/24/2019		LF	--	--	--	--	--	--	ND (0.05)	--	--	--	--	--	--
MW-34-080	DA	12/10/2019		LF	1.2 J	ND (2.5)	290	2,400	-84.77	100	ND (0.05)	-11.14	17 J	1,500	610	290	5,300
MW-34-080	DA	12/10/2019	FD	--	1.2 J	ND (2.5)	290	2,300	-84.25	100	ND (0.05)	-10.75	18 J	1,600	610	290	5,300
MW-34-100	DA	03/14/2005		3V	--	--	221	5,010	--	17.4	--	--	34.1	3,600	1,210	175	10,800
MW-34-100	DA	06/21/2005		3V	2.22	ND (0.5)	229	5,350	-75	17.4	--	-9.7	27.1	3,510	1,270	179	11,300
MW-34-100	DA	06/21/2005	FD	--	2.36	ND (0.5)	243	4,920	-77	18.2	--	-9.5	32.1	3,740	1,180	179	10,900 J
MW-34-100	DA	10/05/2005		3V	2.57	ND (0.5)	171	4,530	-83	13.8	--	-9.9	55.2	2,450	1,150	172	10,400
MW-34-100	DA	10/05/2005	FD	--	2.57	ND (0.5)	228	4,680	-83	14.1	--	-9.9	50.9	2,730	1,200	172	10,400
MW-34-100	DA	12/14/2005		3V	2.32	--	226	--	--	14.9	--	--	62.9	2,530	--	--	--
MW-34-100	DA	12/14/2005	FD	--	2.4	--	220	--	--	15.1	--	--	64.2	2,530	--	--	--
MW-34-100	DA	03/08/2006		3V	2.41	--	179	4,720	-75.5J	12.1	--	-11.4	32.5	3,580	1,180	152	10,000
MW-34-100	DA	03/08/2006	FD	--	2.46	--	182	4,920	-101.9J	11.9	--	-10.1	36.5	3,530	1,220	159	10,100
MW-34-100	DA	05/03/2006		3V	2.73	--	162	5,060	-74.5	12	--	-10.5	31.1	3,890	1,200	133	9,940

Appendix I

Chemical Performance Monitoring Sampling Results, March 2005 through December 2019

Fourth Quarter 2019 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 Type	Sample Method	Boron, Dissolved (mg/L)	Bromide (mg/L)	Calcium, Dissolved (mg/L)	Chloride (mg/L)	Deuterium (‰)	Magnesium, Dissolved (mg/L)	Nitrate/Nitrite as Nitrogen (mg/L)	Oxygen-18 (‰)	Potassium, Dissolved (mg/L)	Sodium, Dissolved (mg/L)	Sulfate (mg/L)	Total Alkalinity as $CaCO_3$ (mg/L)	Total Dissolved Soilds (mg/L)
MW-34-100	DA	05/03/2006	FD	--	2.77	--	166	5,170	-71.9	12.2	--	-10.6	31.3	3,900	1,230	136	9,990
MW-34-100	DA	04/30/2007		3V	2.39	--	186	5,920	-80.7	12	--	-10.9	31.5	3,840	1,040	123	10,600
MW-34-100	DA	04/30/2007	FD	--	2.4	--	189	5,880	-82.1	12	--	-11.2	32.1	3,920	1,050	123	11,900
MW-34-100	DA	10/03/2007		3V	2.5	ND (1.0)	170	5,350	-78.2	11	--	-10.2	44	4,300	970	120	10,700
MW-34-100	DA	10/03/2007	FD	--	2.4	ND (1.0)	160	5,360	-78.4	10	--	-10.6	43	4,300	953	120	10,500
MW-34-100	DA	10/07/2008		3V	2.35	ND (2.5)	158	5,400	-80.8	10.6	--	-10.9	54.5	2,970 J	1,200	140	11,000
MW-34-100	DA	10/07/2008	FD	--	2.59	ND (2.5)	184	5,600	-81.3	11.5	--	-11	56.7	3,880 J	1,200	140	11,000
MW-34-100	DA	09/30/2009		3V	2.3	--	200	5,500	--	11	--	--	73	3,800	1,300	170	--
MW-34-100	DA	09/30/2009	FD	--	--	--	--	5,600	--	--	--	--	--	--	1,300	170	--
MW-34-100	DA	11/17/2009		3V	--	ND (1.0)	--	--	-82.38	--	--	-10.47	--	--	--	--	11,000
MW-34-100	DA	12/08/2010		3V	2.6	ND (2.5)	190	5,800	-79.5	9.6	--	-9.8	52 J	4,100	1,300	140 J	10,000
MW-34-100	DA	12/08/2010	FD	--	2.5	ND (1.0)	180	5,700	-80.4	9.8	--	-10	60 J	4,000	1,200	89 J	9,900
MW-34-100	DA	12/06/2011		3V	2.7	ND (2.5)	170	5,700	-79.2	7.6	--	-10.1	43	4,000	1,300	120	10,000
MW-34-100	DA	12/06/2011	FD	--	2.7	ND (2.5)	160	5,600	-79.5	7.4	--	-10	43 J	3,900	1,200	120	9,400
MW-34-100	DA	11/26/2012		3V	2.6	ND (2.5)	150	5,900	-80.5	8.6	0.444	-10.1	47	3,100	1,200	120	11,000
MW-34-100	DA	11/26/2012	FD	--	2.6	ND (2.5)	150	5,900	-80.9	8.2	0.421	-10.2	47	3,200	1,200	130	11,000
MW-34-100	DA	04/16/2013		3V	--	--	--	--	--	--	ND (0.5)	--	--	--	--	--	--
MW-34-100	DA	04/16/2013	FD	--	--	--	--	--	--	--	ND (0.5)	--	--	--	--	--	--
MW-34-100	DA	11/20/2013		3V	2.6	ND (2.5)	140	5,300	-78.9	8.0	0.422	-10.18	35	3,900	1,200	120	10,000
MW-34-100	DA	11/20/2013	FD	--	2.7	ND (2.5)	150	5,300	-79.33	8.5	0.419	-9.81	35	3,900	1,100	120	10,000
MW-34-100	DA	10/02/2014		LF	--	--	--	--	--	--	0.64	--	--	--	--	--	--
MW-34-100	DA	12/01/2014		LF	2.2	ND (1.0)	140	5,400	-76.95	5.6	0.58 J	-9.97	30	3,900	1,100	95	9,900
MW-34-100	DA	12/01/2014	FD	--	2.0	ND (1.0)	140	5,500	-77.2	5.6	0.61 J	-10.1	32	4,000	1,100	100	9,900
MW-34-100	DA	02/16/2015		LF	--	--	--	--	--	--	0.61	--	--	--	--	--	--
MW-34-100	DA	04/20/2015		LF	--	--	--	--	--	--	ND (0.05)	--	--	--	--	--	--
MW-34-100	DA	04/20/2015	FD	--	--	--	--	--	--	--	ND (0.056)	--	--	--	--	--	--
MW-34-100	DA	10/06/2015		LF	--	--	--	--	--	--	0.29	--	--	--	--	--	--
MW-34-100	DA	12/03/2015		LF	2.7	ND (5.0)	150	5,100	-79.04	6.7	0.74	-10.1	30	3,700	980	100	9,900
MW-34-100	DA	12/03/2015	FD	--	2.8	ND (5.0)	160	5,200	-78.93	7.1	0.73	-10.16	31	3,800	1,000	94	9,600
MW-34-100	DA	02/25/2016		LF	--	--	--	--	--	--	0.13	--	--	--	--	--	--
MW-34-100	DA	04/26/2016		LF	--	--	--	--	--	--	ND (0.05)	--	--	--	--	--	--
MW-34-100	DA	10/06/2016		LF	--	--	--	--	--	--	ND (0.05)	--	--	--	--	--	--
MW-34-100	DA	12/06/2016		LF	2.3	0.59	140 J	4,700	-81.5735	7.6	0.078	-10.6026	33	3,600	1,200	130	8,900
MW-34-100	DA	02/06/2017		LF	--	--	--	--	--	--	0.19	--	--	--	--	--	--
MW-34-100	DA	02/06/2017	FD	--	--	--	--	--	--	--	0.18	--	--	--	--	--	--
MW-34-100	DA	04/27/2017		LF	--	--	--	--	--	--	ND (0.05)	--	--	--	--	--	--
MW-34-100	DA	10/02/2017		LF	--	--	--	--	-84.83	--	ND (0.05)	-10.55	--	--	--	--	--
MW-34-100	DA	12/06/2017		LF	1.7	ND (2.5)	140	3,500	--	21	ND (0.05)	--	24	2,300	1,000	170	6,800
MW-34-100	DA	02/20/2018		LF	--	--	--	--	--	--	ND (0.05)	--	--	--	--	--	--
MW-34-100	DA	04/24/2018		LF	--	--	--	--	--	--	ND (0.05)	--	--	--	--	--	--
MW-34-100	DA	04/24/2018	FD	--	--	--	--	--	--	--	ND (0.05)	--	--	--	--	--	--
MW-34-100	DA	10/01/2018		LF	--	--	--	--	--	--	3.6	--	--	--	--	--	--
MW-34-100	DA	12/05/2018		LF	1.7	ND (1.0)	170	3,100	-86.28	27	ND (0.1)	-11.24	24	2,400	950	180	6,100
MW-34-100	DA	02/14/2019		LF	--	--	--	--	--	--	ND (0.05)	--	--	--	--	--	--
MW-34-100	DA	04/24/2019		LF	--	--	--	--	--	--	ND (0.05)	--	--	--	--	--	--
MW-34-100	DA	10/01/2019		LF	--	--	--	--	--	--	ND (0.05)	--	--	--	--	--	--
MW-34-100	DA	12/10/2019		LF	2.3 J	ND (1.0)	180	4,000	-84	26	ND (0.05)	-11.06	31 J	3,100	1,100	150	9,200
MW-34-100	DA	12/10/2019	FD	--	2.4 J	ND (1.0)	180	4,000	-83.92	26	ND (0.05)	-10.83	30 J	2,900	1,100	160	9,100
R-28	--	03/08/2005		G	ND (0.2)	ND (0.5)	83.7	90.4	-102	31.4	--	-12.5	5.02	107	231	132	651
R-28	--	06/14/2005		G	ND (0.2)	ND (0.5)	78.5	91.2	-95	28.5	--	-11.6	5.08	94.5	268	127	680
R-28	--	10/05/2005		G	ND (0.2)	ND (0.5)	85.7	85.5	-94	30.4	--	-11.6	6.3	77	255	122	672

Appendix I

Chemical Performance Monitoring Sampling Results, March 2005 through December 2019

Fourth Quarter 2019 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 Type	Sample Method	Boron, Dissolved (mg/L)	Bromide (mg/L)	Calcium, Dissolved (mg/L)	Chloride (mg/L)	Deuterium (‰)	Magnesium, Dissolved (mg/L)	Nitrate/Nitrite as Nitrogen (mg/L)	Oxygen-18 (‰)	Potassium, Dissolved (mg/L)	Sodium, Dissolved (mg/L)	Sulfate (mg/L)	Total Alkalinity as $CaCO_3$ (mg/L)	Total Dissolved Soilds (mg/L)
R-28	--	12/16/2005		G	ND (0.2)	ND (0.5)	87.2	88.1	-83	29.8	--	-11.5	6.11	76.8	254	126	710
R-28	--	03/06/2006		G	ND (0.2)	ND (0.5)	76.6	91	-93.4	26.6	--	-12.3	5.22 J	91.5	270	146	675
R-28	--	05/03/2006		G	ND (0.2)	ND (0.5)	88.1	93.4	-92.1	31.4	--	-13	4.04 J	107	270	136	586
R-28	--	10/04/2006		G	ND (0.2)	ND (0.5)	84.2	90.9	-95.3	32.1	--	-12.6	6.17 J	96.5	259	133	644 J
R-28	--	12/20/2006		G	ND (0.2)	ND (0.5)	85.7	93.3	-99.6	32	--	-12.4	4.66	108	262	143	615
R-28	--	03/14/2007		G	ND (0.2)	ND (0.5)	87.9	96.7	-100.4	31	--	-12.8	5.71	105	268	133	710
R-28	--	05/09/2007		G	ND (0.2)	ND (0.5)	86.1	95.8	-102.3	30.5	--	-13	5.92	103	271	143	690
R-28	--	09/12/2007		G	ND (0.2)	ND (0.2)	73.8	106	-99.4	29.9	--	-12.4	6.36	89.2	296	122	682
R-28	--	12/06/2007		G	ND (0.2)	ND (0.2)	75.7	96.5	-98.6	30.4	--	-11.7	6.62	79.4	258	139	--
R-28	--	04/02/2008		G	0.467	ND (1.0)	84.7	92.5	--	31.4	--	--	5.58	108	309	137	--
R-28	--	06/18/2008		G	ND (0.2)	ND (1.0)	43.3	89.4	-101.7	31.1	--	-13.2	6.95	93.9	248	132	672
R-28	--	09/17/2008		G	ND (0.2)	ND (0.5)	83.4	91.4	--	31.2	--	--	6.48	78	256	132	640
R-28	--	12/04/2008		G	0.262	ND (1.0)	81.7	97.4	-97	30	--	-11.89	5.95	114	260	135	649
R-28	--	01/21/2009		G	ND (0.2)	ND (0.5)	79.2	91.5	-96.7	27.8	--	-11.97	6.01	91.7	253	134	652
R-28	--	04/09/2009		G	ND (0.2)	ND (0.5)	79.6	92.7	-97.81	28.8	--	-12.43	5.44	97	250	138	643
R-28	--	07/08/2009		G	ND (0.2)	ND (0.5)	79.6	84.5	-98.62	27.3	--	-12.78	6.17	86.9	239	131	632
R-28	--	09/09/2009		G	ND (0.2)	ND (1.0)	74.8	86	-99.06	26.2	--	-12.47	6.01	78.7	236	131	640
R-28	--	12/14/2009		G	ND (0.2)	ND (1.0)	73.5	89.7	-98.33	26.7	--	-13.03	4.98	88.2	244	131	612
R-28	--	12/21/2010		G	ND (0.2)	ND (0.5)	69.1	91	-101.8	24.8	--	-12.1	4.75	87.8	223	133	602
R-28	--	06/08/2011		G	--	--	--	--	--	--	--	--	--	--	--	116	--
R-28	--	08/23/2011		G	--	--	--	--	--	--	--	--	--	--	--	115	--
R-28	--	11/30/2011		G	--	--	--	--	--	--	--	--	--	--	--	119	--
R-28	--	01/11/2012		G	ND (0.2)	ND (0.5)	70.2	80.5	--	27.4	--	--	4.76	83.7	218	127	--
R-28	--	02/29/2012		G	--	--	--	--	--	--	--	--	--	--	--	123	--
R-28	--	05/22/2012		G	--	--	--	--	--	--	--	--	--	--	--	124	--
R-28	--	08/22/2012		G	--	--	--	--	--	--	--	--	--	--	--	126	--
R-28	--	11/01/2012		G	ND (0.2)	ND (0.5)	71.3	75.4	-102.2	27.5	--	-12.6	4.12	79.3	212	132	499
R-28	--	01/09/2013		G	--	--	--	--	--	--	--	--	--	--	--	130	--
R-28	--	03/05/2013		G	--	--	--	--	--	--	--	--	--	--	--	122	--
R-28	--	05/21/2013		G	--	--	--	--	--	--	ND (0.5)	--	--	--	--	127	--
R-28	--	07/16/2013		G	--	--	--	--	--	--	ND (0.5)	--	--	--	--	124	--
R-28	--	11/21/2013		G	0.121	ND (0.5)	73.2	80.4	-103.05	26.2	0.293	-12.79	4.44	84.7	220	131	564
R-28	--	01/14/2014		G	--	--	--	--	--	--	0.315	--	--	--	--	--	--
R-28	--	03/13/2014		G	--	--	--	--	--	--	0.41	--	--	--	--	--	--
R-28	--	05/22/2014		G	--	--	--	--	--	--	0.27	--	--	--	--	--	--
R-28	--	07/16/2014		G	--	--	--	--	--	--	0.37	--	--	--	--	--	--
R-28	--	11/20/2014		G	0.13	ND (0.5)	68	85	-99.96	23	0.29	-12.26	4.5	88	230	130	620
R-28	--	01/15/2015		G	--	--	--	--	--	--	0.33	--	--	--	--	--	--
R-28	--	02/25/2015		G	--	--	--	--	--	--	0.44	--	--	--	--	--	--
R-28	--	06/09/2015		G	--	--	--	--	--	--	0.37	--	--	--	--	--	--
R-28	--	09/16/2015		G	--	--	--	--	--	--	0.34	--	--	--	--	--	--
R-28	--	12/09/2015		G	0.13	ND (1.0)	61	94	-97.4889	20	0.38	-11.8759	4.7 J	100	250	120	640
R-28	--	01/26/2016		G	--	--	--	--	--	--	0.47	--	--	--	--	--	--
R-28	--	01/26/2016	FD	--	--	--	--	--	--	--	0.46	--	--	--	--	--	--
R-28	--	02/24/2016		G	--	--	--	--	--	--	0.52	--	--	--	--	--	--
R-28	--	04/27/2016		G	--	--	--	--	--	--	0.42	--	--	--	--	--	--
R-28	--	07/07/2016		G	--	--	--	--	--	--	0.44	--	--	--	--	--	--
R-28	--	11/29/2016		G	0.21	ND (1.0)	67 J	92	-101.7	22	0.31	-12.71	4.5	91	240	130	--
R-28	--	11/29/2016	FD	--	0.21	ND (1.0)	64 J	96	-101.1	22	0.42	-12.15	4.5	91	240	130	--
R-28	--	01/24/2017		G	--	--	--	--	--	--	0.38	--	--	--	--	--	--
R-28	--	02/21/2017		G	--	--	--	--	--	--	0.46	--	--	--	--	--	--
R-28	--	05/11/2017		G	--	--	--	--	--	--	0.42	--	--	--	--	--	--
R-28	--	08/16/2017		G	--	--	--	--	--	--	0.39	--	--	--	--	--	--

Appendix I

Chemical Performance Monitoring Sampling Results, March 2005 through December 2019

Fourth Quarter 2019 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 Type	Sample Method	Boron, Dissolved (mg/L)	Bromide (mg/L)	Calcium, Dissolved (mg/L)	Chloride (mg/L)	Deuterium (‰)	Magnesium, Dissolved (mg/L)	Nitrate/Nitrite as Nitrogen (mg/L)	Oxygen-18 (‰)	Potassium, Dissolved (mg/L)	Sodium, Dissolved (mg/L)	Sulfate (mg/L)	Total Alkalinity as $CaCO_3$ (mg/L)	Total Dissolved Soilds (mg/L)
R-28	--	11/15/2017		G	0.12	ND (0.1)	60	91	-97.09	21	0.32	-12.42	4.0	88	230	130	580
R-28	--	01/03/2018		G	--	--	--	--	--	--	0.34	--	--	--	--	--	--
R-28	--	02/21/2018		G	--	--	--	--	--	--	0.48	--	--	--	--	--	--
R-28	--	06/12/2018		G	--	--	--	--	--	--	0.36	--	--	--	--	--	--
R-28	--	09/12/2018		G	--	--	--	--	--	--	0.36	--	--	--	--	--	--
R-28	--	12/11/2018		G	ND (0.13)	ND (0.5)	71	88	-97.19	25	0.29	-12.38	4.7	94	210	130	580
R-28	--	12/11/2018	FD	G	ND (0.13)	ND (0.5)	71	87	-98.12	25	0.28	-12.49	4.7	94	210	130	600
R-28	--	02/12/2019		G	--	--	--	--	--	--	0.32	--	--	--	--	--	--
R-28	--	03/19/2019		G	--	--	--	--	--	--	0.38	--	--	--	--	--	--
R-28	--	06/18/2019		G	--	--	--	--	--	--	0.38	--	--	--	--	--	--
R-28	--	08/21/2019		G	--	--	--	--	--	--	0.33	--	--	--	--	--	--
R-28	--	11/20/2019		G	0.17 J	ND (1.0)	68	87	-95.6	24	0.28	-11.66	4.4	90	210	130	580

Notes:

-- = not applicable or not reportable.

‰ = parts per thousand.

3V = three volume purge.

$CaCO_3$ = calcium carbonate.

DA = deep interval of Alluvial Aquifer.

FD = field duplicate.

G = grab sample.

H = HydraSleeve.

ID = identification.

J = concentration or reporting limit (RL) estimated by laboratory or data validation.

LF = Low Flow (minimal drawdown).

MA = mid-depth interval of Alluvial Aquifer.

mg/L = milligrams per liter.

ND = not detected at listed reporting limit.

SA = shallow interval of Alluvial Aquifer.

Arcadis U.S., Inc.

101 Creekside Ridge Court

Suite 200

Roseville, California 95678

Tel 916 786 0320

Fax 916 786 0366

www.arcadis.com