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May 10, 2019

Ms. Pamela Innis
U.S. Department of the Interior
CHF Remedial Project Manager
One North Central Avenue, Suite 800
Phoenix, AZ 85004-4427

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

Subject: **April 2019 Monthly Progress Report for the Final Groundwater Remedy Construction and Startup, PG&E Topock Compressor Station, Needles, California**
(Document ID: TPK_Monthly Progress Report_April 2019)

Dear Ms. Innis and Mr. Yue:

In compliance with the *1996 Corrective Action Consent Agreement* (CACA) (Attachment 6, Part E, Section 9a and Attachment 7) and the *2013 Remedial Design/Remedial Action Consent Decree* (CD) (¶32 and Appendix C, Section 5), and pursuant to the *Construction/ Remedial Action Work Plan* (C/RAWP) (Section 2.6.3.1), this monthly report describes activities taken at Pacific Gas and Electric Company's (PG&E's) Topock Compressor Station during April 2019 as well as activities planned for the next six weeks (May 5 through June 15, 2019), and presents available results from sampling and testing performed in April 2019.

In addition, this report discusses material deviations from the approved design documents and/or the C/RAWP, if any, that PG&E has proposed to the California Department of Toxic Substances Control (DTSC) and the U.S. Department of the Interior (DOI), or that have been approved by DTSC and DOI. This report also highlights key personnel changes, if any, and summarizes activities performed and activities planned in support of DOI's 2012 Community Involvement Plan and DTSC's 2013 Community Outreach Plan, as well as contacts with the local community, representatives of the press, and/or public interest groups, if any. This report also includes data from samples collected as part of the sitewide groundwater monitoring program within 60 days of sample collection, as required by the Condition of Approval # xi in DTSC's approval letter dated August 24, 2018.

Please note that since activities conducted to comply with the project's Applicable or Relevant and Appropriate Requirement (ARARs) and the Subsequent Environmental Impact Report (SEIR) mitigation measures are currently reported in separate compliance reports, this information is not repeated in the monthly reports.

Monthly progress reports will be submitted to DTSC and DOI by the 10th day of the following month during construction and start-up of the groundwater remedy at the Topock Compressor Station which officially began on October 2, 2018. This is the sixth monthly progress report. Please contact me at (760) 791-5884 if you have any questions or comments regarding this submittal.

Sincerely,

Curt Russell
Topock Project Manager

Topock Project Executive Abstract

Document Title: *April 2019 Monthly Progress Report for the Groundwater Remedy Construction and Startup, PG&E Topock Compressor Station, Needles, California*

Submitting Agency: DOI, DTSC

Final Document? ☒ Yes ☐ No

Date of Document: 5/10/2019

Who Created this Document?: (i.e. PG&E, DTSC, DOI, Other) PG&E

Priority Status: ☐ HIGH ☒ MED ☐ LOW

Is this time critical? ☐ Yes ☒ No

Action Required:

☒ Information Only ☐ Review & Input

☐ Other / Explain:

Type of Document:

☐ Draft ☒ Report ☐ Letter ☐ Memo

☐ Other / Explain:

What does this information pertain to?

- ☐ Resource Conservation and Recovery Act (RCRA) Facility Assessment (RFA)/Preliminary Assessment (PA)
- ☐ RCRA Facility Investigation (RFI)/Remedial Investigation (RI) (including Risk Assessment)
- ☐ Corrective Measures Study (CMS)/Feasibility Study (FS)
- ☒ Corrective Measures Implementation (CMI)/ Remedial Action(RA)
- ☐ California Environmental Quality Act (CEQA)/ Environmental Impact Report (EIR)
- ☐ Interim Measures
- ☐ Other / Explain:

Is this a Regulatory Requirement?

☒ Yes

☐ No

If no, why is the document needed?

What is the consequence of NOT doing this item? What is the consequence of DOING this item?

The consequence for not doing this item is PG&E will be out of compliance with the 1996 Corrective Action Consent Agreement (CACA) and the 2013 Remedial Design/ Remedial Action Consent Decree (CD), as well as the Construction/Remedial Action Work Plan (C/RAWP).

Other Justification/s:

☐ Permit ☐ Other / Explain:

Brief Summary of attached document:

This monthly report describes activities taken during April 2019 and activities planned for the next six weeks (May 5 through June 15, 2019) and presents available results from sampling and testing in April 2019. In addition, this report discusses material deviations from the approved design documents and/or the *Construction/ Remedial Action Work Plan* (C/RAWP), if any, that PG&E has proposed to the California Department of Toxic Substances Control (DTSC) and the U.S. Department of the Interior (DOI) or that have been approved by DTSC and DOI. This report also highlights key personnel changes, if any, and summarizes activities performed and activities planned at the Topock Compressor Station in support of DOI's 2012 Community Involvement Plan and DTSC's 2013 Community Outreach Plan, as well as contacts with local community, representatives of the press, and/or public interest groups, if any.

Written by: Pacific Gas and Electric Company

Recommendations:

Provide input to PG&E.

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

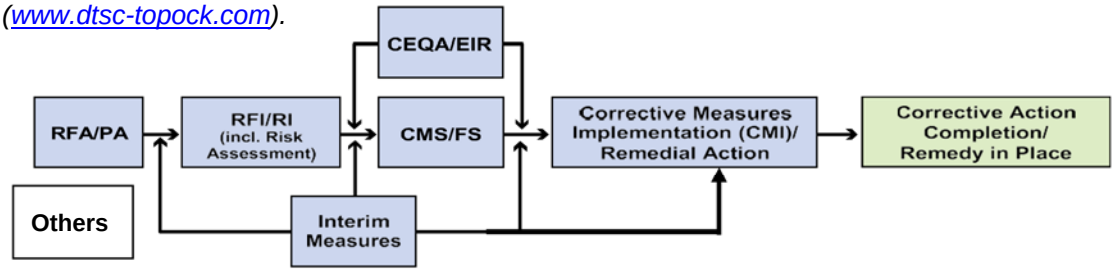
This submittal is required in compliance with the CACA, CD, and pursuant to the C/RAWP.

Other requirements of this information?

None.

Related Reports and Documents:

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



Legend
RFA/PA – RCRA Facility Assessment/Preliminary Assessment
RFI/RI – RCRA Facility Investigation/CERCLA Remedial Investigation (including Risk Assessment)
CMS/FS – RCRA Corrective Measure Study/CERCLA Feasibility Study

April 2019
Monthly Progress Report for the Final Groundwater Remedy Construction and Startup

PG&E Topock Compressor Station
Needles, California

Document ID: TPK_Monthly Progress Report_April 2019

May 2019

Prepared for
U.S. Department of the Interior and California Department of Toxic Substances Control

On Behalf of
Pacific Gas and Electric Company

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Acronyms and Abbreviations

µg/m^3	micrograms per cubic meter
AOC	Area of Concern
APE	Area of Potential Effect
ARAR	applicable or relevant and appropriate requirement
bgs	below ground surface
BLM	U.S. Bureau of Land Management
BMP	best management practice
CACA	Corrective Action Consent Agreement
C/RAWP	Construction/Remedial Action Work Plan
CD	Consent Decree
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CH2M	CH2M HILL, Inc.
CHQ	Construction Headquarters
DOI	United States Department of the Interior
DTSC	California Department of Toxic Substances Control
ERTC	Environmental Release to Construct
FCR	field contact representative
LOC	level of concern
NTH	National Trails Highway
PBA	Programmatic Biological Agreement
PG&E	Pacific Gas and Electric Company
RCRA	Resource Conservation and Recovery Act
SEIR	Subsequent Environmental Impact Report
SPY	Soil Processing Yard
SWPPP	Stormwater Pollution Prevention Plan
TCS	Topock Compressor Station
TRC	Technical Review Committee
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
WEAT	Worker Environmental Awareness Training
WVR	Work Variance Request

1. Introduction

Pacific Gas and Electric Company (PG&E) is implementing the final groundwater remedy to address chromium in groundwater near the PG&E Topock Compressor Station (TCS), located in eastern San Bernardino County 15 miles southeast of the city of Needles, California.

The U.S. Department of the Interior (DOI) is the lead federal agency overseeing remedial actions at the TCS. PG&E and the United States executed a Remedial Design/Remedial Action Consent Decree (CD), on behalf of the DOI, under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) in 2012, which was approved by the U.S. District Court for the Central District of California in November 2013 (DOI, 2013). Paragraph 32 and Appendix C (Section 5) of the CD requires PG&E to submit to DOI electronic progress reports during construction of the remedial action and on a quarterly basis after the selected remedy has been implemented and demonstrated to be operating as intended.

The California Department of Toxic Substances Control (DTSC) is the lead state agency overseeing corrective actions at the TCS. Remedial activities are being performed in conformance with the requirements of the Resource Conservation and Recovery Act (RCRA) Corrective Action pursuant to a Corrective Action Consent Agreement (CACA) entered into by PG&E and the DTSC in February 1996 (DTSC, 1996). Attachment 6, Part E, Section 9a and Attachment 7 of the CACA require PG&E to provide certain information in monthly progress reports during construction of the corrective action.

In compliance with the above CACA and CD requirements, PG&E proposed a template for the monthly progress reports in Exhibit 2.6-2 of the Construction/Remedial Action Work Plan (C/RAWP) (CH2M HILL, Inc. [CH2M], 2015b). The C/RAWP was approved by DOI on April 3, 2018 (DOI, 2018) and DTSC on April 24, 2018 (DTSC, 2018a).

This is the seventh of the monthly progress reports that will be submitted to DOI and DOI for the duration of the remedy construction and startup. This monthly progress report documents activities during April 2019, and follows the content and format described in Exhibit 2.6-2 of the approved C/RAWP. The report is organized as follows:

- **Section 2.1** describes completed construction activities; data collected, generated or received; nature and volume of waste generated; waste handling/disposal; issues encountered; actions taken to rectify problems/issues; personnel changes; and Work Variance Requests (WVRs; i.e., material deviations from the design documents, the C/RAWP, or other approved work plans), if any, as well as agencies' actions on those requests, and potential schedule impacts.
- **Section 2.2** summarizes contacts with representatives of the press, local community, or public interest groups during the reporting period, other activities provided to assist DTSC and/or DOI in support of the Community Outreach Plan (DTSC, 2013) and/or Community Involvement Plan (DOI, 2012), respectively, and anticipated near-term (approximately next six weeks) activities in support of the Community Outreach and Community Involvement Plans.
- **Section 2.3** describes the planned activities for the next six weeks (construction activities, sampling and monitoring events, etc.).
- **Section 2.4** provides information relating to the construction schedule progress, sequencing of activities, information regarding percentage of completion, unresolved delays encountered or anticipated that may affect the future schedule, and a description of efforts made to mitigate those delays or anticipated delays, if any.
- **Section 3** lists the references cited in this report.

Please note that since activities conducted to comply with the project's Applicable or Relevant and Appropriate Requirement (ARARs) and the Subsequent Environmental Impact Report (SEIR; DTSC, 2018b) mitigation measures are currently reported in separate compliance reports, the same information is not repeated in the monthly reports.

2. Monthly Update

2.1 Description of Activities and Work Completed

2.1.1 Work Completed

Highlights of key activities related to the construction of the groundwater remedy completed during March 2019 include the following (in chronological order):

- On July 13, 2018, PG&E sent via email the first weekly six-week look-ahead schedule for the remedy construction field work. The weekly emails provide highlights of field activities in the previous week, field activities scheduled for the next week, and planned activities for the next six weeks. Recipients of the weekly emails are DOI, DTSC, the U.S. Fish and Wildlife Service (USFWS), Tribes, and the Technical Review Committee (TRC). PG&E continues to send these weekly emails to date. As of April 30, 2019, a total of 41 six-week look-ahead schedule emails have been sent. **Of those, four six-week look-ahead schedule emails were sent in April 2019 (on April 8, 13, 20, and 27, 2019)**.
- On August 10, 2018, PG&E issued the first Environmental Release to Construct (ERTC) to contractors. As of April 30, 2019, a total of 43 ERTCs were issued for mobilization and construction activities (see Table 2-1). **Of those, three ERTCs were issued in April 2019.**
- Starting on October 4, 2018, PG&E has published a daily construction activities list and discussed the list at the morning tailboards with Tribes and agency representatives. This daily list is intended to inform and facilitate observation by Tribes and agency representatives on site on that day. PG&E continues to publish these daily lists and discuss the list at the daily morning tailboards to date. **In April 2019, a total of 25 daily construction activities lists were published and discussed at the morning tailboards.**
- In April 2019, PG&E completed the following construction activities (see Figures 2-1 and 2-2 for locations of key areas and wells, as well as select photos in **Attachment A**):
  - **Non-Well Construction Activities:**
    a) Completed placement of rip rap in the spillway area at the Construction Headquarters (CHQ).
    b) Completed grading, installation of the V-ditch, and placement of surface materials (rocks) at the CHQ.
  - **Pilot Boring/Well Installation Activities (Rotosonic drilling):**
    a) Completed drilling pilot borehole at RB-5. Backfilled with gravel.
    b) Completed drilling pilot borehole at RB-4. Backfilled with sand.
    c) Completed drilling and well installation at MW-10D.
    d) Completed development at MW-B, L, and N.
  - **Remedy Well Installation Activities (Dual Rotary drilling):**
    a) Complete remedy well installation at IRZ-20.
    b) See **Attachment B** for available information such as boring logs and water analytical results.
  - **Baseline/Opportunistic Soil Sampling Activities:**
    - Pursuant to the Baseline Soil Sampling and Analysis Plan (Appendix A of the Soil Management Plan [which is Appendix L of the C/RAWP]), one soil sample was collected at approximately 1 foot below ground surface (bgs) at IRZ-39 (sampled on April 1, 2019) and MW-S (sampled on April 11, 2019). In addition, baseline soil samples were collected at 1 foot below the bottom of Pipeline C, Segment C3 trench on April 10, 2019 (GRBS-08-BOT), and Segment C4 trench on April 17, 2019 (GRBS-09-BOT).

- See **Attachment C** for information about soil sampling locations and soil analytical results that are available at this time.

– **Perimeter Air Sampling Activities:**

a) Dust monitoring was conducted through April 30, 2019 at the perimeter of select work areas.

b) Perimeter air sampling for hexavalent chromium is performed at the perimeter of the work areas (outside of the exclusion zone) that are inside Areas of Concern (AOCs) within the construction footprint where hexavalent chromium concentrations in soil have been historically reported. No perimeter air sampling was conducted in April 2019.

c) See **Attachment D** for information about previous air sampling locations and air analytical results.

– **Noise Monitoring Activities:**

a) Noise monitoring is conducted at pre-approved locations closest to the construction activities. Through April 30, 2019, noise monitoring was conducted at the following pre-approved locations:

- Location west of the mobile home park at Moabi Regional Park,
- Location Maze B Combined Area 1/2,
- Location Maze B Combined Area 1/2 - Alternate,
- Location Maze C Area 1,
- Location Maze A Area 1 - Alternate, 2, and 3

b) See **Attachment E** for information about pre-approved noise monitoring locations and a summary of noise monitoring data available to date.

2.1.2 Work Already Underway and During Implementation

As of April 30, 2019, PG&E has started and will continue to perform the following activities:

- Continue trenching and installation of pipelines/conduits along Pipeline C alignment in the floodplain.
- Continue drilling and installation of remedy well at IRZ-25 with the dual rotary drill rig.
- Start well development at remedy well IRZ-20.
- Continue well installation and development at MW-U.
- Complete borehole drilling, well installation, and development at MW-M.
- Continue well development and sampling.
- Complete the upgrade of the Brine Tanks containment at MW-20 Bench.
- Continue watering of the transplanted plants at the approved location off NTH (except when it rains).
- Continue to conduct noise and dust monitoring and inspection of Stormwater Pollution Prevention Plan (SWPPP) Best Management Practices (BMPs).
- Continue to track and manage waste generated.
- Continue to manage displaced soil per the approved Soil Management Plan (Appendix L of the C/RAWP).

2.1.3 Freshwater Usage, Waste Generation and Management

As of April 30, 2019, the volumes of freshwater used for remedy construction and waste streams generated from remedy construction (starting on October 2, 2018) are as follows:

- Approximately 1,235,150 gallons (3.8 acre-feet) of freshwater was used, of which an approximate 3 percent was for pilot boring/well installation and general construction activities and 97 percent was for fugitive dust suppression.
- Approximately 159.3 cubic yards of drill cuttings were generated from well drilling and geotechnical investigation. Of those, approximately 1.3 cubic yards are clay from Pipeline F geotechnical investigation. Drill cuttings are typically stored in roll-off bins with closed tops. Samples are collected from the bins for characterization and analyzed in accordance with the Soil Management Plan. Based on analytical results obtained to date, soil has been classified as clean and is stockpiled at the SPY for reuse onsite.
    - Note that per DOI's direction, the clay collected from the Pipeline F geotechnical investigation is stockpiled at the SPY, separate from the other clean soil.
- Approximately 100 cubic yards of displaced soil was generated from excavation for the brine tanks containment upgrade at the MW-20 Bench. Samples were collected for characterization and analyzed in accordance with the Soil Management Plan. This soil is currently stockpiled on a plastic liner at the SPY. A decision on the final disposition of this soil is forthcoming.
- Approximately 20 cubic yards of displaced soil was generated from potholing activities to a) daylight the Frontier telecom line along Pipeline C on NTH and b) pre-characterize soil in preparation for construction activities at the MW-20 Bench. Samples were collected for characterization and analyzed in accordance with the Soil Management Plan. This soil is currently stored in bins at the SPY. A decision on the final disposition of this soil is forthcoming.
- Approximately 75,706 gallons of wastewater were generated from drilling operations. At each sonic drilling location, the wastewater is initially stored in a holding tank in the primary work zone, and is transferred from the primary work zone, as needed, to 20,000-gallon frac tanks located at the MW-20 Bench. Each transfer load is tracked. At each dual rotary drilling location, freshwater and wastewater are conveyed between the frac tanks and the drilling location via pipes. Once a frac tank is full, its contents will be characterized and managed in accordance with the approved Waste Management Plan (Appendix R of the C/RAWP).
    - One wastewater frac tank was sampled on April 2, 2019. Analytical results indicated that the wastewater is of acceptable quality for disposal at the Compressor Station evaporation pond #4. Approximately 9,478 gallons of wastewater was discharged to pond #4 on April 13, 2019.
    - One wastewater frac tank was sampled on April 12, 2019. Analytical results indicated that the wastewater is of acceptable quality for disposal at the Compressor Station evaporation pond #4. Due to the size of the wastewater truck, approximately 9,622 (3 loads) and 5,718 (2 loads) gallons of wastewater from the sampled tank was discharged to pond #4 on April 23 and 24, 2019, respectively.
- Approximately 150 cubic yards of general construction waste, 78 cubic yards of recyclables, 164.7 tons of green waste, and 5.1 tons of construction debris (solids from concrete washouts) were generated and transported to Republic Services in Lake Havasu City for disposal and management.
- Sanitary waste from construction trailers/portable toilets that is hauled offsite as needed.

2.1.4 Worker Training and Education

- PG&E continues to provide the mandatory Site Health and Safety Training for its employees and contractors on a daily basis. As of April 30, 2019, a total of 72 health and safety training sessions were held and 285 employees and contractors received the training. **Of those, in April 2019, seven sessions were conducted and 22 employees/contractors were trained.** After the training, the attendees signed the training roster.
- PG&E continues to provide the mandatory Worker Environmental Awareness Training (WEAT) to its employees and contractors that will be involved in the remedy construction project. The training is offered regularly on Mondays and Thursdays, and more frequently as needed. As of April 30, 2019, a total of 74 WEAT sessions were conducted and 330 employees and contractors received the training. **Of those, in April 2019, 9 sessions were conducted (on 4/4, 4/8, 4/11, 4/15, 4/16, 4/18, 4/22, 4/25**

(twice)) and 33 employees/contractors were trained. Educational brochures are made available to attendees of the training; they are designed to reinforce the key topics and highlight the take-aways discussed during the classroom training. After the training, the attendees signed the training roster.

- PG&E's onsite biologist also trained Field Contact Representatives (FCRs), who will be responsible for compliance with biological avoidance and mitigation measures. As of March 31, 2019, a total of 10 FCR training sessions were conducted and 54 employees and contractors received the training. **No FCR training was conducted in April 2019.**
- Training records are kept electronically and at the temporary construction trailers at the SPY. The records are available upon request.

2.1.5 Status of Work Variance Requests

PG&E submitted one request for work variance in April 2019. See Table 2-2 for information regarding activities related to previously proposed WVRs (i.e., material deviations from the design documents, the C/RAWP, or other approved work plans), and agencies' actions on those requests.

2.1.6 Use of Future Activity Allowance

There was no proposed use of Future Activity Allowance (FAA) to date.

2.1.7 Issues Encountered and Actions Taken to Rectify Issues/Problems

- While PG&E continues efforts to minimize construction footprint, five additional locations have been identified as needing to be expanded beyond the current designated work areas (or maximum construction footprint). In accordance to the General Management Measure # 16 of the Programmatic Biological Agreement (PBA) (CH2M, 2014), on April 25, 2019, PG&E sought approvals from BLM, USFWS, and CDFW prior to construction. Note that all construction work is still being conducted inside the Area of Potential Effects (APE) and the SEIR Project Area.
- On April 16, 2019, USFWS (representing DOI), DTSC, and PG&E conducted a field review of the designed location of the energy dissipator at the end of the V-ditch at the CHQ. This location as designed is outside of the designated work area as defined in the PBA. DTSC asked if the energy dissipator could be located within the approved CHQ footprint to avoid expansion beyond the designated work area. Both the construction contractor (PIVOX) and the Designer of Record (DoR) were consulted. PIVOX Construction Manager stated that moving the dissipator inside the current max construction footprint (near the southeast corner of the CHQ) would be acceptable from an operation perspective and would not negatively affect the functionality of the immediate area. The DoR stated that the new location inside the CHQ footprint appears to be satisfactory for keeping run-on from outside the CHQ fencing from getting onto the CHQ. Since this a minor change, PG&E requested DTSC's and DOI's concurrence to proceed with this field change. DTSC and DOI provided concurrence on April 17, 2019. A redline drawing was provided to the agencies on April 25, 2019.
- PG&E continues to work with Frontier to resolve the conflict between their telecom line and Pipeline Segments C13, C15, and C16, in the shoulder of NTH.
- PG&E is evaluating options to keep the well and valve vaults at IRZ-35 in the shoulder of NTH (a requirement of the San Bernardino County Excavation Permit), while avoiding cutting into the I-40 hill.
- Based on the October 2018 geotechnical investigation results, construction of the segment of Pipeline F along the TCS entrance road would require installation of over 40 soldier piles using a large drill rig. Once drilling starts, the drill rig cannot be moved and therefore, would severely restrict access to TCS for about 12 working days. This is not acceptable for Compressor Station operations. As a result, PG&E will propose to reroute Pipeline F along the approved Pipelines J and B alignment. PG&E plans to submit a work variance request for Pipeline F in May 2019.
- In early April 2019, the Health and Safety manager for Phase 1 remedy construction (Matt Michaelian from Advanced Environmental Group, Inc. [AEG]) evaluated the approved access route to the approved noise monitoring location for MW-U (Maze A-Area 1). This route was deemed unsafe by

AEG, therefore, site remediation contractors were not allowed to use this route for project-related activities. PG&E notified DTSC of this finding on April 12, 2019. Jacobs' Noise Engineer, Mark Bastasch, was consulted to evaluate alternate locations that are available at this time. In light of the governing factors (safety, inputs received from the May 10, 2018 site walks, etc.) a monitoring location in I-40 median, that is equidistant to MW-U, was selected. Two monitoring events were conducted on April 16 and 17, 2019 at the alternate location. See Appendix E for a summary of the sound data collected at the alternate location and the decision to suspend sound data collection at this location..

- On April 9, 2019, the Driller made an 18" casing connection to begin drilling at well IRZ-20 after resuming drilling after a 4-day break. As he turned the downhole air on and before the borehole could clear itself through the drill rod, a "blowout" occurred where water in the borehole discharged out the annular space between the 24" conductor and the 18" casing. Approximately 20 gallons of freshwater/aquifer water mixture was released into the secondary containment and nearby soil. The water in the secondary containment was placed into roll-off bins.
  - **Root cause** – The pressure in the borehole and the drill pipe must be equalized to the same pressure before starting drilling. In this case, the borehole and drill pipe did not equal out, causing the air pressure to lift the borehole water up and around the 24" casing.
  - **Corrective action to prevent reoccurrence** – Crew stopped work, identified the issue and notified PG&E. A sample of the discharged water was collected and analyzed by the IM-3 lab for Cr+6. Cr+6 was not detected in the water sample, therefore, the wet soil was left in place. The driller modified the drilling methodology from using an interchange to a turn-around sub that will better equalize the pressure between the borehole and the drill pipe. In addition, going forward, an enhanced BMP will be required for dual rotary drilling to prevent water collected inside secondary containment from releasing onto the ground.
- On April 11, 2019, as the Driller was pumping water from the roll-off to the wastewater frac tank, he noticed the water was overflowing from the top of the wastewater tank and onto the ground. Approximately 20 gallons of freshwater/aquifer water overflowed into the secondary containment. Of the 20 gallons overflowed, approximately 5-10 gallons were released onto the ground.
  - **Root cause** – The crew was unaware of the water level while pumping from the roll-off to the wastewater frac tank. Coordination with the Well Construction Support team did not occur.
  - **Corrective action to prevent reoccurrence** – Crew stopped work, identified the issue and notified PG&E. A sample of the discharged water was collected and analyzed by the IM-3 lab for Cr+6. Cr+6 was not detected in the water sample, therefore, the wet soil was left in place. Prior to pumping wastewater in frac tanks, coordination with Well Construction Support team will occur and water level will be measured using a water level tube.

2.1.8 Key Personnel Changes

There was no change to key PG&E project personnel in April 2019.

2.2 Communication with the Public

PG&E does not have any key communications with the public in April 2019.

2.3 Planned Activities for Next Six Weeks

The planned activities for next six weeks (May 5 through June 15, 2019) include the following:

- Well installation activities:
  - Complete installation of wells MW-M and IRZ-25.
  - Start site preparation and drilling pilot borehole at RB-2.
  - Start site preparation at MW-C in the floodplain and MW-X in Arizona.
  - Start well installation at IRZ-21 and IRZ-23 using dual rotary rig.

  - Start drilling at MW-S and IRZ-37.
- Non-well construction activities:
  - Conduct pre-characterization of soil along planned pipeline alignment and in infrastructure location within AOCs.
  - Continue to install Pipeline C electrical conduits and liquid conveyance pipelines in the floodplain.
  - Install access road in the floodplain.
  - Perform hydrostatic testing of installed Pipeline C segments.
  - Complete the upgrade of Brine Tanks containment at the MW-20 Bench.
  - Continue to conduct noise and dust monitoring and inspection of SWPPP BMPs.
  - Continue to log and manage waste generated.
  - Continue to manage displaced soil per the approved Soil Management Plan.

Attachment F contains the six-week look-ahead schedule available at this time. Any adjustments to the schedule will occur as needed via the weekly emails (sent at the end of each week) and/or the daily list of construction activities (published daily and discussed with agency and Tribal representatives on site on that day).

2.4 Construction Schedule Review

Phase 1 of the groundwater remedy construction started on October 2, 2018. Table 2-3 presents a summary of the percent completeness for key construction activities as of April 30, 2019. PG&E continues to evaluate and optimize the construction schedule.

2.5 Available Sitewide Groundwater Monitoring Data (DTSC Condition of Approval xi)

Pursuant to Condition of Approval # xi in DTSC's approval letter dated August 24, 2018 (DTSC, 2018a), PG&E is required to report data from samples collected as part of the sitewide groundwater monitoring program within 60 days of sample collection. In compliance with this requirement, PG&E submitted validated data to DTSC via monthly emails. For ease of recordkeeping and to minimize the number of ad-hoc compliance reports/emails, PG&E has included validated data in each monthly progress report starting with the November 2018 report (see **Attachment G**).

3. References

California Department of Toxic Substances Control (DTSC). 1996. *Corrective Action Consent Agreement (Revised), Pacific Gas and Electric Company's Topock Compressor Station, Needles, California. EPA ID No. CAT080011729.* February 2.

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Tables

Table 2-1 Summary of Environmental Release-To-Constructions (ERTCs) Issued to Contractors

April 2019 Monthly Progress Report for the Final Groundwater Remedy Construction and Startup

PG&E Topock Compressor Station, Needles, California

ERTC No.	Brief Description of Covered Areas and Scope of Authorized Activities	Issue Date
Non-Well ERTCs		
1	Initial mobilization activities at the Construction Headquarters (CHQ), Soil Processing Yard (SPY), and three staging areas (#9 Parking area off I-40, #18 MW-20 Bench, and #23 Transwestern Bench). Scope included installation of temporary construction trailers, portable generators, SWPPP BMPs, construction signages, and temporary construction fencing, as well as equipment staging and truck inspections.	August 10, 2018
Addendum 1 to ERTC #1	Scope included setup of wastewater and freshwater storage tanks at MW-20 Bench, improvement of the access road at the CHQ, installation of perimeter fence at the SPY, and grading at SPY.	September 21, 2018
Addendum 2 to ERTC #1	Scope included grading for drill rig setup at IRZ-20.	October 4, 2018
Addendum 3 to ERTC #1	Scope included geotechnical investigation in the footprint of the future Carbon Amendment building at the MW-20 Bench.	October 9, 2018
Addendum 4 to ERTC #1	Scope included the installation of a temporary handrail along the walkway from the MW-20 Bench to the floodplain.	December 28, 2018
2	Scope included the installation of the temporary construction water system and construction water tanks at Area #25 Route 66 Welcome Sign.	September 28, 2018
3	Scope included the installation of the Public Information Trailer, a fugitive dust sign, an information kiosk, and a construction delivery sign at the northwest corner of Park Moabi Road and National Trails Highway (NTH).	September 4, 2018
4	Scope included the installation of a truck containment pad at the TCS evaporation ponds and maintenance of the access road to the ponds.	September 24, 2018
6	Scope included the geotechnical investigation along Pipeline F alignment (on the Compressor Station entrance road).	October 3, 2018
7	Scope included the installation of traffic control along the southern end of NTH per the Traffic Control Plan.	September 17, 2018
9	Scope included the transplantation and planting of sensitive plants.	November 9, 2018
10	Scope included potholing activities along approved pipeline alignments and in building footprints, that are also in AOCs/SMWUs. The purpose is to pre-characterize soil in preparation for construction.	March 29, 2019
11	Scope included preparation of temporary staging areas, vegetation clearance, placement of stabilization mats, potholing in select locations, and installation of Pipeline C segments C1 through C6 in the floodplain.	January 3, 2019
11a	Scope included preparation of temporary staging areas, vegetation clearance, placement of stabilization mats, potholing in select locations, and installation of Pipeline C segments C7-C10, and C17 in the floodplain	February 11, 2019
12	Scope included non-intrusive site preparation work for the brine tanks containment upgrade on the MW-20 Bench (per Work Variance Request #1, see Table 2-2). A forthcoming addendum to this ERTC will be issued to include the actual upgrade activities.	January 10, 2019
12a	Scope included the actual brine tanks containment upgrade activities which include intrusive work on the MW-20 Bench (per Work Variance Request #1, see Table 2-2).	February 6, 2019
Well ERTCs		
5a	Scope included the site setup, drilling, testing, and demobilization at MW-L.	September 27, 2018
5b	Scope included the placement of soil stabilization mats in the floodplain, setup of a temporary staging area near the north end of the access route in the floodplain, rig setup, installation of snow fence to protect plants, drilling, testing, and demobilization at IRZ-15.	October 12, 2018
5c	Scope included the site setup, drilling, testing, and demobilization at IRZ-20 on the MW-20 Bench.	October 15, 2018
5d	Scope included the site setup, drilling, testing, and demobilization at MW-E on the MW-20 Bench.	October 29, 2018

Table 2-1 Summary of Environmental Release-To-Constructions (ERTCs) Issued to Contractors

April 2019 Monthly Progress Report for the Final Groundwater Remedy Construction and Startup
PG&E Topock Compressor Station, Needles, California

ERTC No.	Brief Description of Covered Areas and Scope of Authorized Activities	Issue Date
5e	Scope included the site setup, drilling, testing, and demobilization at MW-N in the upland.	November 15, 2018
5f	Scope included the site setup, drilling, testing, and demobilization at IRZ-13 in the floodplain.	November 7, 2018
5g	Scope included the site setup, drilling, testing, and demobilization at IRZ-23 on the MW-20 Bench.	November 8, 2018
5h	Scope included the site setup, drilling, testing, and demobilization at MW-M in the upland.	January 15, 2019
5i	Scope included the site setup, drilling, testing, and demobilization at IRZ-9 in the floodplain.	November 28, 2018
5j	Scope included the site setup, drilling, testing, and demobilization at IRZ-25 on the MW-20 Bench.	December 3, 2018
5k	Scope included the site setup, drilling, testing, and demobilization at IRZ-21 on the MW-20 Bench.	December 9, 2018
5l	Scope included the site setup, drilling, testing, and demobilization at MW-B in the floodplain.	December 10, 2018
Addendum to ERTC #5l	Scope included the setup of an additional temporary equipment and material staging area in the floodplain.	December 13, 2018
5m	Scope included the site setup, drilling, testing, and demobilization at MW-F along NTH.	December 17, 2018
5n	Scope included the site setup, drilling, testing, and demobilization at IRZ-11 in the floodplain.	December 17, 2018
5o	Scope included the site setup, drilling, testing, and demobilization at MW-X and MW-Y' in Arizona.	April 23, 2019
5p	Scope included the site setup, drilling, testing, and demobilization at MW-G along NTH.	January 14, 2019
5q	Scope included the site setup, drilling, testing, and demobilization at IRZ-16 and IRZ-17 in the floodplain.	February 14, 2019
5r	Scope included the site setup, drilling, testing, and demobilization at IRZ-27 and IRZ-29 along NTH. Also included in the scope are potholing activities along Pipeline C Segments C13, C15, and C16 and on the MW-20 Bench.	March 9, 2019
Addendum #1 to ERTC #5r	Scope included the potholing to locate Transwestern Gas Pipeline within NTH (in support of Pipeline C installation).	April 24, 2019
5s	Scope included the site setup, drilling, testing, and demobilization at IRZ-39 in the low area, north of the Transwestern Bench.	March 12, 2019
5t	Scope included the site setup, drilling, testing, and demobilization at IRZ-27 along NTH.	March 19, 2019
5u	Scope included the site setup, drilling, testing, and demobilization at MW-U in I-40 median.	March 22, 2019
5v	Scope included the site setup, drilling, testing, and demobilization at MW-10D in Bat Cave Wash.	March 27, 2019
5w	Scope included the site setup, drilling, testing, and demobilization at MW-W in the floodplain.	March 22, 2019
5x	Scope included the site setup, drilling, testing, and demobilization at RB-1 through 5 wells and MW-O in the floodplain.	March 30, 2019
5y	Scope included the site setup, drilling, testing, and demobilization at MW-S on the access road to Bat Cave Wash	April 12, 2019

Note:
ERTC 8 (Wastewater Management) is under development.

Table 2-2 Summary of Work Variance Requests (WVRs)

April 2019 Monthly Progress Report for the Final Groundwater Remedy Construction and Startup
PG&E Topock Compressor Station, Needles, California

WVR No.	Brief Description of Work Variance Request	Approval Dates
1	This WVR addressed PG&E's proposed modification to the brine tanks containment for use by the remedy, specifically: • **Upgrade the existing lined containment to concrete** - The original synthetic liner material has degraded from exposure to UV light, heat, and abrasion and must be replaced. PG&E proposed to replace the synthetic-lined containment (including K-rails) with a concrete containment to support the groundwater remedy. The concrete color will be desert tan, and information on this proposed concrete color will be submitted to the agencies for review. The proposed concrete material will be similar to the material of the truck lane in the final remedy design (see Appendix E of the Final Basis of Design Report (CH2M, 2015a),* Section 033 00, Cast-In-Place Concrete). • **Shorten the length of the containment** - This containment will have the same height as the existing containment, but with a slightly smaller footprint (the length is 5 feet shorter). This smaller footprint still meets the required volume for a secondary containment and allows for more space for remedy construction at the tight MW-20 bench.	DOI approved WVR #1 on June 22, 2018 DTSC approved WVR #1 on July 5, 2018
2	PG&E proposed to relocate the tie-in point for remedy construction water to an aboveground location inside TCS and below the TCS Water Storage Tanks. This is to eliminate the risk of damaging the existing pressurized 6-inch water line and to avoid any interference with PG&E Gas Operations control of the Station's water supply. The WVR addressed this relocation, specifically: • **Relocate the construction water tie-in point to an aboveground location below the TCS Water Storage Tanks, inside TCS** – The final design calls for the temporary construction water line to hot-tap into the existing 6-inch steel water line just as the line turns southwest to continue to TCS. PG&E proposed to move the tie-in point to an aboveground valve manifold, located below the TCS Water Storage Tanks in the boneyard area. • **Extend the temporary construction water line to the new tie-in point, along Pipeline 300A access road** – The planned 4-inch high-density polyethylene (HDPE) temporary construction water line will be extended, following the route of the Pipeline 300A access road, to the new tie-in point inside TCS. This pipeline extension is approximately 1,950 feet and is also made of 4-inch HDPE. The pipe will be laid on ground surface and to the south of the 6-inch water line where possible. At the crossing with the SoCal Gas pipeline access road, the pipeline will be at grade with fill to allow for vehicle crossing.	DOI/DTSC approved WVR #2 on August 29, 2018
3	PG&E proposed changes within the CHQ fence line to avoid/minimize the overall amount of soil disturbance during construction, reduce the number of truck trips to haul wastewater, and allow for additional working space within the yard. There are no proposed changes to the CHQ footprint nor its fence line. The specifics are described below: • **Relocate the decontamination pad from the western fence to the northern fence (near the western corner)**. Based on recent survey data collected during construction, the difference in ground elevation between northern and southern end of the pad is about 4 feet. Moving the pad to the northern fence would eliminate the difference in ground elevation and reduce the amount of soil disturbance by at least 80 cubic yards. • **Bring the remedy-produced wastewater tank from belowground to aboveground, increase the tank volume from 1,000 to 2,500 gallons, and place the aboveground, double-walled tank adjacent to the decontamination pad.** The change from belowground to aboveground reduces the amount of soil disturbance by at least 50 cubic yards. The change to a bigger tank will reduce the amount of truck trips needed to haul wastewater. The placement of the tank adjacent to the decontamination pad allows for the pad to function as a secondary containment for the haul truck during off-loading of the wastewater. • **Defer construction of the underground sewage tanks.** Deferral of the underground tanks reduces the overall amount of soil disturbance by at least 800 cubic yards. All sanitary wastes will be managed in aboveground sewage tanks (similar to the ones currently used for the SPY trailers) or portable toilets. • **Swap the location of the construction trailers and the sunshade and change the configuration of the sunshade from a rectangle to a square.** This change will allow for more working space within the CHQ. All functions that would occur in the Workshop/Sampling Processing building will be conducted in the construction trailers.	DOI/DTSC approved WVR #3 on January 4, 2019
4	PG&E proposed to revise a segment of Pipeline C near the I-40 bridge, to meet the permit requirement in Caltrans Encroachment Permit No. 08-18-6-MW-0533. The revision involves relocating a small segment of Pipeline C to within National Trails Highway to meet a minimum distance of 10 feet from current and future I-40 bridge footings. The treatment measure specified	TBD

Table 2-2 Summary of Work Variance Requests (WVRs)

April 2019 Monthly Progress Report for the Final Groundwater Remedy Construction and Startup
PG&E Topock Compressor Station, Needles, California

WVR No.	Brief Description of Work Variance Request	Approval Dates
	for Segment X of National Trails Highway in the Cultural and Historic Property Management Plan will be implemented during installation of this pipeline segment.	

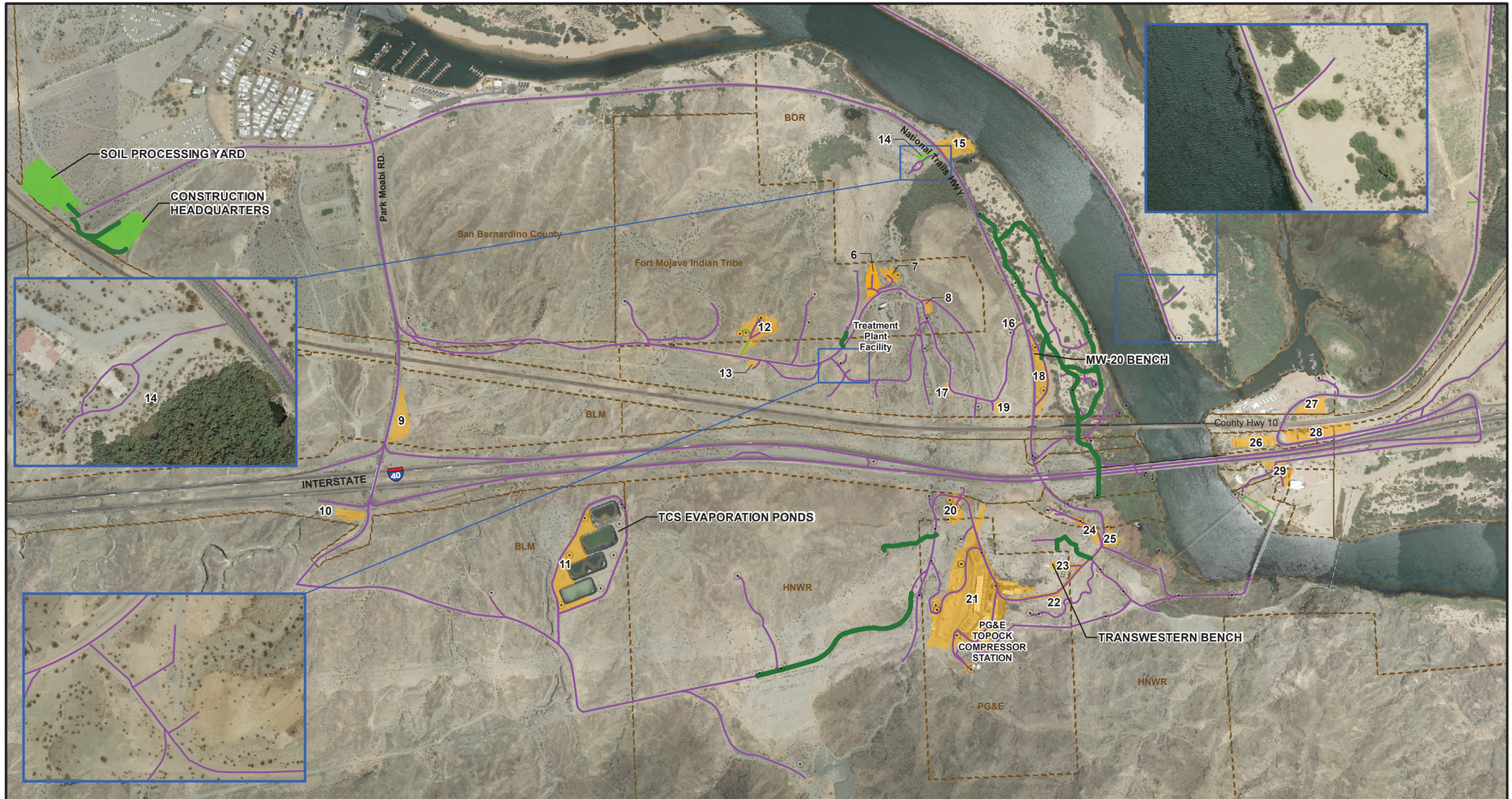
Note:
* CH2M HILL, Inc. (CH2M). 2015a. *Basis of Design Report/Final (100%) Design Submittal for the Final Groundwater Remedy, PG&E Topock Compressor Station, Needles, California*. November 18.

Table 2-3 Summary of Percent Completeness of Key Construction Activities

April 2019 Monthly Progress Report for the Final Groundwater Remedy Construction and Startup
PG&E Topock Compressor Station, Needles, California

Activity	% Complete	Current Status of Construction Activities (as of March 31, 2019)
Project signage & Public Information Office	100%	Complete.
Staging Area 9 setup	100%	Complete.
Staging Area 23 setup	100%	Complete.
Staging Area 18 setup	100%	Complete.
Temporary construction offices at Soil Processing Yard	100%	Complete.
Soil Processing Yard setup for construction staging	100%	Complete.
National Trails Highway lane closure and traffic control installation	100%	Complete.
Temporary construction water line	100%	Complete.
TCS Ponds concrete containment pad	100%	Complete.
Construction Headquarters access road	100%	Complete.
MW-L	100%	Complete.
MW-N	100%	Complete.
Pipeline C Segments C1 through C10	Not Available	Electrical conduit and piping installation underway.
Brine Tanks containment upgrade	Not Available	Completed excavation, backfill, compaction, and concrete pour.
MW-B	95%	Well construction complete. Development in progress.
MW-E	95%	Well construction complete. Development in progress.
MW-F	95%	Well construction complete. Surface completion in May.
MW-G	95%	Well construction complete. Surface completion in May
MW-W	95%	Well construction complete. Surface completion in May.
MW-10D	95%	Well construction complete. Surface completion in May.
MW-M	Not Available	Well construction complete. Surface completion and well development in May.
MW-O	Not Available	In progress
RB-5, RB-4, RB-3, IRZ-9, 13, 15, 16, 17, 20, 21, 23, 25, 27, and 39 pilot boring	100%	Complete.
IRZ-20 remedy well	Not Available	Well construction complete.

Figures



LEGEND

- Existing Access Route (will continue to be used for remedial activities)
- Existing Route (to be used as is for access to remedial activities)
- Roads to be improved or constructed for groundwater remedy
- Soil Processing (Area #5) and Construction Headquarter (Area #4) for Remediation Project
- Staging Areas for Remediation Project

Notes:

1. Decontamination pads will be located in Area #4 (Construction Headquarters), Area #21 (Topock Compressor Station), and Area #23 (Transwestern Bench).
2. Areas #15, 16, 17, 19, and 20 will not be used as staging areas. Areas #16, 17, and 19 may be part of the primary work zones for remedy infrastructure along the access road.
3. Area #20 may be part of the primary work zone for installation of future provisional well IRL-6 (if determined to be needed in the future) and associated piping/concrete/vault.
4. Public roadways outside of the EIR project area and the APE can also be used for remedy implementation.

N

0 900

Feet

FIGURE 2.1-1
CONSTRUCTION SITE PLAN AND ACCESS ROUTES

GROUNDWATER REMEDY CONSTRUCTION/ PHASE 1
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

JACOBS

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LEGEND

- Property Boundaries

Existing Wells:

- Extraction Well
- Injection Well
- Monitoring Well
- Water Supply Well

Planned Wells:

- Extraction, National Trails Highway (NTH) In-situ Reactive Zone (IRZ)
- Extraction, Riverbank
- Injection, NTH IRZ
- Injection, Topock Compressor Station
- Remedy Monitoring Well
- Recirculation Well

Pipeline Corridor for Remedy

- Aboveground Pipe
- Underground Pipe/Conduit

Remedy Facilities

- Planned Transformer
- Future Provisional Transformer
- Proposed Remedy Structure

Note:

1. Note that in compliance with EIR mitigation measure CUL-1a-9, as well as PA and CHPMP mitigation measures, the pipeline along the dirt road west of National Trails Hwy is located in an existing, previously disturbed, access road. In addition, the location of the road and pipeline was field verified and does not create any direct physical impact or effect on the Topock Maze, as it is manifested archaeologically, in compliance with EIR mitigation measure CUL-1a-10, PA, and CHPMP mitigation measures.
2. All well and structure locations are approximate.

N

0 150 300 600

Feet

FIGURE 2-2
WELL AND PIPELINE LOCATIONS
GROUNDWATER REMEDY PHASE 1 CONSTRUCTION
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

JACOBS

Path: R:\ENBG\00_Proj\P\PGE\Topock\MapFiles\2018\CMS\Phase1Construction\Fig2-2_Well_Pipeline_Loc.mxd

Attachment A
Photographs

Dual Rotary Rig at IRZ-25

Sonic Rig at RB-3

Pipe Installation at Segment C3

Installation of Geofabric and RipRap at the CHQ

Sonic Rig at MW-10 D in Bat Cave Wash

Sonic Rig at MW-U

Attachment B
Available Boring Logs and Groundwater Sample Results from Well Drilling

Table B-1. Groundwater Sampling Results for April 2019

April 2019 Monthly Progress Report for the Final Groundwater Remedy Construction and Startup
PG&E Topock Compressor Station, Needles, California

Location	Sample ID	Sample Date	Depth Interval (ft bgs)	Total Dissolved Chromium (µg/L)	Hexavalent Chromium (µg/L)
MW-10D	MW-10D-041119	04/11/19	108 - 123	160	160
MW-10D	MW-10D-VAS-107-112	04/01/19	107 - 112	95	96
MW-10D	MW-10D-VAS-118-123	04/02/19	118 - 123	200	190
MW-B	MW-B-VAS-27-32	01/06/19	27 - 32	5.9 J	7.7J
MW-B	MW-B-VAS-47-52	01/09/19	47 - 52	< 0.13 U	< 0.17 U
MW-B	MW-B-VAS-67-72	01/09/19	67 - 72	< 0.13 U	< 0.17 U
MW-B	MW-B-VAS-102-107	01/10/19	102 - 107	< 0.13 U	< 0.17 U
MW-B	MW-B-VAS-142-147	01/15/19	142 - 147	< 0.13 U	< 0.17 U
MW-B	MW-B-VAS-182-187	02/13/19	182 - 187	< 0.13 U	< 0.17 U
MW-B	MW-B-VAS-207-212	02/14/19	207 - 212	< 0.13 U	< 0.17 U
MW-B	MW-B-VAS-247-252	02/17/19	247 - 252	11 J	< 0.83 U
MW-B	MW-B-VAS-264-269	02/18/19	264 - 269	< 0.13 U	< 0.33 U
MW-B	MW-B-VAS-287-292	02/20/19	287 - 292	< 0.13 U	< 0.17 U
MW-B	MW-B-VAS-317-322	02/21/19	317 - 322	< 0.13 U	< 0.17 U
MW-B	MW-B-VAS-339-344	02/27/19	339 - 344	< 0.13 U	< 0.33 U
MW-B	MW-B-VAS-352-357	02/28/19	352 - 357	0.603 J	< 0.33 U
MW-B	MW-B-117-033019	03/30/19	WD, 117	< 0.13 U	< 0.17 U
MW-B	MW-B-33-033119	03/31/19	WD, 33	3.7	2.3
MW-E	MW-E-VAS-52-57	11/05/18	52 - 57	7800	7000
MW-E	MW-E-VAS-82-87	11/06/18	82 - 87	190	200
MW-E	MW-E-VAS-112-117	11/06/18	112 - 117	3000	3100
MW-E	MW-E-VAS-137-142	11/07/18	137 - 142	7900	7300
MW-E	MW-E-70-121418	12/14/18	WD, 70	-	3000
MW-E	MW-E-142-121418	12/14/18	WD, 142	4500	4200
MW-F	MW-F-VAS-52-57	01/06/19	52 - 57	2700	2500
MW-F	MW-F-VAS-82-87	01/07/19	82 - 87	120	110
MW-F	MW-F-VAS-97-102	01/07/19	97 - 102	1900	1800
MW-F	MW-F-VAS-112-117	01/08/19	112 - 117	790	740
MW-F	MW-F-104-022719	02/27/19	WD, 104	1800	1700
MW-F	MW-F-60-022819	02/28/19	WD, 60	2300	2200
MW-G	MW-G-VAS-52-57	02/13/19	52 - 57	790	680
MW-G	MW-G-VAS-67-72	02/14/19	67 - 72	1000	920
MW-G	MW-G-VAS-77-82	02/15/19	77 - 82	710	600
MW-G	MW-G-82-030219	03/02/19	WD, 82	1500	1500
MW-G	MW-G-57-030219	03/02/19	WD, 57	510	560
MW-L	MW-L-VAS-76-81	10/06/18	76 - 81	34	31
MW-L	MW-L-VAS-106-111	10/09/18	106 - 111	0.697 J	0.84

Table B-1. Groundwater Sampling Results for April 2019

April 2019 Monthly Progress Report for the Final Groundwater Remedy Construction and Startup
PG&E Topock Compressor Station, Needles, California

Location	Sample ID	Sample Date	Depth Interval (ft bgs)	Total Dissolved Chromium (µg/L)	Hexavalent Chromium (µg/L)
MW-L	MW-L-VAS-141-146	10/10/18	141 - 146	< 0.13 U	< 0.033 U
MW-L	MW-L-VAS-181-186	10/20/18	181 - 186	3.8	3.3
MW-L	MW-L-VAS-218-223	10/21/18	218 - 223	68	66
MW-L	MW-L-VAS-261-266	10/22/18	261 - 266	0.284 J	< 0.17 U
MW-L	MW-L-180-032819	03/28/19	WD, 180	< 0.13 U	< 0.17 U
MW-L	MW-L-245-030319	03/03/19	WD, 245	14	15
MW-L	MW-L-90-032919	03/29/19	WD, 90	19	18
MW-L	MW-L-225-032919	03/29/19	WD, 225	410	380
MW-M	MW-M-VAS-52-57	03/28/19	52 - 57	29	28
MW-M	MW-M-VAS-72-77	03/29/19	72 - 77	< 0.13 U	< 0.033 U
MW-M	MW-M-VAS-107-112	03/30/19	107 - 112	< 0.13 U	< 0.033 U
MW-M	MW-M-VAS-147-152	03/31/19	147 - 152	Data not yet available	< 0.17 U
MW-M	MW-M-VAS-172-177	04/02/19	172 - 177	< 0.13 U	< 0.033 U
MW-M	MW-M-VAS-190-195	04/10/19	190 - 195	< 0.13 U	< 0.17 U
MW-N	MW-N-VAS-121-126	02/14/19	121 - 126	0.699 J	0.51
MW-N	MW-N-VAS-142-147	02/16/19	142 - 147	< 0.13 U	< 0.033 U
MW-N	MW-N-VAS-173-178	02/18/19	173 - 178	< 0.13 U	< 0.033 U
MW-N	MW-N-VAS-210-215	02/21/19	210 - 215	320	290
MW-N	MW-N-VAS-228-233	02/26/19	228 - 233	< 0.13 U	< 0.17 U
MW-N	MW-N-217-040219	04/02/19	WD, 217	110	110
MW-N	MW-N-237-040119	04/01/19	WD, 237	1600	1500
MW-N	MW-N-129-040319	04/03/19	WD, 129	45	46
MW-W	MW-W-VAS-7-12	03/27/19	7 - 12	0.266 J	< 0.17 U
MW-W	MW-W-VAS-22-27	03/28/19	22 - 27	< 0.13 U	< 0.33 U
MW-W	MW-W-31-040419	04/04/19	WD, 31	< 0.13 U	< 0.17 U
MW-U	MW-U-VAS-137-142	04/12/19	137 - 142	0.818 J	1.4
MW-U	MW-U-VAS-181-186	04/13/19	181 - 186	< 0.13 U	0.112 J
MW-U	MW-U-VAS-222-227	04/14/19	222 - 227	< 0.13 U	< 0.033 U
MW-U	MW-U-VAS-257-262	04/16/19	257 - 262	Data not yet available	0.0896 J
MW-U	MW-U-VAS-287-292	04/17/19	287 - 292	Data not yet available	< 0.033 U
MW-U	MW-U-VAS-317-322	04/24/19	317 - 322	Data not yet available	< 0.17 U
IRZ-9	IRZ-9-VAS-27-32	12/03/18	27 -32	120	120
IRZ-9	IRZ-9-VAS-47-52	12/04/18	47 -52	< 0.13 U	< 0.033 U
IRZ-9	IRZ-9-VAS-62-67	12/04/18	62 -67	< 0.13 U	< 0.033 U
IRZ-9	IRZ-9-VAS-182-187	12/11/18	182 -187	< 0.13 U	< 0.17 U
IRZ-9	IRZ-9-VAS-207-212	12/13/18	207 -212	< 0.13 U	< 0.17 U
IRZ-9	IRZ-9-VAS-232-237	12/13/18	232 -237	0.811 J	< 0.17 U

Table B-1. Groundwater Sampling Results for April 2019

April 2019 Monthly Progress Report for the Final Groundwater Remedy Construction and Startup
PG&E Topock Compressor Station, Needles, California

Location	Sample ID	Sample Date	Depth Interval (ft bgs)	Total Dissolved Chromium (µg/L)	Hexavalent Chromium (µg/L)
IRZ-9	IRZ-9-VAS-264-269	12/15/18	264 -269	< 0.13 U	< 0.17 U
IRZ-9	IRZ-9-VAS-276-281	12/16/18	276 -281	< 0.13 U	< 0.17 U
IRZ-9	IRZ-9-VAS-292-297	12/18/18	292 -297	< 0.13 U	< 0.17 U
IRZ-13	IRZ-13-VAS-32-37	11/17/18	32 - 37	170	220
IRZ-13	IRZ-13-VAS-57-62	11/18/18	57 - 62	< 0.13 U	< 0.17 U
IRZ-13	IRZ-13-VAS-102-107	11/19/18	102 - 107	< 0.13 U	< 0.17 U
IRZ-13	IRZ-13-VAS-142-147	11/19/18	142 - 147	< 0.13 U	< 0.17 U
IRZ-13	IRZ-13-VAS-180-185	11/27/18	180 - 185	230	190
IRZ-13	IRZ-13-VAS-197-202	11/28/18	197 - 202	< 0.13	< 0.83
IRZ-13	IRZ-13-VAS-224-229	11/28/18	224 - 229	< 0.13	< 0.83
IRZ-13	IRZ-13-VAS-237-242	11/29/18	237 - 242	< 0.13 U	< 0.17 U
IRZ-15	IRZ-15-VAS-32-37	11/01/18	32 - 37	13	13
IRZ-15	IRZ-15-VAS-62-67	11/02/18	62 - 67	< 0.65 U	0.459 J
IRZ-15	IRZ-15-VAS-102-107	11/03/18	102 - 107	< 0.65 U	< 0.17 U
IRZ-15	IRZ-15-VAS-132-137	11/04/18	132 - 137	0.228 J	< 0.17 U
IRZ-15	IRZ-15-VAS-162-167	11/05/18	162 - 167	3400	3200
IRZ-15	IRZ-15-VAS-182-187	11/06/18	182 - 187	130	140
IRZ-15	IRZ-15-VAS-222-227	11/07/18	222 - 227	< 0.13 U	< 0.17 U
IRZ-16	IRZ-16-VAS-27-32	02/20/19	27 - 32	480	480
IRZ-16	IRZ-16-VAS-57-62	02/20/19	57 - 62	< 0.33 U	< 0.33 U
IRZ-16	IRZ-16-VAS-102-107	02/21/19	102 - 107	< 0.33 U	< 0.33 U
IRZ-16	IRZ-16-VAS-132-137	02/26/19	132 - 137	< 0.17 U	< 0.17 U
IRZ-16	IRZ-16-VAS-147-152	02/27/19	147 - 152	< 0.17 U	< 0.17 U
IRZ-16	IRZ-16-VAS-172-177	02/27/19	172 - 177	110	110
IRZ-16	IRZ-16-VAS-192-197	02/28/19	192 - 197	< 0.17 U	< 0.17 U
IRZ-17	IRZ-17-VAS-32-37	03/02/19	32 - 37	78	67
IRZ-17	IRZ-17-VAS-62-67	03/02/19	62 - 67	0.750 J	0.604 J
IRZ-17	IRZ-17-VAS-102-107	03/03/19	102 - 107	< 0.13 U	< 0.17 U
IRZ-17	IRZ-17-VAS-132-137	03/13/19	132 - 137	< 0.13 U	< 0.17 U
IRZ-17	IRZ-17-VAS-137-142	03/12/19	137 - 142	< 0.13 U	< 0.13 U
IRZ-17	IRZ-17-VAS-142-147	03/04/19	142 - 147	68	84
IRZ-17	IRZ-17-VAS-147-152	03/12/19	147 - 152	< 0.13 U	< 0.33 U
IRZ-17	IRZ-17-VAS-152-157	03/04/19	152 - 157	16	7.0
IRZ-17	IRZ-17-VAS-162-167	03/04/19	162 - 167	< 0.13 U	< 0.17 U
IRZ-17	IRZ-17-VAS-172-177	03/05/19	172 - 177	< 0.13 U	< 0.17 U
IRZ-20	IRZ-17-VAS-197-202	03/06/19	197 - 202	< 0.13 U	< 0.17 U
IRZ-20	IRZ-17-VAS-217-222	03/06/19	217 - 222	< 0.13 U	< 0.17 U

Table B-1. Groundwater Sampling Results for April 2019

April 2019 Monthly Progress Report for the Final Groundwater Remedy Construction and Startup
PG&E Topock Compressor Station, Needles, California

Location	Sample ID	Sample Date	Depth Interval (ft bgs)	Total Dissolved Chromium (µg/L)	Hexavalent Chromium (µg/L)
IRZ-20	IRZ-20-VAS-112-117	10/22/18	112 - 117	< 0.13 U	< 0.17 U
IRZ-20	IRZ-20-VAS-131-136	10/23/18	131 - 136	< 0.13 U	< 0.17 U
IRZ-20	IRZ-20-VAS-173-178	10/24/18	173 - 178	< 0.13 U	< 0.83 U
IRZ-21	IRZ-21-VAS-52-57	12/15/18	52 - 57	100	97
IRZ-21	IRZ-21-VAS-77-82	12/16/18	77 - 82	1.3	1.1
IRZ-21	IRZ-21-VAS-112-117	12/16/18	112 - 117	< 0.13 U	< 0.17 U
IRZ-21	IRZ-21-VAS-132-137	12/17/18	132 - 137	< 0.13 U	< 0.17 U
IRZ-21	IRZ-21-VAS-147-152	12/18/18	147 - 152	4000	3600
IRZ-23	IRZ-23-VAS-67-72	12/01/18	67 - 72	86	85
IRZ-23	IRZ-23-VAS-92-97	12/01/18	92 - 97	0.453 J	< 0.033 U
IRZ-23	IRZ-23-VAS-122-127	12/02/18	122 - 127	2100	2000
IRZ-23	IRZ-23-VAS-139-144	12/02/18	139 - 144	3400	3000
IRZ-25	IRZ-25-VAS-52-57	12/05/18	52 - 57	4300	3500
IRZ-25	IRZ-25-VAS-67-72	12/05/18	67 - 72	750	620
IRZ-25	IRZ-25-VAS-92-97	12/06/18	92 - 97	140	130
IRZ-25	IRZ-25-VAS-112-117	12/11/18	112 - 117	< 0.13 U	< 0.17 U
IRZ-25	IRZ-25-VAS-147-152	12/11/18	147 - 152	3800	3600
IRZ-25	IRZ-25-VAS-162-167	12/13/18	162 - 167	3000	3000
IRZ-27	IRZ-27-VAS-52-57	03/15/19	52 - 57	4500	4400
IRZ-27	IRZ-27-VAS-72-77	03/17/19	72 - 77	0.338 J	< 0.033 U
IRZ-27	IRZ-27-VAS-102-107	03/18/19	102 - 107	< 0.13 U	< 0.17 U
IRZ-27	IRZ-27-VAS-132-137	03/20/19	132 - 137	1200	1300
IRZ-39	IRZ-39-VAS-27-32	03/30/19	27 - 32	31	29
RB-3	RB-3-VAS-15-20	04/26/19	15 - 20	Data not yet available	< 0.033 U
RB-3	RB-3-VAS-50-55	04/27/19	50 - 55	Data not yet available	0.100 J
RB-3	RB-3-VAS-80-85	04/27/19	80 - 85	Data not yet available	0.132 J
RB-3	RB-3-VAS-120-125	04/28/19	120 - 125	Data not yet available	< 0.17 U
RB-3	RB-3-VAS-150-155	04/29/19	150 - 155	Data not yet available	< 0.17 U
RB-3	RB-3-VAS-180-185	04/29/19	180 - 185	Data not yet available	< 0.033 U
RB-3	RB-3-VAS-205-210	04/30/19	205 - 210	Data not yet available	< 0.17 U
RB-4	RB-4-VAS-15-20	04/12/19	15 - 20	< 0.13 U	0.0556 J
RB-4	RB-4-VAS-41-46	04/12/19	41 - 46	< 0.13 U	< 0.033 U
RB-4	RB-4-VAS-81-86	04/12/19	81 - 86	< 0.13 U	< 0.033 U
RB-4	RB-4-VAS-121-126	04/13/19	121 - 126	< 0.13 U	< 0.033 U
RB-4	RB-4-VAS-136-141	04/13/19	136 - 141	< 0.13 U	< 0.17 U
RB-4	RB-4-VAS-155-160	04/17/19	155 - 160	Data not yet available	< 0.17 U
RB-5	RB-5-VAS-12-17	04/04/19	12 - 17	0.235 J	0.125 J

Table B-1. Groundwater Sampling Results for April 2019

April 2019 Monthly Progress Report for the Final Groundwater Remedy Construction and Startup
PG&E Topock Compressor Station, Needles, California

Location	Sample ID	Sample Date	Depth Interval (ft bgs)	Total Dissolved Chromium (µg/L)	Hexavalent Chromium (µg/L)
RB-5	RB-5-VAS-42-47	04/09/19	42 - 47	< 0.13 U	< 0.033 U
RB-5	RB-5-VAS-82-87	04/09/19	82 - 87	0.769 J	0.127 J

Notes:
µg/L = micrograms per liter
ft bgs = feet below ground surface
J = The analyte was positively identified; however, the associated numerical value is an estimated concentration only
U = The analyte was analyzed for but not detected at the analyte method detection limit indicated
VAS = vertical aquifer sampling
WD = sample from well development, depth noted is from bottom of screen

ARCADIS Design & Consultancy for natural and built assets

Boring Log

Boring No.: MW-Bd

Date Started:	01/05/2019	Surface Elevation:	N/A		
Date Completed:	02/28/2019	Northing (NAD83):	N/A		
Drilling Co.:	Cascade	Easting (NAD83):	N/A	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	357 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Fullsize Track Mount	Borehole Diameter:	6 inches	Location:	PG&E Topock, Needles, California
Driller Name:	Nick Petrone	Depth to First Water:	21 ft bgs		
Drilling Asst:	T. Alymer/ J. Candelaria	Sampling Method:	10 ft Core Barrel	Project Number:	RC000753.0051
Logger:	G. Willford / C. Bonessi	Sampling Interval:	Continuous		
Editor:	Sean McGrane	Converted to Well:	☒ Yes ☐ No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
1–7	39.6			Topock - Fill	SM		(0.0 - 12.0') Topock - Fill; Poorly graded sand with silt (SM); very pale brown (10YR 8/3); very fine grained to fine grained, angular to subround; little silt; dry; trace organics	(0.0 - 7.0') Soft drilling	(0.0 - 297.0') No water used
7–12	120			Topock - Fill	GM		(12.0 - 13.5') Topock - Fill; Silty gravel with sand (GM); (GLEY1 4/1); medium pebbles to very large pebbles, angular; some silt; little medium to very coarse grained sand, angular; dry; 1.5" Meta-Diorite Boulder		
12–17				Topock - Fluvial Deposits	GM		(13.5 - 17.0') Topock - Fluvial Deposits; Silty gravel with sand (GM); dark olive brown (2.5Y 3/3); granules to very large pebbles, angular to round; some very fine to very coarse grained sand, angular to subround; some silt; trace cobbles, angular to subround; dry; gravel composed of mixed lithology		
17–20	108			Topock - Fluvial Deposits	GM		(17.0 - 21.5') Topock - Fluvial Deposits; Silty gravel with sand (GM); dark grayish brown / dark yellowish brown(10YR 4/2); granules to very large pebbles, angular to subround; some very fine to very coarse grained sand, angular to subround; some silt; little clay; dry		

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater

Remarks: U = not detected above the laboratory reporting limit, ppb = parts per billion

ARCADIS Design & Consultancy for natural and built assets

Boring Log

Boring No.: MW-Bd

Date Started:	01/05/2019	Surface Elevation:	N/A		
Date Completed:	02/28/2019	Northing (NAD83):	N/A		
Drilling Co.:	Cascade	Easting (NAD83):	N/A	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	357 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Fullsize Track Mount	Borehole Diameter:	6 inches	Location:	PG&E Topock, Needles, California
Driller Name:	Nick Petrone	Depth to First Water:	21 ft bgs		
Drilling Asst:	T. Alymer/ J. Candelaria	Sampling Method:	10 ft Core Barrel	Project Number:	RC000753.0051
Logger:	G. Willford / C. Bonessi	Sampling Interval:	Continuous		
Editor:	Sean McGrane	Converted to Well:	☒ Yes ☐ No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
21				Topock - Fluvial Deposits	GM			(21.0') Approximate depth to water table	(0.0 - 297.0') No water used
22				Topock - Fluvial Deposits	SC		(21.5 - 22.5') Topock - Fluvial Deposits; Clayey sand with gravel (SC); reddish yellow (7.5YR 6/6); very fine grained to very coarse grained, angular to subround; some granules to very large pebbles, subangular to subround; little silt; little clay; moist; gravel composed of mixed lithology		
23				Topock - Alluvium Deposits	CH		(22.5 - 24.0') Topock - Alluvium Deposits; Fat clay with gravel (CH); reddish yellow (5YR 6/8); high plasticity; little cobbles, subangular to subround; trace very fine grained sand, subangular to subround; trace silt; moist		
24	108								
25				Topock - Alluvium Deposits	SM		(24.0 - 27.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); brown (7.5YR 5/3); fine grained to very coarse grained, angular to subround; some silt; little granules to medium pebbles, angular to subround; little clay; moist		
26									
27									
28				Topock - Alluvium Deposits	SM		(27.0 - 32.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); brown (7.5YR 5/3); very fine grained to very coarse grained, angular to round; some granules to large pebbles, angular to subround; some silt; little clay; moist		
29			MW-B-VAS-27-32 (7.7 J ppb) 1/6/2019 12:50:17 PM						
30	60								
31									
32									
33				Topock - Alluvium Deposits	SC		(32.0 - 33.0') Topock - Alluvium Deposits; Clayey sand with gravel (SC); light brown (7.5YR 6/4); fine grained to very coarse grained, angular to round; some clay; little granules to medium pebbles, angular to subround; little silt; wet; gravel composed of mixed litholgy		
34				Topock - Alluvium Deposits	SM		(33.0 - 44.5') Topock - Alluvium Deposits; Silty sand with gravel (SM); brown (7.5YR 5/3); very fine grained to very coarse grained, angular to round; little granules to medium pebbles, angular to subround; little silt; little clay; trace cobbles, subangular; wet		
35									
36	120								
37									
38									
39									
40									

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Remarks: U = not detected above the laboratory reporting limit, ppb = parts per billion

Boring Log

ARCADIS Design & Consultancy for natural and built assets

Date Started:	01/05/2019	Surface Elevation:	N/A	**Boring No.:**	**MW-Bd**
Date Completed:	02/28/2019	Northing (NAD83):	N/A		
Drilling Co.:	Cascade	Easting (NAD83):	N/A	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	357 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Fullsize Track Mount	Borehole Diameter:	6 inches	Location:	PG&E Topock, Needles, California
Driller Name:	Nick Petrone	Depth to First Water:	21 ft bgs		
Drilling Asst:	T. Alymer/ J. Candelaria	Sampling Method:	10 ft Core Barrel	Project Number:	RC000753.0051
Logger:	G. Willford / C. Bonessi	Sampling Interval:	Continuous		
Editor:	Sean McGrane	Converted to Well:	☒ Yes ☐ No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
41	120			Topock - Alluvium Deposits	SM				(0.0 - 297.0') No water used
42									
43									
44									
45				Topock - Alluvium Deposits	SM		(44.5 - 52.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); brown (7.5YR 5/3) little grayish brown (10YR 5/2); very fine grained to very coarse grained, angular to round; little granules to very large pebbles, angular to subround; little cobbles, subangular to subround; little silt; little clay; wet		
46									
47	120		MW-B-VAS-47-52 (<0.17 U ppb) 1/9/2019 10:15:46 AM						
48									
49									
50									
51									
52				Topock - Alluvium Deposits	SM		(52.0 - 62.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); brown (7.5YR 4/4); very fine grained to very fine grained, angular to round; some silt; little granules to very large pebbles, angular to round; little clay; trace cobbles, subangular to subround; moist to wet		
53									
54									
55									
56	120								
57									
58									
59									
60									

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Remarks: U = not detected above the laboratory reporting limit, ppb = parts per billion

Date Started:	01/05/2019	Surface Elevation:	N/A	**Boring No.:**	**MW-Bd**
Date Completed:	02/28/2019	Northing (NAD83):	N/A		
Drilling Co.:	Cascade	Easting (NAD83):	N/A	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	357 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Fullsize Track Mount	Borehole Diameter:	6 inches	Location:	PG&E Topock, Needles, California
Driller Name:	Nick Petrone	Depth to First Water:	21 ft bgs		
Drilling Asst:	T. Alymer/ J. Candelaria	Sampling Method:	10 ft Core Barrel	Project Number:	RC000753.0051
Logger:	G. Willford / C. Bonessi	Sampling Interval:	Continuous		
Editor:	Sean McGrane	Converted to Well:	☒ Yes ☐ No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
61	120			Topock - Alluvium Deposits	SM				(0.0 - 297.0') No water used
62				Topock - Alluvium Deposits	ML		(62.0 - 64.5') Topock - Alluvium Deposits; Sandy silt with gravel (ML); brown (7.5YR 4/3); medium plasticity; some very fine to medium grained sand, angular to round; little granules to medium pebbles, angular to subround; little clay; moist		
63									
64									
65				Topock - Fluvial Deposits	GM		(64.5 - 65.5') Topock - Fluvial Deposits; Silty gravel with sand (GM); brown (7.5YR 4/4); granules to very large pebbles, angular to subround; some very fine to very coarse grained sand, angular to round; some silt; little cobbles, subangular to subround; trace clay; moist		
66				Topock - Alluvium Deposits	SM		(65.5 - 72.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); brown (7.5YR 4/4); very fine grained to very coarse grained; some silt; little granules to very large pebbles, angular to subround; little cobbles, subangular to subround; trace clay; moist to wet		
67	120								
68									
69			MW-B-VAS-67-72 (<0.17 U ppb) 1/9/2019 2:55:27 PM						
70									
71									
72				Topock - Alluvium Deposits	GM		(72.0 - 77.0') Topock - Alluvium Deposits; Silty gravel with sand (GM); light brown (7.5YR 6/4); granules to very large pebbles, angular to round; some very fine to very coarse grained sand, angular to round; some silt; trace clay; moist to wet		
73									
74									
75									
76	120								
77									
78				Topock - Alluvium Deposits	SM		(77.0 - 88.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); strong brown (7.5YR 5/6); very fine grained to very coarse grained, angular to round; little small to medium pebbles, angular to subround; little silt; trace clay; wet; majority of pebbles are elongated. Gravel composed of mixed lithology.		
79									
80									

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Remarks: U = not detected above the laboratory reporting limit, ppb = parts per billion

Boring Log

ARCADIS Design & Consultancy for natural and built assets

Date Started:	01/05/2019	Surface Elevation:	N/A	**Boring No.:**	**MW-Bd**
Date Completed:	02/28/2019	Northing (NAD83):	N/A		
Drilling Co.:	Cascade	Easting (NAD83):	N/A	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	357 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Fullsize Track Mount	Borehole Diameter:	6 inches	Location:	PG&E Topock, Needles, California
Driller Name:	Nick Petrone	Depth to First Water:	21 ft bgs		
Drilling Asst:	T. Alymer/ J. Candelaria	Sampling Method:	10 ft Core Barrel	Project Number:	RC000753.0051
Logger:	G. Willford / C. Bonessi	Sampling Interval:	Continuous		
Editor:	Sean McGrane	Converted to Well:	☒ Yes ☐ No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
81	120			Topock - Alluvium Deposits	SM				(0.0 - 297.0') No water used
82									
83									
84									
85									
86									
87	120								
88									
89				Topock - Alluvium Deposits	GM		(88.0 - 91.0') Topock - Alluvium Deposits; Silty gravel with sand (GM); brown (7.5YR 4/3); granules to small cobbles, angular to subround; some very fine to very coarse grained sand, angular to round; some silt; trace clay; moist; gravel composed mostly of meta-diorite		
90									
91									
92				Topock - Alluvium Deposits	SM		(91.0 - 97.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); strong brown (7.5YR 4/6); very fine grained to very coarse grained, angular to round; some granules to very large pebbles, angular to subround; some silt; trace cobbles, angular to subangular; trace clay; wet; gravel composed of mixed lithology		
93									
94									
95	60								
96									
97									
98	120			Topock - Alluvium Deposits	ML		(97.0 - 102.0') Topock - Alluvium Deposits; Sandy silt with gravel (ML); strong brown (7.5YR 5/6) trace red (10R 5/8); medium plasticity; some very fine to very coarse grained sand, subangular to round; little granules to medium pebbles, subangular to subround; trace clay; moist; iron oxide staining		
99									
100									

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater

Remarks: U = not detected above the laboratory reporting limit, ppb = parts per billion

ARCADIS Design & Consultancy for natural and built assets

Boring Log

Date Started:	01/05/2019	Surface Elevation:	N/A	**Boring No.:**	**MW-Bd**
Date Completed:	02/28/2019	Northing (NAD83):	N/A		
Drilling Co.:	Cascade	Easting (NAD83):	N/A	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	357 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Fullsize Track Mount	Borehole Diameter:	6 inches	Location:	PG&E Topock, Needles, California
Driller Name:	Nick Petrone	Depth to First Water:	21 ft bgs		
Drilling Asst:	T. Alymer/ J. Candelaria	Sampling Method:	10 ft Core Barrel	Project Number:	RC000753.0051
Logger:	G. Willford / C. Bonessi	Sampling Interval:	Continuous		
Editor:	Sean McGrane	Converted to Well:	☒ Yes ☐ No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
101				Topock - Alluvium Deposits	ML				(0.0 - 297.0') No water used
102									
103	120		MW-B-VAS-102-107 (<0.17 U ppb) 1/10/2019 1:15:17 PM	Topock - Alluvium Deposits	SM		(102.0 - 107.0') Topock - Alluvium Deposits; Silty sand (SM); strong brown (7.5YR 5/6); very fine grained to very coarse grained, subangular to subround; some silt; little granules to medium pebbles, subangular to subround; trace clay; wet		
104									
105									
106									
107									
108				Topock - Alluvium Deposits	SM		(107.0 - 122.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); strong brown (7.5YR 5/6); very fine grained to very coarse grained, angular to subround; some granules to very large pebbles, angular to subround; some silt; trace cobbles, subangular; trace clay; moist to wet		
109									
110									
111									
112	120								
113									
114									
115									
116									
117									
118									
119	120								
120									

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater

Remarks: U = not detected above the laboratory reporting limit, ppb = parts per billion

ARCADIS Design & Consultancy for natural and built assets

Boring Log

Boring No.: MW-Bd

Date Started:	01/05/2019	Surface Elevation:	N/A		
Date Completed:	02/28/2019	Northing (NAD83):	N/A		
Drilling Co.:	Cascade	Easting (NAD83):	N/A	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	357 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Fullsize Track Mount	Borehole Diameter:	6 inches	Location:	PG&E Topock, Needles, California
Driller Name:	Nick Petrone	Depth to First Water:	21 ft bgs		
Drilling Asst:	T. Alymer/ J. Candelaria	Sampling Method:	10 ft Core Barrel	Project Number:	RC000753.0051
Logger:	G. Willford / C. Bonessi	Sampling Interval:	Continuous		
Editor:	Sean McGrane	Converted to Well:	☒ Yes ☐ No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
121				Topock - Alluvium Deposits	SM				(0.0 - 297.0') No water used
122									
123	120			Topock - Alluvium Deposits	GM		(122.0 - 126.0') Topock - Alluvium Deposits; Silty gravel with sand (GM); strong brown (7.5YR 5/6) trace very dark gray (7.5YR 3/1); granules to very large pebbles, angular to subround; some very fine to very coarse grained sand, angular to subround; some silt; little cobbles, subangular to subround; trace clay; moist		
124									
125									
126									
127				Topock - Alluvium Deposits	SM		(126.0 - 129.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); strong brown (7.5YR 5/6); very fine grained to very coarse grained, angular to subround; some granules to very large pebbles, angular to subround; some silt; trace cobbles, subangular; trace clay; moist to wet		
128									
129									
130	120			Topock - Alluvium Deposits	GM		(129.0 - 134.0') Topock - Alluvium Deposits; Silty gravel with sand (GM); strong brown (7.5YR 5/6) some very dark gray (10YR 3/1); granules to very large pebbles, angular to subangular; some very fine to very coarse grained sand, angular to subround; some silt; trace cobbles, angular; trace clay; moist; moderate cementation		
131									
132									
133									
134									
135				Topock - Alluvium Deposits	SM		(134.0 - 144.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); strong brown (7.5YR 5/6); very fine grained to very coarse grained, angular to round; some silt; little granules to medium pebbles, subangular to subround; trace cobbles, subangular; trace clay; moist		
136									
137									
138	120								
139									
140									

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater

Remarks: U = not detected above the laboratory reporting limit, ppb = parts per billion

ARCADIS Design & Consultancy for natural and built assets

Boring Log

Date Started:	01/05/2019	Surface Elevation:	N/A	**Boring No.:**	**MW-Bd**
Date Completed:	02/28/2019	Northing (NAD83):	N/A		
Drilling Co.:	Cascade	Easting (NAD83):	N/A	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	357 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Fullsize Track Mount	Borehole Diameter:	6 inches	Location:	PG&E Topock, Needles, California
Driller Name:	Nick Petrone	Depth to First Water:	21 ft bgs		
Drilling Asst:	T. Alymer/ J. Candelaria	Sampling Method:	10 ft Core Barrel	Project Number:	RC000753.0051
Logger:	G. Willford / C. Bonessi	Sampling Interval:	Continuous		
Editor:	Sean McGrane	Converted to Well:	☒ Yes ☐ No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
141				Topock - Alluvium Deposits	SM				(0.0 - 297.0') No water used
142									
143									
144	120		MW-B-VAS-142-147 (<0.17 U ppb) 1/15/2019 2:25:50 PM						
145				Topock - Alluvium Deposits	SM		(144.0 - 147.0') Topock - Alluvium Deposits; Silty sand (SM); brown (7.5YR 5/4); very fine grained to very coarse grained, angular to subround; some silt; little granules to medium pebbles, subangular to round; trace clay; moist to wet		
146									
147									
148				Topock - Alluvium Deposits	SM		(147.0 - 152.5') Topock - Alluvium Deposits; Silty sand with gravel (SM); light brown (7.5YR 6/4)(4); very fine grained to very coarse grained, angular to subround; some silt; little granules to large pebbles, subangular to round; trace clay; moist to wet		
149									
150									
151									
152	120								
153				Topock - Alluvium Deposits	GM		(152.5 - 154.0') Topock - Alluvium Deposits; Silty sand with gravel (GM); light brown (7.5YR 6/4); granules to very large pebbles; some very fine to very coarse grained sand, angular to subround; some silt; trace clay; moist		
154				Topock - Alluvium Deposits	SM		(154.0 - 157.0') Topock - Alluvium Deposits; Silty sand (SM); brown (7.5YR 5/4); very fine grained to very coarse grained, angular to subround; some silt; little granules to medium pebbles, subangular to round; trace clay; wet		
155									
156									
157									
158	120			Topock - Alluvium Deposits	GM		(157.0 - 160.0') Topock - Alluvium Deposits; Silty gravel with sand (GM); dark brown (10YR 3/3) little reddish brown (2.5YR 4/4); granules to small cobbles, subangular to subround; some very fine to very coarse grained sand, angular to subround; little silt; little clay; moist		
159									
160									

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Boring Log

ARCADIS Design & Consultancy for natural and built assets

Boring No.: MW-Bd

Date Started:	01/05/2019	Surface Elevation:	N/A		
Date Completed:	02/28/2019	Northing (NAD83):	N/A		
Drilling Co.:	Cascade	Easting (NAD83):	N/A	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	357 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Fullsize Track Mount	Borehole Diameter:	6 inches	Location:	PG&E Topock, Needles, California
Driller Name:	Nick Petrone	Depth to First Water:	21 ft bgs		
Drilling Asst:	T. Alymer/ J. Candelaria	Sampling Method:	10 ft Core Barrel	Project Number:	RC000753.0051
Logger:	G. Willford / C. Bonessi	Sampling Interval:	Continuous		
Editor:	Sean McGrane	Converted to Well:	☒ Yes ☐ No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
161									(0.0 - 297.0') No water used
162									
163									
	120			Topock - Alluvium Deposits	SM		(160.0 - 167.0') Topock - Alluvium Deposits; Silty sand (SM); brown (7.5YR 5/4); very fine grained to very coarse grained, angular to subround; some silt; little granules to medium pebbles, subangular to round; trace clay; wet		
164									
165									
166									
167									
168				Topock - Alluvium Deposits	GP		(167.0 - 168.0') Topock - Alluvium Deposits; Poorly graded gravel (GP); (GLEY2 6/1); small cobbles to large cobbles, angular; trace very fine to medium grained sand, angular to subangular; trace silt; dry; pulverized metadiorite boulder		
169				Topock - Alluvium Deposits	ML		(168.0 - 173.0') Topock - Alluvium Deposits; Sandy silt with gravel (ML); reddish brown / moderate brown(5YR 4/4); medium plasticity; some very fine to coarse grained sand; little granules to small pebbles, subangular to subround; little clay; moist to wet		
170									
171									
172	120								
173									
174				Topock - Alluvium Deposits	SM		(173.0 - 183.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); reddish brown / moderate brown(5YR 4/4); very fine grained to very coarse grained, angular to subround; some granules to large pebbles, angular to subround; some silt; trace clay; wet		
175									
176									
177									
178									
	120								
179									
180									

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Boring Log

ARCADIS Design & Consultancy for natural and built assets

Boring No.: MW-Bd

Date Started:	01/05/2019	Surface Elevation:	N/A	Client:	PG&E
Date Completed:	02/28/2019	Northing (NAD83):	N/A		
Drilling Co.:	Cascade	Easting (NAD83):	N/A	Project:	Final GW Remedy Phase 1
Drilling Method:	Sonic Drilling	Total Depth:	357 ft bgs	Location:	PG&E Topock, Needles, California
Drill Rig Type:	Fullsize Track Mount	Borehole Diameter:	6 inches		
Driller Name:	Nick Petrone	Depth to First Water:	21 ft bgs		
Drilling Asst:	T. Alymer/ J. Candelaria	Sampling Method:	10 ft Core Barrel	Project Number:	RC000753.0051
Logger:	G. Willford / C. Bonessi	Sampling Interval:	Continuous		
Editor:	Sean McGrane	Converted to Well:	☒ Yes ☐ No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
181				Topock - Alluvium Deposits	SM				(0.0 - 297.0') No water used
182									
183									
184	120		MW-B-VAS-182-187 (<0.17 U ppb) 2/13/2019 10:30:35 AM	Topock - Alluvium Deposits	SM		(183.0 - 187.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); grayish brown (10YR 5/2) trace red (2.5YR 4/6); very fine grained to very coarse grained, angular to subround; some granules to large pebbles, angular to subround; some silt; trace clay; moist to wet		
185									
186									
187									
188				Topock - Alluvium Deposits	SM		(187.0 - 192.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); yellowish red / light brown(5YR 5/6); very fine grained to very coarse grained, angular to subround; some granules to very large pebbles, subangular to subround; little silt; trace cobbles, angular to subangular; trace clay; wet		
189									
190									
191									
192	114			Topock - Alluvium Deposits	SM		(192.0 - 195.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); brown (7.5YR 5/3); very fine grained to very coarse grained, angular to subround; some granules to very large pebbles, subangular to subround; little silt; trace cobbles, angular to subangular; trace clay; wet		
193									
194									
195				Topock - Alluvium Deposits	SM		(195.0 - 197.0') Topock - Alluvium Deposits; Silty sand (SM); light reddish brown (5YR 6/3); very fine grained to very coarse grained, angular to subround; some silt; little granules to medium pebbles, subangular to round; trace clay; moist		
196									
197									
198	60			Topock - Alluvium Deposits	SM		(197.0 - 202.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); light reddish brown / light brown(5YR 6/4); fine grained to very coarse grained, angular to subround; little granules to large pebbles, subangular to subround; little silt; trace cobbles, subangular; trace clay; moist		
199									
200									

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Boring Log

ARCADIS Design & Consultancy for natural and built assets

Date Started:	01/05/2019	Surface Elevation:	N/A	**Boring No.:**	**MW-Bd**
Date Completed:	02/28/2019	Northing (NAD83):	N/A		
Drilling Co.:	Cascade	Easting (NAD83):	N/A	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	357 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Fullsize Track Mount	Borehole Diameter:	6 inches	Location:	PG&E Topock, Needles, California
Driller Name:	Nick Petrone	Depth to First Water:	21 ft bgs		
Drilling Asst:	T. Alymer/ J. Candelaria	Sampling Method:	10 ft Core Barrel	Project Number:	RC000753.0051
Logger:	G. Willford / C. Bonessi	Sampling Interval:	Continuous		
Editor:	Sean McGrane	Converted to Well:	☒ Yes ☐ No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
201	60			Topock - Alluvium Deposits	SM				(0.0 - 297.0') No water used
202									
203	60				NR		(202.0 - 207.0') (NR)	(202.0 - 207.0') No Core Recovery. Driller noted core barrel was full during core extraction.	
204									
205									
206									
207									
208				Topock - Alluvium Deposits	SM		(207.0 - 215.0') Topock - Alluvium Deposits; Silty sand (SM); light reddish brown (5YR 6/3); very fine grained to very coarse grained, angular to subround; some silt; little granules to medium pebbles, subangular to round; trace clay; wet		
209			MW-B-VAS-207-212 (<0.17 U ppb) 2/14/2019 10:55:55 AM						
210									
211									
212									
213	60								
214									
215									
216				Topock - Alluvium Deposits	SM		(215.0 - 220.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); yellowish red / light brown(5YR 5/6); very fine grained to very coarse grained, angular to subround; some silt; little granules to medium pebbles, angular to subangular; trace cobbles, angular to subangular; trace clay; moist; gravel composed of mixed lithology		
217									
218	114								
219									
220									

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Remarks: U = not detected above the laboratory reporting limit, ppb = parts per billion

ARCADIS Design & Consultancy for natural and built assets

Boring Log

Boring No.: MW-Bd

Date Started:	01/05/2019	Surface Elevation:	N/A		
Date Completed:	02/28/2019	Northing (NAD83):	N/A		
Drilling Co.:	Cascade	Easting (NAD83):	N/A	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	357 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Fullsize Track Mount	Borehole Diameter:	6 inches	Location:	PG&E Topock, Needles, California
Driller Name:	Nick Petrone	Depth to First Water:	21 ft bgs		
Drilling Asst:	T. Alymer/ J. Candelaria	Sampling Method:	10 ft Core Barrel	Project Number:	RC000753.0051
Logger:	G. Willford / C. Bonessi	Sampling Interval:	Continuous		
Editor:	Sean McGrane	Converted to Well:	☒ Yes ☐ No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
221							(220.0 - 227.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); yellowish red (5YR 4/6); fine grained to very coarse grained, angular to subround; some granules to large pebbles, angular to subround; some cobbles, angular to subangular; some silt; trace clay; moist to wet		(0.0 - 297.0') No water used
222									
223									
224	114			Topock - Alluvium Deposits	SM				
225									
226									
227									
228					NR		(227.0 - 229.0') (NR)	(227.0 - 229.0') No core recovery. Driller noted core barrel was full during core extraction.	
229									
230							(229.0 - 237.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); yellowish red (5YR 4/6); fine grained to very coarse grained, angular to subround; some silt; little granules to large pebbles, angular to subangular; trace cobbles, angular to subangular; trace clay; wet		
231									
232	96			Topock - Alluvium Deposits	SM				
233									
234									
235									
236									
237									
238							(237.0 - 242.0') Topock - Alluvium Deposits; Sandy silt with gravel (ML); reddish brown (2.5YR 4/4); low plasticity; some very fine to medium grained sand, angular to subround; little granules to medium pebbles, angular to subround; little clay; moist to dry; moderate cementation	(237.0 - 242.0') Rough drilling. End cap found in core	
239	60			Topock - Alluvium Deposits	ML				
240									

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Boring Log

ARCADIS Design & Consultancy for natural and built assets

Date Started:	01/05/2019	Surface Elevation:	N/A	**Boring No.:**	**MW-Bd**
Date Completed:	02/28/2019	Northing (NAD83):	N/A		
Drilling Co.:	Cascade	Easting (NAD83):	N/A	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	357 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Fullsize Track Mount	Borehole Diameter:	6 inches	Location:	PG&E Topock, Needles, California
Driller Name:	Nick Petrone	Depth to First Water:	21 ft bgs		
Drilling Asst:	T. Alymer/ J. Candelaria	Sampling Method:	10 ft Core Barrel	Project Number:	RC000753.0051
Logger:	G. Willford / C. Bonessi	Sampling Interval:	Continuous		
Editor:	Sean McGrane	Converted to Well:	☒ Yes ☐ No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
241	60			Topock - Alluvium Deposits	ML			(237.0 - 242.0') Rough drilling. End cap found in core	(0.0 - 297.0') No water used
242									
243	120			Topock - Alluvium Deposits	ML		(242.0 - 254.0') Topock - Alluvium Deposits; Sandy silt with gravel (ML); reddish brown (2.5YR 4/4); medium plasticity; some very fine to medium grained sand, angular to subround; little granules to large pebbles, angular to round; little clay; trace cobbles, angular to subangular; moist; weak cementation; iron oxide staining	(242.0 - 252.0') Drill rods chattering	
244									
245									
246									
247									
248									
249			MW-B-VAS-247-252 (<0.83 U ppb) 2/17/2019 11:25:00 AM						
250									
251							(251.0 - 251.2'); core slightly saturated		
252								(252.0 - 254.0') Rough drilling	
253									
254							(254.0 - 269.0') Topock - Alluvium Deposits; Sandy elastic silt with gravel (MH); reddish brown (2.5YR 4/4); high plasticity; some very fine to coarse grained sand, angular to subround; little granules to small pebbles, subangular to subround; little clay; moist		
255									
256	120			Topock - Alluvium Deposits	MH				
257									
258									
259							(258.5'); some granules to very large pebbles, subangular to subround; little clay; trace cobbles, subround; medium to high plasticity		
260									

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Remarks: U = not detected above the laboratory reporting limit, ppb = parts per billion

ARCADIS Design & Consultancy for natural and built assets

Boring Log

Boring No.: MW-Bd

Date Started:	01/05/2019	Surface Elevation:	N/A		
Date Completed:	02/28/2019	Northing (NAD83):	N/A		
Drilling Co.:	Cascade	Easting (NAD83):	N/A	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	357 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Fullsize Track Mount	Borehole Diameter:	6 inches	Location:	PG&E Topock, Needles, California
Driller Name:	Nick Petrone	Depth to First Water:	21 ft bgs		
Drilling Asst:	T. Alymer/ J. Candelaria	Sampling Method:	10 ft Core Barrel	Project Number:	RC000753.0051
Logger:	G. Willford / C. Bonessi	Sampling Interval:	Continuous		
Editor:	Sean McGrane	Converted to Well:	☒ Yes ☐ No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
261	120								(0.0 - 297.0') No water used
262									
263									
264				Topock - Alluvium Deposits	MH				
265									
266			MW-B-VAS-264-269 (<0.33 U ppb) 2/18/2019 2:00:22 PM					(266.0 - 269.0') Drill rods chattering	
267	120								
268									
269									
270				Topock - Alluvium Deposits	ML		(269.0 - 272.0') Topock - Alluvium Deposits; Gravelly silt with sand (ML); dark red (2.5YR 3/6); low plasticity; some granules to large pebbles, subangular to round; little very fine to very coarse grained sand, angular to subround; little clay; moist to dry; moderate cementation		
271							(271'); strong cementation; dry at 271-271.4		
272									
273				Topock - Alluvium Deposits	ML		(272.0 - 282.0') Topock - Alluvium Deposits; Silty sand with gravel (ML); reddish brown (2.5YR 4/4); low plasticity; some granules to very large pebbles, angular to subround; some very fine to very coarse grained sand, angular to subround; little clay; trace cobbles, subangular to subround; moist		
274									
275								(275.0 - 276.0') Drill rods chattering	
276	120								
277									
278									
279									
280									

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Remarks: U = not detected above the laboratory reporting limit, ppb = parts per billion

ARCADIS Design & Consultancy for natural and built assets

Boring Log

Date Started:	01/05/2019	Surface Elevation:	N/A	**Boring No.:**	**MW-Bd**
Date Completed:	02/28/2019	Northing (NAD83):	N/A		
Drilling Co.:	Cascade	Easting (NAD83):	N/A	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	357 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Fullsize Track Mount	Borehole Diameter:	6 inches	Location:	PG&E Topock, Needles, California
Driller Name:	Nick Petrone	Depth to First Water:	21 ft bgs		
Drilling Asst:	T. Alymer/ J. Candelaria	Sampling Method:	10 ft Core Barrel	Project Number:	RC000753.0051
Logger:	G. Willford / C. Bonessi	Sampling Interval:	Continuous		
Editor:	Sean McGrane	Converted to Well:	☒ Yes ☐ No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
281	120			Topock - Alluvium Deposits	ML				(0.0 - 297.0') No water used
282							(282.0 - 288.0') Topock - Alluvium Deposits; Sandy silt with gravel (ML); reddish brown (2.5YR 4/4); medium plasticity; some very fine to coarse grained sand, angular to round; little granules to medium pebbles, angular to subround; little clay; moist		
283									
284									
285				Topock - Alluvium Deposits	ML				
286									
287	120								
288							(288.0 - 293.0') Topock - Alluvium Deposits; Sandy silt with gravel (ML); reddish brown (2.5YR 4/4); medium plasticity; some very fine to coarse grained sand, angular to subround; little granules to medium pebbles, subangular to subround; little clay; trace cobbles, subround; moist; strong cementation		
289			MW-B-VAS-287-292 (<0.17 U ppb) 2/20/2019 12:15:33 PM						
290									
291				Topock - Alluvium Deposits	ML				
292									
293								(292.0 - 297.0') Drill rods chattering	
294	60			Topock - Weathered Bedrock - conglomerate	GM		(293.0 - 295.0') Topock - Weathered Bedrock - conglomerate; Silty gravel (GM); reddish brown (2.5YR 4/4); medium pebbles to very large pebbles, subangular to subround; little very fine to coarse grained sand, angular to subround; little silt; little clay; trace cobbles, subangular to subround; dry		
295									
296				Topock - Weathered Bedrock - conglomerate	ML		(295.0 - 298.0') Topock - Weathered Bedrock - conglomerate; Gravelly elastic silt with sand (ML); reddish brown (2.5YR 4/4); low plasticity; some granules to large pebbles, angular to subround; little very fine to coarse grained sand, angular to subround; little clay; moist		
297									
298	120							(297.0 - 301.0') Rough drilling	(297.0 - 307.0') 200 gal of water used
299				Topock - Weathered Bedrock - conglomerate	SM		(298.0 - 299.5') Topock - Weathered Bedrock - conglomerate; Silty sand with gravel (SM); brown (7.5YR 5/4); fine grained to very coarse grained, angular to subround; little granules to small pebbles, subangular to subround; little silt; little clay; moist to wet		
300					GM		(299.5 - 301.5') Topock - Weathered Bedrock - conglomerate; Silty		

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Remarks: U = not detected above the laboratory reporting limit, ppb = parts per billion

Boring Log

ARCADIS Design & Consultancy for natural and built assets

Date Started:	01/05/2019	Surface Elevation:	N/A	**Boring No.:**	**MW-Bd**
Date Completed:	02/28/2019	Northing (NAD83):	N/A		
Drilling Co.:	Cascade	Easting (NAD83):	N/A	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	357 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Fullsize Track Mount	Borehole Diameter:	6 inches	Location:	PG&E Topock, Needles, California
Driller Name:	Nick Petrone	Depth to First Water:	21 ft bgs		
Drilling Asst:	T. Alymer/ J. Candelaria	Sampling Method:	10 ft Core Barrel	Project Number:	RC000753.0051
Logger:	G. Willford / C. Bonessi	Sampling Interval:	Continuous		
Editor:	Sean McGrane	Converted to Well:	☒ Yes ☐ No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
301				Topock - Weathered Bedrock - conglomerate	GM		gravel with sand (GM); yellowish red (5YR 4/6); granules to very large pebbles, subangular to round; little fine to very coarse grained sand, angular to subround; little silt; trace cobbles, angular to round; trace clay; wet	(297.0 - 301.0') Rough drilling	(297.0 - 307.0') 200 gal of water used
302									
303							(301.5 - 313.5') Topock - Weathered Bedrock - conglomerate; Sandy elastic silt with gravel (MH); yellowish red (5YR 4/6); high plasticity; some granules to large pebbles, angular to subround; some cobbles, subangular to subround; some very fine to very coarse grained sand, angular to subround; little clay; moist; moderate cementation; gravel primarily composed of metadiorite.		
304	120								
305									
306									
307									
308				Topock - Weathered Bedrock - conglomerate	MH				(307.0 - 322.0') 400 gal of water used
309									
310								(310.0 - 318.0') Rough drilling	
311									
312									
313									
314	180						(313.5 - 320.0') Topock - Weathered Bedrock - conglomerate; Silty sand with gravel (SM); yellowish red / light brown(5YR 5/6); fine grained to very coarse grained, angular to subround; little granules to large pebbles, subangular to subround; little silt; little clay; trace cobbles, subangular to subround		
315									
316									
317				Topock - Weathered Bedrock - conglomerate	SM				
318			MW-B-VAS-317-322 (<0.17 U ppb) 2/21/2019 11:00:33 AM						
319									
320									

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater

Remarks: U = not detected above the laboratory reporting limit, ppb = parts per billion

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Date Started:	01/05/2019	Surface Elevation:	N/A	**Boring No.:**	**MW-Bd**
Date Completed:	02/28/2019	Northing (NAD83):	N/A		
Drilling Co.:	Cascade	Easting (NAD83):	N/A	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	357 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Fullsize Track Mount	Borehole Diameter:	6 inches	Location:	PG&E Topock, Needles, California
Driller Name:	Nick Petrone	Depth to First Water:	21 ft bgs		
Drilling Asst:	T. Alymer/ J. Candelaria	Sampling Method:	10 ft Core Barrel	Project Number:	RC000753.0051
Logger:	G. Willford / C. Bonessi	Sampling Interval:	Continuous		
Editor:	Sean McGrane	Converted to Well:	☒ Yes ☐ No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
321	180		MW-B-VAS-317-322 (<0.17 U ppb) 2/21/2019 11:00:33 AM	Topock - Weathered Bedrock - conglomerate	ML		(320.0 - 322.0') Topock - Weathered Bedrock - conglomerate; Sandy silt with gravel (ML); reddish brown (2.5YR 4/4); medium plasticity; some very fine to coarse grained sand, angular to subround; little granules to medium pebbles, subangular to subround; little clay; trace cobbles, subround; moist; strong cementation		(307.0 - 322.0') 400 gal of water used
322									
323	180			Topock - Weathered Bedrock - conglomerate	ML		(322.0 - 337.0') Topock - Weathered Bedrock - conglomerate; Gravelly silt with sand (ML); reddish brown (2.5YR 4/4); low plasticity; little granules to medium pebbles, subangular to subround; little very fine to coarse grained sand, angular to subround; little clay; trace cobbles, subround; moist	(322.0 - 335.5') tight hard drilling	(322.0 - 337.0') 300 gal of water used
324									
325									
326									
327									
328							(328'); 4-6" dry layer		
329									
330									
331							(331'); 4-6" dry layer		
332									
333							(333'); 4-6" dry layer		
334									
335							(335'); 4-6" dry layer		
336								(335.5 - 337.0') Soft drilling	
337									
338	120			Topock - Weathered Bedrock - conglomerate	SC		(337.0 - 344.0') Topock - Weathered Bedrock - conglomerate; Clayey sand with gravel (SC); red (2.5YR 4/6) to reddish brown (2.5YR 4/4); very fine grained to very coarse grained, subangular to subround; some clay; little granules to medium pebbles, subangular to subround; little silt; trace cobbles, subround; dry to moist; strong cementation		(337.0 - 347.0') No water used
339									
340									

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Boring Log

ARCADIS Design & Consultancy for natural and built assets

Boring No.: MW-Bd

Date Started:	01/05/2019	Surface Elevation:	N/A		
Date Completed:	02/28/2019	Northing (NAD83):	N/A		
Drilling Co.:	Cascade	Easting (NAD83):	N/A	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	357 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Fullsize Track Mount	Borehole Diameter:	6 inches	Location:	PG&E Topock, Needles, California
Driller Name:	Nick Petrone	Depth to First Water:	21 ft bgs		
Drilling Asst:	T. Alymer/ J. Candelaria	Sampling Method:	10 ft Core Barrel	Project Number:	RC000753.0051
Logger:	G. Willford / C. Bonessi	Sampling Interval:	Continuous		
Editor:	Sean McGrane	Converted to Well:	☒ Yes ☐ No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
341									(337.0 - 347.0') No water used
342			MW-B-VAS-339-344 (<0.33 U ppb) 2/27/2019 12:28:00 PM	Topock - Weathered Bedrock - conglomerate	SC				
343									
344	120								
345				Topock - Weathered Bedrock - conglomerate	SC		(344.0 - 347.0') Topock - Weathered Bedrock - conglomerate; Clayey sand (SC); reddish brown(2.5YR 4/3); very fine grained to fine grained, subangular to subround; little clay; trace silt; moist to dry; moderate cementation; clay and sand are interbedded		
346									
347									
348							(347.0 - 356.0') Topock - Weathered Bedrock - conglomerate; Clayey sand with gravel (SC); reddish brown (2.5YR 4/4) to reddish brown(2.5YR 4/3); very fine grained to very coarse grained, subangular to subround; some granules to very large pebbles, angular to subround; little silt; little clay; dry to moist; moderate cementation	(347.0 - 356.0') Rough drilling	(347.0 - 357.0') 400 gal of water used
349									
350									
351				Topock - Weathered Bedrock - conglomerate	SC				
352	108								
353									
354			MW-B-VAS-352-357 (<0.33 U ppb) 2/28/2019 3:05:00 PM						
355									
356								(356.0 - 357.0') Soft drilling	
357				Topock - Weathered Bedrock - conglomerate	SC		(356.0 - 357.0') Topock - Weathered Bedrock - conglomerate; Clayey sand (SC); reddish brown(2.5YR 4/3); very fine grained to medium grained, subangular to subround; little clay; trace small to medium pebbles, subangular to subround; trace silt; moist; weak cementation		
358							End of Boring at 357.0 'bgs.		
359									
360									

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Remarks: U = not detected above the laboratory reporting limit, ppb = parts per billion

ARCADIS Design & Consultancy for natural and built assets

Boring Log

Sheet: 1 of 5

Date Started:	02/12/2019	Surface Elevation:	N/A	**Boring No.:**	**MW-G**
Date Completed:	02/18/2019	Northing (NAD83):	N/A		
Drilling Co.:	Cascade	Easting (NAD83):	N/A	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	87 ft bgs	Project:	Final GW Remedy Phase I
Drill Rig Type:	Prosonic Truck Mount	Borehole Diameter:	N/A	Location:	PG&E Topock, Needles, California
Driller Name:	Steve Vasquez	Depth to First Water:	50 ft bgs		
Drilling Asst:	L. Amaya/ O. Flores	Sampling Method:	4 inch x 10 ft Core Barrel	Project Number:	RC000753.0051
Logger:	Sean McGrane	Sampling Interval:	Continuous		
Editor:	Craig Prunier	Converted to Well:	☒ Yes ☐ No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
1–4	48			Topock - Fill	NR		(0.0 - 4.0') Topock - Fill; No recovery (NR); Hand cleared for utility clearance cuttings not logged		(0.0 - 86.0') 50 gal of water used
4–8				Topock - Fill	SW-SM		(4.0 - 8.5') Topock - Fill; Well graded sand with silt and gravel (SW-SM); brown (7.5YR 4/3); very fine grained to very coarse grained, angular to subround; little granules to large pebbles, angular to subangular; little silt; little clay; coarser clasts composed of metadiorite; dry (7.75'); some granules to very large pebbles, angular to subangular		
8–15	120			Topock - Fill	SC		(8.5 - 15.5') Topock - Fill; Clayey sand with gravel (SC); (5YR4/3); very fine grained to very coarse grained, angular to subangular; little granules to very large pebbles, angular to subangular; little silt; little clay; coarser clasts composed of metadiorite; dry (10.5'); trace cobbles, subangular; iron oxide staining (11'); some granules to very large pebbles, angular to subangular (13'); little granules to very large pebbles, angular to subangular	(15.0 - 17.0') Lost 2 ft of down the hole	
15–17				Topock - Fill	SC		(15.5 - 18.0') Topock - Fill; Clayey sand with gravel (SC); reddish brown / moderate brown(5YR 4/4) and reddish brown (5YR 5/4); very fine grained to very coarse grained, angular to subangular; some granules to very large pebbles, angular to subangular; little silt; little clay; trace cobbles, subangular; some coarser clast composed of conglomerate; little coarser clasts composed of metadiorote; dry	(17.0 - 24.0') Recovered 15 to 18 ft. bgs, 18 to 24 ft. fell out of core barrel, ran 6 inch casing to 18 ft. and recovered 6 ft. of drill run 3, total recovery 7 ft.	
17–20	84			Topock - Alluvium Deposits	ML		(18.0 - 18.5') Topock - Alluvium Deposits; Sandy silt with gravel (ML); low plasticity; some very fine to very coarse grained sand, angular to subround; little granules to large pebbles, angular to subangular; little clay; coarser clasts composed of metadiorite; moist		(18.0 - 18.5') 5 gal of water used
				Topock - Alluvium Deposits	SC		(18.5 - 24.0') Topock - Alluvium Deposits; Clayey sand with gravel (SC); brown (7.5YR 4/3); very fine grained to very coarse grained, angular to subround; some granules to large pebbles, angular to		

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Boring Log

Boring No.: MW-G

Date Started:	02/12/2019	Surface Elevation:	N/A	Client:	PG&E
Date Completed:	02/18/2019	Northing (NAD83):	N/A		
Drilling Co.:	Cascade	Easting (NAD83):	N/A	Project:	Final GW Remedy Phase I
Drilling Method:	Sonic Drilling	Total Depth:	87 ft bgs	Location:	PG&E Topock, Needles, California
Drill Rig Type:	Prosonic Truck Mount	Borehole Diameter:	N/A		
Driller Name:	Steve Vasquez	Depth to First Water:	50 ft bgs		
Drilling Asst:	L. Amaya/ O. Flores	Sampling Method:	4 inch x 10 ft Core Barrel	Project Number:	RC000753.0051
Logger:	Sean McGrane	Sampling Interval:	Continuous		
Editor:	Craig Prunier	Converted to Well:	☒ Yes ☐ No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
21							subangular; little silt; little clay; coarser clasts composed of metadiorite; dry	(17.0 - 24.0') Recovered 15 to 18 ft. bgs, 18 to 24 ft. fell out of core barrel, ran 6 inch casing to 18 ft. and recovered 6 ft. of drill run 3, total recovery 7 ft.	(0.0 - 86.0') 50 gal of water used
22	84			Topock - Alluvium Deposits	SC		(21'); trace cobbles, angular to subangular		
23							(22'); no cobbles		
24									
25				Topock - Alluvium Deposits	SM		(24.0 - 25.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); brown (7.5YR 4/3); very fine grained to very coarse grained, angular to subround; little granules to large pebbles, angular to subangular; little silt; little clay; coarser clasts composed of metadiorite; trace mica; dry		
26				Topock - Alluvium Deposits	SM		(25.0 - 29.3') Topock - Alluvium Deposits; Silty sand with gravel (SM); brown (7.5YR 5/4); very fine grained to very coarse grained, angular to subangular; some granules to very large pebbles, angular to subangular; little silt; trace clay; coarser clast composed of conglomerate; coarser clasts composed of metadiorote; dry		
27	78								
28									
29									
30				Topock - Alluvium Deposits	SM		(29.3 - 35.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); reddish brown (5YR 5/4); very fine grained to very coarse grained, angular to subround; little granules to large pebbles, angular to subround; little silt; little clay; coarser clast composed of conglomerate; coarser clasts composed of metadiorote; dry	(30.0 - 37.0') Top 0.5 ft of core slough.	
31							(30'); trace clay; increase in sand		
32									
33									
34	84						(33.25'); some granules to very large pebbles, angular to subround; trace cobbles, subangular; no clay		
35									
36				Topock - Alluvium Deposits	SM		(35.0 - 37.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); (7.5R 5/4); very fine grained to very coarse grained, angular to subround; some granules to very large pebbles, angular to subround; some silt; trace cobbles, subround; trace clay; coarser clast composed of conglomerate; dry		
37									
38				Topock - Alluvium Deposits	SM		(37.0 - 43.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); reddish brown (5YR 4/3); very fine grained to very coarse grained, angular to subround; some granules to very large pebbles, angular to subround; little silt; trace clay; coarser clasts composed of metadiorite; coarser clast composed of conglomerate; dry	(37.0 - 43.0') Top 0.5 ft. of core is slough	
39	78								
40									

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Boring No.: MW-G

Date Started:	02/12/2019	Surface Elevation:	N/A		
Date Completed:	02/18/2019	Northing (NAD83):	N/A		
Drilling Co.:	Cascade	Easting (NAD83):	N/A	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	87 ft bgs	Project:	Final GW Remedy Phase I
Drill Rig Type:	Prosonic Truck Mount	Borehole Diameter:	N/A	Location:	PG&E Topock, Needles, California
Driller Name:	Steve Vasquez	Depth to First Water:	50 ft bgs		
Drilling Asst:	L. Amaya/ O. Flores	Sampling Method:	4 inch x 10 ft Core Barrel	Project Number:	RC000753.0051
Logger:	Sean McGrane	Sampling Interval:	Continuous		
Editor:	Craig Prunier	Converted to Well:	☒ Yes ☐ No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
41	78			Topock - Alluvium Deposits	SM			(37.0 - 43.0') Top 0.5 ft. of core is slough	(0.0 - 86.0') 50 gal of water used
42									
43									
44	48			Topock - Alluvium Deposits	SM		(43.0 - 48.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); reddish brown (5YR 4/3); very fine grained to very coarse grained, angular to subround; some granules to very large pebbles, angular to subangular; little silt; trace clay; coarser clasts composed of metadiorite; dry		
45									
46									
47							(47'); trace cobbles, subangular; moist to wet	(47.0 - 50.0') Vadose zone moist to wet	
48	78	MW-G-SS-47.0-52.0 2/16/2019 3:55:52 PM		Topock - Alluvium Deposits	SM		(48.0 - 55.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); reddish brown (5YR 4/3); very fine grained to very coarse grained, subangular to round; some silt; little granules to large pebbles, angular to subround; trace cobbles, subangular; trace clay; coarser clasts composed of metadiorite; moist to wet		
49									
50							(50'); wet; no cobbles		
51									
52									
53	48	MW-G-SS-52.0-57.0 2/16/2019 4:00:34 PM	MW-G-VAS-52.0-57.0 (680 ppb) 2/13/2019 4:28:34 PM						
54									
55									
56				Topock - Alluvium Deposits	SM		(55.0 - 57.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); reddish brown / moderate brown(5YR 4/4); very fine grained to very coarse grained, angular to subround; some granules to very large pebbles, angular to subround; little silt; little clay; coarser clasts composed of metadiorite; wet		
57									
58	120	MW-G-SS-57.0-62.0 2/16/2019 4:05:27 PM		Topock - Alluvium Deposits	ML		(57.0 - 57.8') Topock - Alluvium Deposits; Sandy silt (ML); yellowish red / light brown(5YR 5/6); medium plasticity; little granules to medium pebbles, angular; little very fine to very coarse grained sand, angular to subangular; little clay; wet; very stiff	(57.0 - 67.0') Rough drilling, drilled like rock, core was hot with moist to dry sediments	
59				Topock - Alluvium Deposits	ML		(57.8 - 62.0') Topock - Alluvium Deposits; Sandy silt (ML); yellowish red (5YR 4/6); low plasticity; and very fine to very coarse grained sand, angular to subround; little granules to large pebbles, angular to subround; little clay; dry to moist; hard; weak cementation		
60									

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ARCADIS Design & Consultancy for natural and built assets

Boring Log

Boring No.: MW-G

Date Started:	02/12/2019	Surface Elevation:	N/A		
Date Completed:	02/18/2019	Northing (NAD83):	N/A		
Drilling Co.:	Cascade	Easting (NAD83):	N/A	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	87 ft bgs	Project:	Final GW Remedy Phase I
Drill Rig Type:	Prosonic Truck Mount	Borehole Diameter:	N/A	Location:	PG&E Topock, Needles, California
Driller Name:	Steve Vasquez	Depth to First Water:	50 ft bgs		
Drilling Asst:	L. Amaya/ O. Flores	Sampling Method:	4 inch x 10 ft Core Barrel	Project Number:	RC000753.0051
Logger:	Sean McGrane	Sampling Interval:	Continuous		
Editor:	Craig Prunier	Converted to Well:	☒ Yes ☐ No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
61		MW-G-SS-57.0-62.0 2/16/2019 4:05:27 PM		Topock - Alluvium Deposits	ML			(57.0 - 67.0') Rough drilling, drilled like rock, core was hot with moist to dry sediments	(0.0 - 86.0') 50 gal of water used
62									
63	120			Topock - Alluvium Deposits	ML		(62.0 - 64.5') Topock - Alluvium Deposits; Sandy silt with gravel (ML); reddish brown / moderate brown(5YR 4/4); low plasticity; some very fine to very coarse grained sand, angular to subround; little granules to large pebbles, angular to subround; little clay; coarser clasts composed of metadiorite; dry; hard; weak cementation		
64		MW-G-SS-62.0-67.0 2/16/2019 4:10:27 PM							
65				Topock - Alluvium Deposits	CL		(64.5 - 67.0') Topock - Alluvium Deposits; Sandy lean clay with gravel (CL); brown (7.5YR 4/3); medium plasticity; some very fine to very coarse grained sand, angular to subround; little granules to very large pebbles, angular to subround; little silt; moist; soft		
66									
67									
68	60	MW-G-SS-67.0-72.0 2/16/2019 4:15:27 PM	MW-G-VAS-67.0-72.0 (920 ppb) 2/14/2019 4:42:39 PM	Topock - Alluvium Deposits	ML		(67.0 - 67.8') Topock - Alluvium Deposits; Sandy silt (ML); reddish brown (5YR 5/4); low plasticity; some very fine to very coarse grained sand, angular to subround; little granules to very large pebbles, angular to round; little clay; trace cobbles, angular; coarser clasts composed of metadiorite; moist; very stiff	(67.0 - 69.5') Wet zone that might produce water, attempt to collect sample	
69				Topock - Alluvium Deposits	SM		(67.8 - 69.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); brown (7.5YR 4/3); very fine grained to very coarse grained, angular to subround; some silt; little granules to large pebbles, angular to subround; little clay; wet		
70							(69.0 - 76.0') Topock - Alluvium Deposits; Sandy silt (ML); reddish brown (5YR 5/4); low plasticity; some very fine to very coarse grained sand, angular to subround; little granules to very large pebbles, angular to round; little clay; coarser clasts composed of metadiorite; moist; very stiff	(69.5 - 72.0') Drilled like rock core hot and dry	
71							(69.5'); trace cobbles, subangular to subround; coarser clast composed of conglomerate; dry; weak cementation		
72									
73				Topock - Alluvium Deposits	ML		(72'); moist to wet; weak cementation	(72.0 - 86.0') Used water to flush fines out of casing for well install	
74		MW-G-SS-72.0-77.0 2/17/2019 4:15:27 PM							
75									
76	120			Topock - Alluvium Deposits	SM		(76.0 - 77.5') Topock - Alluvium Deposits; Silty sand with gravel (SM); reddish brown / moderate brown(5YR 4/4); very fine grained to very coarse grained, angular to subround; little granules to large pebbles, angular to subangular; little silt; little clay; coarser clasts composed of metadiorite; wet		
77									
78		MW-G-SS-72.0-77.0 2/17/2019 4:15:27 PM	MW-G-VAS-77.0-82.0 (600 ppb) 2/15/2019 12:12:10 PM	Topock - Alluvium Deposits	SM		(77.5 - 79.5') Topock - Alluvium Deposits; Silty sand with gravel (SM); reddish brown (2.5YR 4/4); very fine grained to very coarse grained, angular to subround; little granules to very large pebbles, angular to subangular; little silt; coarser clasts composed of metadiorite; wet		
79									
80					SM		(79.5 - 81.0') Topock - Alluvium Deposits; Silty sand with gravel (SM);		

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ARCADIS Design & Consultancy for natural and built assets

Boring Log

Boring No.: MW-G

Date Started:	02/12/2019	Surface Elevation:	N/A		
Date Completed:	02/18/2019	Northing (NAD83):	N/A		
Drilling Co.:	Cascade	Easting (NAD83):	N/A	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	87 ft bgs	Project:	Final GW Remedy Phase I
Drill Rig Type:	Prosonic Truck Mount	Borehole Diameter:	N/A	Location:	PG&E Topock, Needles, California
Driller Name:	Steve Vasquez	Depth to First Water:	50 ft bgs		
Drilling Asst:	L. Amaya/ O. Flores	Sampling Method:	4 inch x 10 ft Core Barrel	Project Number:	RC000753.0051
Logger:	Sean McGrane	Sampling Interval:	Continuous		
Editor:	Craig Prunier	Converted to Well:	☒ Yes ☐ No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
81	120	MW-G-SS-72.0-77.0 2/17/2019 4:15:27 PM	MW-G-VAS-77.0-82.0 (600 ppb) 2/15/2019 12:12:10 PM	Topock - Alluvium Deposits	SM		reddish brown (2.5YR 4/4); very fine grained to very coarse grained; some granules to large pebbles, angular to subround; some silt; trace clay; coarser clasts composed of metadiorite; wet	(72.0 - 86.0') Used water to flush fines out of casing for well install	(0.0 - 86.0') 50 gal of water used (72.0 - 86.0') 600 gal of water used (72.0 - 86.0') 600 gal of water used
82				Topock - Weathered Bedrock - conglomerate	SM		(81.0 - 82.0') Topock - Weathered Bedrock - conglomerate; Silty sand with gravel (SM); reddish brown (2.5YR 4/4); very fine grained to very coarse grained, angular to subround; some granules to large pebbles, angular to subround; little silt; little clay; trace cobbles, subangular; moist		
83	60			Topock - Competent Bedrock - conglomerate			(82.0 - 87.0') Topock - Competent Bedrock - conglomerate; reddish brown (2.5YR 4/4); dry; weak cementation; friable	(83.0 - 87.0') Core barrel was geting hung up in hole, possible indication of bedrock	
84									
85									
86									
87									
88							End of Boring at 87.0 'bgs.		
89									
90									
91									
92									
93									
94									
95									
96									
97									
98									
99									
100									

Notes: USCS = Unified Soil Classification System, ppb = Parts per Billion.

ARCADIS Design & Consultancy for natural and built assets

Boring Log

Sheet: 1 of 3

Date Started:	03/29/2019	Surface Elevation:	N/A	**Boring No.:**	**IRZ-39 Pilot**
Date Completed:	03/31/2019	Northing (NAD83):	N/A		
Drilling Co.:	Cascade	Easting (NAD83):	N/A	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	54 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Terrasonic track mount	Borehole Diameter:	6-12 inches	Location:	PG&E Topock, Needles, California
Driller Name:	Dan O'Mara	Depth to First Water:	26.61 ft bgs		
Drilling Asst:	E. Huellmantel / J. Pacheco	Sampling Method:	4 inch x 10 ft Core Barrel	Project Number:	RC000753.0051
Logger:	Grant Willford	Sampling Interval:	Continuous		
Editor:	Sean McGrane	Converted to Well:	☐ Yes ☒ No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
1	12			Topsoil	SM		(0.0 - 0.5') Topsoil; Silty sand with gravel (SM); very fine grained to very coarse grained, angular to subangular; little granules to medium pebbles, angular to subround; little silt; little clay; dry; homogeneous; some organics, small pieces of grass		
				Topock - Fill			(0.5 - 0.6') Topock - Fill; Asphalt		
2	30			Topock - Alluvium Deposits	SM		(0.6 - 2.5') Topock - Alluvium Deposits; Silty sand with gravel (SM); brown (7.5YR 4/4); very fine grained to very coarse grained, angular to subangular; some granules to medium pebbles, angular to subround; little silt; little clay; dry; homogeneous		
3				Topock - Alluvium Deposits	GP		(2.5 - 3.0') Topock - Alluvium Deposits; Poorly graded gravel (GP); (10YR 2.5/1); boulders, angular; dry; boulder composed of metadiorite	(2.5 - 6.0') Soft drilling	
4	42			Topock - Alluvium Deposits	GC		(3.0 - 5.5') Topock - Alluvium Deposits; Clayey gravel with sand (GC); reddish brown / moderate brown(5YR 4/4) some red (2.5YR 5/6); granules to large pebbles, angular to subangular; some very fine to very coarse grained sand, angular to subround; little silt; little clay; dry; iron oxide staining; gravel composed of mixed lithology; mostly metadiorite, few organics observed, small pieces of grass		
5									
6				Topock - Alluvium Deposits	SC		(5.5 - 16.0') Topock - Alluvium Deposits; Clayey sand with gravel (SC); reddish brown (5YR 5/4) some reddish brown (2.5YR 4/4); very fine grained to very coarse grained, angular to subangular; some granules to large pebbles, angular to subangular; dry; iron oxide staining; gravel composed of mixed litholgy; mostly metadiorite	(6.0 - 16.0') Soft drilling	
7									
8									
9									
10									
11	114								
12									
13									
14									
15									
16									
17				Topock - Alluvium Deposits	SC		(16.0 - 20.0') Topock - Alluvium Deposits; Clayey sand with gravel (SC); brown (7.5YR 4/4) with reddish brown / moderate brown(5YR 4/4); very fine grained to very coarse grained, angular to subround; some granules to large pebbles, angular to subangular; some clay; little silt; dry; weak cementation; iron oxide staining	(16.0 - 26.0') Soft drilling	
18	120								
19									
20									

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater

Remarks:

ARCADIS Design & Consultancy for natural and built assets

Boring Log

Boring No.: IRZ-39 Pilot

Date Started:	03/29/2019	Surface Elevation:	N/A		
Date Completed:	03/31/2019	Northing (NAD83):	N/A		
Drilling Co.:	Cascade	Easting (NAD83):	N/A	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	54 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Terrasonic track mount	Borehole Diameter:	6-12 inches	Location:	PG&E Topock, Needles, California
Driller Name:	Dan O'Mara	Depth to First Water:	26.61 ft bgs		
Drilling Asst:	E. Huellmantel / J. Pacheco	Sampling Method:	4 inch x 10 ft Core Barrel	Project Number:	RC000753.0051
Logger:	Grant Willford	Sampling Interval:	Continuous		
Editor:	Sean McGrane	Converted to Well:	☐ Yes ☒ No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
21				Topock - Alluvium Deposits	SC		(20.0 - 25.0') Topock - Alluvium Deposits; Clayey sand with gravel (SC); reddish brown / moderate brown(5YR 4/4) little red (2.5YR 5/6); very fine grained to very coarse grained, angular to subangular; some clay; little granules to medium pebbles, angular to subangular; little silt; dry; weak cementation; iron oxide staining	(16.0 - 26.0') Soft drilling	
22									
23	120								
24									
25				Topock - Alluvium Deposits	SC		(25.0 - 26.0') Topock - Alluvium Deposits; Clayey sand with gravel (SC); reddish brown (5YR 5/4) some reddish brown (2.5YR 4/4); very fine grained to very coarse grained, angular to subangular; some granules to large pebbles, angular to subangular; little silt; little clay; dry to moist; weak cementation; gravel composed of mixed litholgy; mostly metadiorite, moist at 25.6'		
26								(26.0 - 36.0') Rough drilling	
27				Topock - Alluvium Deposits	SC		(26.0 - 29.0') Topock - Alluvium Deposits; Clayey sand with gravel (SC); dark reddish gray (5YR 4/2) with red (2.5YR 4/6); very fine grained to very coarse grained, angular to subround; little granules to medium pebbles, angular to subangular; little silt; little clay; moist; moderate cementation; iron oxide staining; gravel composed of mixed litholgy; mostly metadiorite		
28		IRZ-39-SS-26-31 3/31/2019 10:27:47 AM							
29			IRZ-39-VAS-27-32 (29 ppb) 3/30/2019 9:16:17 AM	Topock - Alluvium Deposits	SC		(29.0 - 30.0') Topock - Alluvium Deposits; Clayey sand with gravel (SC); red (2.5YR 4/6) some red / moderate reddish brown(10R 4/6); very fine grained to very coarse grained, angular to subround; some granules to very large pebbles, angular to subangular; little cobbles, subangular; little silt; little clay; moist to dry; moderate cementation; iron oxide staining; gravel composed of mixed litholgy, mostly metadiorite, moist from 29-30', dry from 30-36'		
30									
31	120						(30.0 - 39.0') Topock - Weathered Bedrock - conglomerate; Clayey sand with gravel (SC); red (2.5YR 4/6) some red / moderate reddish brown(10R 4/6); very fine grained to very coarse grained, angular to subround; some granules to very large pebbles, angular to subangular; little cobbles, subangular; little silt; little clay; moist to dry; moderate cementation; iron oxide staining; gravel composed of mixed litholgy, mostly metadiorite		
32									
33		IRZ-39-SS-31-36 3/31/2019 10:31:04 AM							
34				Topock - Weathered Bedrock - conglomerate	SC				
35									
36								(36.0 - 46.0') Rough drilling	
37									
38	36	IRZ-39-SS-36-41 3/31/2019 10:34:04 AM							
39									
40	84			Topock - Competent Bedrock -			(39.0 - 44.0') Topock - Competent Bedrock - conglomerate; red (2.5YR 5/6); dry; iron oxide staining; firable conglomerate, highly fractured and pulverized, when moist pulverized rock has low		

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater

Remarks:

ARCADIS Design & Consultancy for natural and built assets

Boring Log

Boring No.: IRZ-39 Pilot

Date Started:	03/29/2019	Surface Elevation:	N/A		
Date Completed:	03/31/2019	Northing (NAD83):	N/A		
Drilling Co.:	Cascade	Easting (NAD83):	N/A	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	54 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Terrasonic track mount	Borehole Diameter:	6-12 inches	Location:	PG&E Topock, Needles, California
Driller Name:	Dan O'Mara	Depth to First Water:	26.61 ft bgs		
Drilling Asst:	E. Huellmantel / J. Pacheco	Sampling Method:	4 inch x 10 ft Core Barrel	Project Number:	RC000753.0051
Logger:	Grant Willford	Sampling Interval:	Continuous		
Editor:	Sean McGrane	Converted to Well:	☐ Yes ☒ No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
41				conglomerate			plasticity, moderate to strong cementation	(36.0 - 46.0') Rough drilling	
42				Topock - Competent Bedrock - conglomerate					
43	84	IRZ-39-SS-41-46 3/31/2019 10:40:04 AM	no sample (Interval did not produce)						
44							(44.0 - 54.0') Topock - Competent Bedrock - conglomerate; red (2.5YR 5/6); dry; moderate cementation; iron oxide staining; friable conglomerate, core not as pulverized as from 39-44 feet bgs		
45									
46								(46.0 - 54.0') Rough drilling, lost core down the borehole, had to go back in to retrieve 49 to 54 ft bgs	
47									
48									
49				Topock - Competent Bedrock - conglomerate					
50	96								
51									
52									
53									
54							End of Boring at 54.0 'bgs.		
55									
56									
57									
58									
59									
60									

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater

Remarks:

Attachment C
Soil Sampling Locations and Available Soil Analytical Results
(Soil Data Presented in Excel File)

LEGEND

- Soil Sample Location

0 100 200
Feet

N

Baseline and Opportunistic Soil Sampling Locations

April 2019 Monthly Progress Report
Groundwater Remedy Phase 1 Construction
PG&E Topock Compressor Station, Needles, California

Attachment D
Perimeter Air Sampling Analytical Results

Attachment D. Perimeter Air Sampling Analytical Results

In conformance with the approved *Construction/Remedial Action Work Plan for the Final Groundwater Remedy, PG&E Topock Compressor Station, Needles, California* (CH2M, 2015), air monitoring has been conducted during construction to evaluate the ongoing effectiveness of the dust control program, to guide modifications to field activities and engineering control measures, if necessary, and to document that construction activities do not result in the migration of soil contaminants beyond the work area boundaries.

Perimeter air monitoring has been performed if construction activities have the potential to generate visible dust. The air monitoring program consists of both real-time fugitive dust monitoring and perimeter air sampling for select soil contaminants. Locations to be monitored and sampled are as follows:

- Real-time fugitive dust monitoring is performed at the perimeter of the work areas (outside of the exclusion zone) that have the potential to generate visible dust, including the Construction Headquarters (CHQ) and the Soil Processing Yard (SPY).
- Perimeter air sampling for hexavalent chromium is performed at the perimeter of the work areas (outside of the exclusion zone) that are inside Areas of Concern (AOCs) within the construction footprint where hexavalent chromium concentrations in soil have been historically reported. Air sampling for hexavalent chromium in the SPY will be performed when soil from AOCs with reported concentrations of hexavalent chromium is actively being processed. Air sampling may also be performed at other work areas at the site based on hexavalent chromium concentrations reported from new soil data or based on field observations during construction activities.
- Air sampling for asbestos will be limited to work areas where Asbestos Containing Material (ACM) has been observed in prior field investigations, including two areas in AOC 12 and one area in AOC 4. Perimeter air monitoring may also be performed at other work areas at the site if ACM is discovered during construction activities.

Project-specific levels of concern (LOC) and action levels were developed as an indicator to determine whether additional dust control measures, as presented in the project's Dust Control Plan required by the Mojave Desert Air Quality Management District (MDAQMD), are necessary.

- The LOCs, which represent conservative concentrations of compounds that receptors outside the work area could be safely exposed to during construction, have been evaluated for all compounds that have been detected in soil samples collected at the site in the prior investigations. The LOCs were developed using standard U.S. Environmental Protection Agency (USEPA) and California Environmental Protection Agency risk assessment methodology, toxicology data, and exposure assumptions (USEPA, 2009, 2017; California Department of Toxic Substances Control [DTSC], 2018). Both cancer and noncancer health effects were considered. For each type of health effect, the LOC was back-calculated from an established target or from acceptable cancer risk or noncancer hazard where USEPA or DTSC toxicity values are available. The LOCs for cancer effects are based on a target excess cancer risk of one in a million (1×10^{-6}). The LOCs for noncancer effects are based on a target hazard quotient of 1. The LOCs were developed using these assumptions:
  - Receptors are present outside the perimeter of the work areas
  - Exposure via inhalation is 10 hours per day for a 10 days on /4 days off schedule
  - Duration of Phase 1 of the final groundwater remedy construction is 20 months
- The action level for fugitive dust monitoring is 100 micrograms per cubic meter ($\mu g/m^3$) for a net (downwind minus upwind) dust concentration. This action level is based on MDAQMD Rule 403, Part C. A 10-hour time-weighted average of readings collected throughout the work day will be used to document compliance with MDAQMD Rule 403.
- For analytes detected in soil, the following equation was used to calculate maximum allowable airborne particulate concentrations for receptor exposure outside the work area (based on the approach presented by Marlowe (1999):

$$AL = \frac{LOC\ x\ 1{,}000{,}000\ mg/kg}{CS}$$

Where:

AL = action level for airborne particulates (µg/m^3)

LOC = Project specific risk-based level of concern (µg/m^3)

CS = maximum detected concentration of compound in site soil (milligrams per kilogram [mg/kg])

Action levels were determined as follows:

- Soil data from prior investigations were gathered for the entire site.
- Sample locations within the maximum construction footprint were evaluated. Some sample locations were removed from evaluation as they were within the compressor station in locations where no construction activities will actually occur.
- The maximum reported soil concentration for each compound was determined and then used to calculate an airborne particulate action level.
- All compounds had allowable airborne particulate action levels greater than 100 µg/m^3 except for hexavalent chromium at a few locations.
- Lead does not have USEPA or DTSC toxicity values; however, an action level was calculated using the DTSC (2011) LeadSpread 8 model. This is based on the maximum reported soil concentration for lead of 1,400 mg/kg from samples collected within the construction footprint and a blood level of concern through inhalation of 1 microgram per deciliter. The resulting action level for lead is 548 µg/m^3.
- Therefore, keeping fugitive dust below the action level 100 µg/m^3 will result in airborne particulate concentrations of contaminants (other than hexavalent chromium) remaining below their respective LOCs.
- Fugitive dust monitoring will be used to evaluate airborne contaminants in dust for all compounds except for hexavalent chromium.

In April 2019, 53 real time dust observation/monitoring events were conducted at the perimeter of the work areas (outside of the exclusion zone). On April 29, 2019, there was one temporary exceedance of the action level for fugitive dust monitoring (100 µg/m3) during high wind in the floodplain. However, the technician who monitored dust attributed the spike in dust level to a burst of sand lifted by high wind in the vicinity of the monitoring location, and not to the project activities. Water was applied by the field crew to their immediate work area prior to the high wind event. The field crew was operating hand tool as part of Pipeline C installation.

No perimeter air sampling for hexavalent chromium was conducted in April 2019.

References Cited:

California Department of Toxic Substances Control (DTSC). 2011. LeadSpread 8. https://www.dtsc.ca.gov/AssessingRisk/LeadSpread8.cfm.

California Department of Toxic Substances Control (DTSC). 2018. Human Health Risk Assessment Note 3 – DTSC-Modified Screening Levels (DTSC-SLs), California Department of Toxic Substances Control, Human and Ecological Risk Office (HERO). January.

CH2M HILL, Inc. (CH2M). 2015. *Construction/Remedial Action Work Plan for the Final Groundwater Remedy, PG&E Topock Compressor Station, Needles, California.* November 18.

Marlowe, C. 1999. *Safety Now! Controlling Chemical Exposures at Hazardous Waste Sites with Real-Time Measurements*. Fairfax, Va.: American Industrial Hygiene Association Press.

U.S. Environmental Protection Agency (USEPA). 2009. *Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part F, Supplemental Guidance for Inhalation Risk Assessment)*. Final. OSWER 9285.7-82. January.

U.S. Environmental Protection Agency (USEPA). 2017. Regional Screening Levels (RSLs)—Generic Tables. November.

Attachment E
Noise Monitoring Results
(SEIR NOISE-2 Requirement)

Attachment E. Noise Monitoring Results

In conformance with the SEIR Mitigation Measure NOISE-2, noise monitoring has been conducted with ANSI S1.4 Type 1, precision sound level meters when construction activities are within the specified distance (e.g., 1,850 feet from sensitive receptors in California) at approved monitoring locations previously determined in coordination with the Tribes and land owners/managers (refer to Figures 1, 2 and 3). The goal of the noise monitoring is to identify if noise levels from project construction activities exceed applicable standards of the San Bernardino and Mohave County codes. Exceedance of standards would require coordination with the Tribes and land owners/managers to evaluate the potential constraints and locations for temporary engineered acoustical barriers. Consistent with the request of the Tribes, monitoring equipment is not left at the approved monitoring locations, rather it is mounted on a tripod for attended representative measurements and removed when the monitoring event is complete.

When a new construction activity is conducted or a previously monitored construction activity is conducted closer to a noise-sensitive area, monitoring is conducted at more frequent intervals to evaluate the potential need for an acoustical barrier. As the activities continue in the same location and multiple attended measurements indicate that the applicable standard has not been exceeded by the construction activity, periodic attending monitoring events are conducted to confirm continued compliance.

The attended monitoring events document the A-weighted L_{eq} sound level at periodic intervals (e.g., 5, 10, 15, 20, 30, 40, 50 and 60 minutes). The trend of the data at these intervals is evaluated in the field to assess the stability in the sound level to determine the duration of the monitoring event. When this interval data is relatively stable or clearly below the standard, the attended monitoring event will typically be 15 to 30 minutes in duration. As the applicable standards are in terms of the 24-hour average L_{dn} which is based on the L_{eq} metric, the measured L_{eq} is compared to the applicable L_{dn} standard for mobile noise sources (i.e., 60 A-weighted decibels [dBA] for Park Moabi, 65 dBA at all other locations). This results in a reasonable and conservative assessment given construction activities are not emitting noise continuously over a 24-hour period, nor are they occurring during the nighttime hours (10 p.m. to 7 a.m.).

In April 2019, 34 monitoring events have been conducted at the Park Moabi monitoring location (Figure 1). Construction activities closest to this monitoring location include activities at the SPY and CHQ, as well as construction traffic on NTH. The sound level typically varied between 41 and 58 dBA.

In April 2019, 31 monitoring events have been conducted at Maze B-Combined Area 1/2 (Figure 2). Construction activities closest to this monitoring location include activities at MW-N and MW-20 Bench, as well as construction traffic on the access road. The sound levels varied between 46 and 62 dBA.

In April 2019, 32 monitoring events have been conducted at Maze C-Area 1 (Figure 2). Construction activities closest to this monitoring location include construction traffic on NTH, drilling, and pipeline activities in the northern end of the floodplain. Instantaneous sound levels spiked due to boat activities in the river. The sound level typically varied between 43 and 74 dBA.

In April 2019, one monitoring event occurred at Maze A-Area 2 (Figure 3), during site preparation activities for MW-S. Construction activities closest to this monitoring location include well drilling in Bat Cave Wash. The sound level varied between 50 and 61 dBA. Continuous noise from I-40 was noted during these events.

In April 2019, three monitoring events occurred at Maze A-Area 3 (Figure 3). The sound level varied between 50 and 66 dBA. The instantaneous sound level spiked when an aircraft flew nearby.

In early April 2019, the original approved Maze A-Area 1 noise monitoring location was inaccessible due to the access route to the location was deemed unsafe by Construction Health and Safety (AEG). PG&E notified DTSC on April 12 of this determination. Jacobs' Noise Engineer, Mark Bastasch, was engaged to evaluate possible alternative locations for noise monitoring of drilling activities at the MW-U location in I-40 median. An alternate location in the I-40 median, 200 feet east of the drilling location was selected.

Two sound monitoring events were conducted on April 16 and 17 at this alternate location. Sound monitoring on April 16 documented existing average sound levels without drilling operations were 69 dBA $L_{eq.}$ During drilling operations, measurements on April 17 documented an average sound level of 72 dBA L_{eq}. The drilling operations were noted to be audible, but not to louder than passing heavy trucks. A 3 dBA increase is generally consider the threshold of a perceivable difference when comparing similar sounds (e.g., traffic to traffic). While audibility depends on numerous factors, as exemplified by being able to hear a bird chirp in the presence of heavy traffic noise, the observation that drilling noise is audible aligns with the slight increase in measured sound levels.

While both the ambient and drilling sound levels both exceed the sound level for which a sound barrier would be evaluated under NOISE-2, the addition of a barrier at MW-U may not provide substantial benefit for a large portion of the Maze A given it is already shielded by topography (i.e., topographic edge effects already provide shielding for areas set back from the edge of the Maze). In addition, the barrier material may pose a hazard to the public traveling on Interstate 40. High winds in the area present a risk that the barrier may become damaged, dislodged and blown into Interstate 40. Installation of a sound barrier in the median of I-40 will require Caltrans' approval.

Given the complications associated with accessing the noise monitoring location and the risk associated with deploying a sound barrier that is anticipated to be of minor benefit, PG&E sought concurrence from DTSC to cease noise monitoring at MW-U. On April 26, 2019, DTSC provided concurrence that noise monitoring at MW-U can be suspended.

Monitoring will continue as work progresses and moves into new areas to identify when an acoustical barrier needs to be considered.

Park Moabi Slough

MOABI REGIONAL PARK

ST: 3 (2008)

ST: 3 (2016)

ST: 3 (2012)

LT: D (2016)

Park Moabi Rd.

LEGEND

- Aboveground Pipe
- Underground Pipe/Conduit
- 1,850' Noise Monitoring Buffer for Construction Activities conducted between 7AM and 10PM
- Noise Sensitive Receptor (per Final SEIR)

Area/Access Route for Noise Monitoring (Agreed to by concensus during 5/10/18 Site Walk)

- Area
- Access Routes
- Area for Noise Monitoring (Proposed by PG&E prior to 5/10/18 Site Walk)

- Moabi Regional Park Facilities
- EIR Boundary

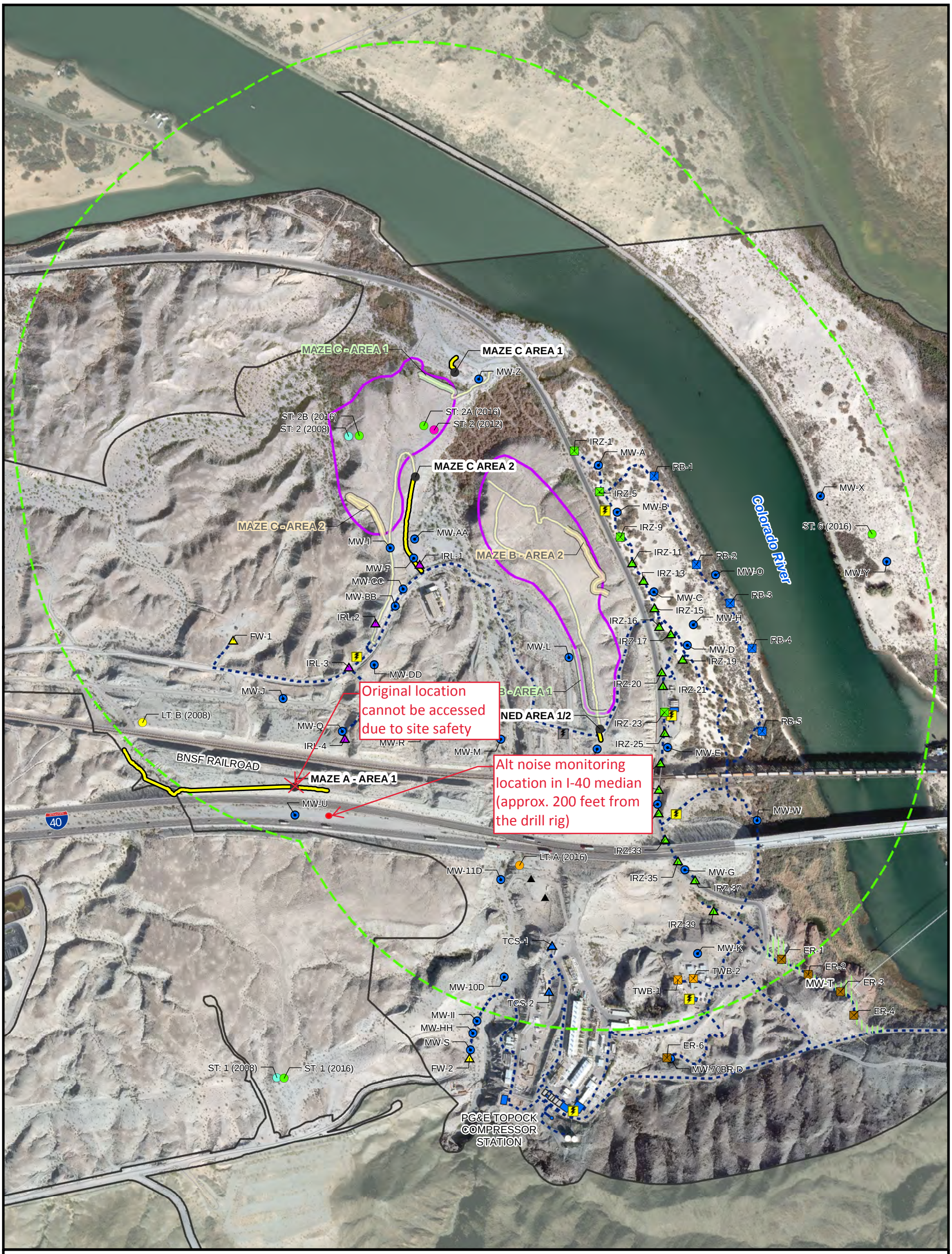
0 275 550 1,100 Feet

N

FIGURE 1
NOISE MONITORING AREA - MOABI REGIONAL PARK
GROUNDWATER REMEDY CONSTRUCTION/
PHASE 1 CONSTRUCTION
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

CH2MHILL

Path: \\brooksidefiles\GIS_SHARE\ENBG\00_Proj\P\PGE\Topock\MapFiles\2018\NoiseMonitoring\Fig1_Noise_Monitoring_Moabi.mxd



LEGEND

Planned Wells:
- Extraction, East Ravine
- Extraction, NTH IRZ
- Extraction, Riverbank
- Extraction, Transwestern Bench
- Injection, Freshwater
- Injection, Inner Recirculation Loop
- Injection, NTH IRZ
- Injection, Topock Compressor Station
- Remedy Monitoring Well
- Recirculation Well
- Area for Monitoring Well MW-T

Pipeline Corridor for Remedy
- Underground Pipe/Conduit

Remedy Facilities
- Planned Transformer
- Future Provisional Transformer
- Proposed Remedy Structure
- Contingent Freshwater Pre-injection Treatment System
- 1,850' Noise Monitoring Buffer for Construction Activities conducted between 7AM and 10PM
- Noise Sensitive Receptor (per Final SEIR)
- EIR Boundary

Areas/Access Routes for Noise Monitoring (Agreed to by concensus during 5/10/18 Site Walk)
- Area
- Access Route

Areas for Noise Monitoring (Proposed by PG&E Prior to 5/10/18 Site Walk)
- Area 1
- Area 2
- Access Route

N

0 275 550 1,100
Feet

FIGURE 2
NOISE MONITORING AREAS- NORTH OF I-40
GROUNDWATER REMEDY CONSTRUCTION/ PHASE 1 CONSTRUCTION
PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

CH2MHILL

\\brooksidefiles\GIS_SHARE\ENBG\00_Proj\P\PGE\Topock\MapFiles\2018\NoiseMonitoring\Fig2_Noise_Monitoring_N_of_I-40.mxd

MW-Z
ST: 2B (2016)
ST: 2 (2008)
ST: 2A (2016)
ST: 2 (2012)
IRZ-1
MW-A
RB-1
IRZ-03
IRZ-5
MW-B
IRZ-9
Colorado River
MW-AA
MW-I
IRL-1
MW-P
IRZ-11
RB-2
MW-O
MW-CC
IRZ-13
MW-C
RB-3
MW-BB
IRZ-15
IRL-2
IRZ-16
MW-H
RB-4
FW-1
IRZ-17
MW-L
MW-D
IRL-3
IRZ-19
MW-DD
LT: B (2016)
IRZ-20
MW-J
IRZ-21
MW-GG
LT: B (2008)
RB-5
MW-Q
IRZ-23
MW-FF
MW-R
IRL-4
IRZ-25
MW-E
MW-M
MW-N
BNSF RAILROAD
IRZ-27
IRZ-29
MW-U
MW-F
MAZE A - AREA 2
IRZ-31
MW-W
MAZE A - AREA 1
LT: A (2016)
IRZ-33
IRZ-35
MW-G
MW-11D
IRZ-37
MAZE A - AREA 2
IRZ-39
TCS-1
MW-K
ER-1
TWB-2
MW-T
MW-10D
TWB-1
TCS-2
MW-II
MW-HH
MW-S
ER-6
FW-2
MW-70BR-D
ST: 1 (2008)
ST: 1 (2016)
MAZE A - AREA 3
PG&E TOPOCK
COMPRESSOR
STATION
MAZE A - AREA 3

LEGEND

Planned Wells:
- Extraction, East Ravine
- Extraction, NTH IRZ
- Extraction, Riverbank
- Extraction, Transwestern Bench
- Injection, Freshwater
- Injection, Inner Recirculation Loop
- Injection, NTH IRZ
- Injection, Topock Compressor Station
- Remedy Monitoring Well
- Recirculation Well

Area for Monitoring Well MW-T

Pipeline Corridor for Remedy
- Underground Pipe/Conduit

Remedy Facilities
- Planned Transformer
- Future Provisional Transformer
- Proposed Remedy Structure
- Contingent Freshwater Pre-injection Treatment System
- 1,850' Noise Monitoring Buffer for Construction Activities conducted between 7AM and 10PM
- Noise Sensitive Receptor (per Final SEIR)
- EIR Boundary

Areas/Access Routes for Noise Monitoring (Agreed to by concensus during 5/10/18 Site Walk)
- Area
- Access Route

Areas for Noise Monitoring (Proposed by PG&E Prior to 5/10/18 Site Walk)
- Area 1
- Area 2
- Area 3
- Access Route

N

0 275 550 1,100
Feet

FIGURE 3
NOISE MONITORING AREAS - SOUTH OF I-40
GROUNDWATER REMEDY CONSTRUCTION/
PHASE 1 CONSTRUCTION
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

CH2MHILL

\\brooksidefiles\GIS_SHARE\ENBG\00_Proj\P\PGE\Topock\MapFiles\2018\NoiseMonitoring\Fig3_Noise_Monitoring_S_of_I-40.mxd

Attachment F
Six-Week Look-Ahead Schedule
(May 5 through June 15, 2019)

Topock Final Groundwater Remedy Construction
Field Work Look-ahead Schedule

PG&E Topock Final Groundwater Remedy	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Primary Planned Activities	**5/5/2019**	**5/6/2019**	**5/7/2019**	**5/8/2019**	**5/9/2019**	**5/10/2019**	**5/11/2019**
Start Time (PST)	7:00 AM	7:00 AM	7:00 AM	7:00 AM	7:00 AM	7:00 AM	7:00 AM
Pipeline C Installation E5, F5		C4/C5/C6 pipeline intersection installation Pipeline features install C3-C5	C4/C5/C6 pipeline intersection installation Pipeline features install C3-C5	C4/C5/C6 pipeline intersection installation Pipeline features install C3-C5	C4/C5/C6 pipeline intersection installation Pipeline features install C3-C5	Preparation for hydrostatic testing @ C5/C4/C3	
Well Installation	--	--	MW-O (E5), MW-M (F5), IRZ-25 (F5), MW-U Development (F4)	MW-O (E5), MW-M (F5), IRZ-25 (F5), MW-U Development (F4), RB-2 Site Prep (E5)	MW-O (E5), MW-M (F5), IRZ-25 (F5), MW-U Development (F4), RB-2 Site Prep (E5)	MW-O (E5), MW-M (F5), IRZ-25 (F5), MW-U Development (F4), RB-2 Site Prep (E5)	MW-O (E5), MW-M (F5), IRZ-25 (F5), IRZ-20 Development (E5), RB-2 Site Prep (E5)
Floodplain Access Road (E5), (F5)		Access road install @ C5					
IM3 Brine Tank Upgrade (E5)	Form Walls	Set Tank			Set Tank	Form Walls	Form Walls
Primary Planned Activities	**5/12/2019**	**5/13/2019**	**5/14/2019**	**5/15/2019**	**5/16/2019**	**5/17/2019**	**5/18/2019**
Start Time (PST)	7:00 AM	7:00 AM	7:00 AM	7:00 AM	7:00 AM	7:00 AM	7:00 AM
Pipeline C Installation E5, F5		Tentative: Hydrostatic testing @ C5/4/3, Pipeline installation @ C8	Tentative: Hydrostatic testing @ C5/4/3, Pipeline installation @ C8	Tentative: Hydrostatic testing @ C5/4/3, Pipeline installation @ C8	Tentative: Hydrostatic testing @ C5/4/3, Pipeline installation @ C8	Tentative: Hydrostatic testing @ C5/4/3, Pipeline installation @ C8	
Pre-Trenching/Excavation Potholling and Characterization (F5), (G5)		Potholing, Air-vac, TCS & Existing Utilities	Potholing, Air-vac, TCS & Existing Utilities	Potholing, Air-vac, TCS & Existing Utilities	Potholing, Air-vac, TCS & Existing Utilities	Potholing, Air-vac, TCS & Existing Utilities	
Well Installation	MW-O (E5), MW-M (F5), IRZ-21 (E5), IRZ-20 Development (E5), RB-2 Site Prep (E5)	MW-O (E5), MW-M (F5), IRZ-21 (E5), IRZ-20 Development (E5)	MW-O (E5), MW-M (F5), IRZ-21 (E5), IRZ-20 Development (E5)	MW-O (E5), MW-M (F5), IRZ-21 (E5), IRZ-20 Development (E5)	MW-O (E5), MW-S (G5), IRZ-21 (E5), IRZ-20 Development (E5)	MW-O (E5), MW-S (G5), IRZ-21 (E5), IRZ-20 Development (E5)	--
IM3 Brine Tank Upgrade (E5)	Form Walls	Form Walls			Pour Walls		
Primary Planned Activities	**5/19/2019**	**5/20/2019**	**5/21/2019**	**5/22/2019**	**5/23/2019**	**5/24/2019**	**5/25/2019**
Start Time (PST)	7:00 AM	7:00 AM	7:00 AM	7:00 AM	7:00 AM	7:00 AM	7:00 AM
Pipeline C Installation E5, F5		Pipeline installation @ C8	Pipeline installation @ C8	Pipeline installation @ C8	Pipeline installation @ C8	Pipeline installation @ C8	
Pre-Trenching/Excavation Potholling and Characterization (F5), (G5)		Potholing, Air-vac, TCS & Existing Utilities	Potholing, Air-vac, TCS & Existing Utilities	Potholing, Air-vac, TCS & Existing Utilities			
Floodplain Access Road (E5), (F5)		Access road installation @ C5	Access road installation @ C5	Access road installation @ C5	Access road installation @ C5	Access road installation @ C5	
Well Installation	--	--	No planned well activities	No planned well activities	No planned well activities	No planned well activities	No planned well activities
IM3 Brine Tank Upgrade (E5)							
Primary Planned Activities	**5/26/2019**	**5/27/2019**	**5/28/2019**	**5/29/2019**	**5/30/2019**	**5/31/2019**	**6/1/2019**
Start Time (PST)	7:00 AM	Memorial Day Holiday No Planned Activities	7:00 AM	7:00 AM	7:00 AM	7:00 AM	7:00 AM
Pipeline C Installation E5, F5			Pipeline installation @ C8, pull box installation @ C3, C4, C5	Pipeline installation @ C8, pull box installation @ C3, C4, C5	Pipeline installation @ C8, pull box installation @ C3, C4, C5	Pipeline installation @ C8, pull box installation @ C3, C4, C5	Pipeline installation @ C8, pull box installation @ C3, C4, C5
Floodplain Access Road (E5), (F5)			Access road installation @ C5	Access road installation @ C5	Access road installation @ C5	Access road installation @ C5	Access road installation @ C5
Well Installation	--		MW-O (E5), MW-S (G5), IRZ-21 (E5)	MW-O (E5), MW-S (G5), IRZ-21 (E5)	MW-O (E5), MW-S (G5), IRZ-21 (E5)	MW-O (E5), MW-S (G5), IRZ-21 (E5)	MW-O (E5), MW-S (G5), IRZ-21 (E5)
IM3 Brine Tank Upgrade (E5)							
Primary Planned Activities	**6/2/2019**	**6/3/2019**	**6/4/2019**	**6/5/2019**	**6/6/2019**	**6/7/2019**	**6/8/2019**
Start Time (PST)	7:00 AM	7:00 AM	7:00 AM	7:00 AM	7:00 AM	7:00 AM	7:00 AM
Pipeline C Installation E5, F5		Hydrostatic testing @ C8, Pipeline install prep @ C6, Pull box installation @ C3, C4, C5	Hydrostatic testing @ C8, Pipeline install prep @ C6, Pull box installation @ C3, C4, C5	Hydrostatic testing @ C8, Pipeline install prep @ C6, Pull box installation @ C3, C4, C5	Hydrostatic testing @ C8, Pipeline install prep @ C6, Pull box installation @ C3, C4, C5	Hydrostatic testing @ C8, Pipeline install prep @ C6, Pull box installation @ C3, C4, C5	
Floodplain Access Road (E5), (F5)		Access road installation @ C4	Access road installation @ C4	Access road installation @ C4	Access road installation @ C4	Access road installation @ C4	
Well Installation	MW-O (E5), MW-S (G5), IRZ-21 (E5)	MW-O (E5), MW-S (G5), IRZ-21 (E5)	RB-2 (E5), MW-S (G5), IRZ-21 (E5)	RB-2 (E5), MW-S (G5), IRZ-23 (F5)	RB-2 (E5), MW-S (G5), IRZ-23 (F5)	--	--
IM3 Brine Tank Upgrade (E5)							
Primary Planned Activities	**6/9/2019**	**6/10/2019**	**6/11/2019**	**6/12/2019**	**6/13/2019**	**6/14/2019**	**6/15/2019**
Start Time (PST)	7:00 AM	7:00 AM	7:00 AM	7:00 AM	7:00 AM	7:00 AM	7:00 AM
Pipeline C Installation E5, F5		--	Concrete encasement install @ C8, Pipeline install @C6	Concrete encasement install @ C8, Pipeline install @C6	Concrete encasement install @ C8, Pipeline install @C6	Concrete encasement install @ C8, Pipeline install @C6	Concrete encasement install @ C8, Pipeline install @C6
Floodplain Access Road (F5)		--	Access road installation @ C3	Access road installation @ C3	Access road installation @ C3	Access road installation @ C3	Access road installation @ C3
Well Installation	--	--	RB-2 (E5), MW-S (G5), IRZ-23 (F5), IRZ-37 (F5), MW-X site prep (E6)	RB-2 (E5), MW-S (G5), IRZ-23 (F5), IRZ-37 (F5), MW-X site prep (E6), MW-C site prep (E5)	RB-2 (E5), MW-S (G5), IRZ-23 (F5), IRZ-37 (F5), MW-X site prep (E6), MW-C site prep (E5)	RB-2 (E5), IRZ-23 (F5), IRZ-37 (F5), MW-X site prep (E6), MW-C site prep (E5)	RB-2 (E5), IRZ-23 (F5), IRZ-37 (F5), MW-X site prep (E6), MW-C site prep (E5)
IM3 Brine Tank Upgrade (E5)							

NOTES
Tasks shown tentative are pending contracting or ERTC and may be rescheduled, PG&E to notify of changes as soon as additional information is available.
The timing of field activities are estimated and may change day-to-day based on site conditions, field progress, or other factors.
When planning to visit the site to observe a specific activity or area, please contact Curt Russell (760-791-5884) for the latest schedule information.
"G5" - Intrusive work location as described on the project grid map. See Project Grid Map tab for location of grid positions provided on the lookahead

Attachment G
Available Groundwater Monitoring Data
(DTSC Condition of Approval xi)

Attachment G. Available Groundwater Monitoring Data

Pursuant to Condition of Approval # xi in DTSC's approval letter dated August 24, 2018 (DTSC, 2018a), PG&E is required to report data from samples collected as part of the sitewide groundwater monitoring program within 60 days of sample collection. In compliance with this requirement, PG&E initially submitted validated data to DTSC via monthly emails. For ease of recordkeeping and to minimize the number of ad-hoc compliance reports/emails, PG&E has since included validated data in each monthly progress report starting with the November 2018 report.

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BCW 2019-03 Sampling

Location ID	Sample ID	Sample Type	Sample Method	Parent Sample ID	Matrix	Field Comment	Date Sampled	ASSET Alkalinity, total as CaCO3 SM 2320 B mg/L	ASSET Antimony, dissolved SW 6020 ug/L	ASSET Arsenic, dissolved SW 6020 ug/L	ASSET Barium, dissolved SW 6020 ug/L	ASSET Beryllium, dissolved SW 6020 ug/L	ASSET Boron, dissolved SW 6010B mg/L	ASSET Bromide EPA 300.0 mg/L	ASSET Cadmium, dissolved SW 6020 ug/L	ASSET Calcium, dissolved SW 6010B mg/L	ASSET Chloride EPA 300.0 mg/L	ASSET Chromium, Hexavalent EPA 218.6 ug/L
MW-09	MW-09-Q119	N	LF		GW		3/18/2019	130		1.8			0.79 J	ND (1.0)		120	720	140
MW-10	MW-10-Q119	N	LF		GW		3/18/2019	120	ND (0.5)	2.4	47	ND (0.5)	0.95	ND (1.0)	ND (0.5)	130	660	150
MW-10	MW-922-Q119	FD		MW-10-Q119	GW		3/18/2019	130	ND (0.5)	2.5	48	ND (0.5)	0.96	ND (1.0)	ND (0.5)	130	660	150
MW-11	MW-11-Q119	N	LF		GW		3/18/2019	96		1.5			0.47	ND (1.0)		140	540	42

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BCW 2019-03 Sampling

Location ID	Sample ID	Sample Type	Sample Method	Parent Sample ID	Matrix	Field Comment	Date Sampled	ASSET Chromium, total dissolved SW 6020 ug/L	ASSET Cobalt, dissolved SW 6020 ug/L	ASSET Copper, dissolved SW 6020 ug/L	ASSET Iron, dissolved SW 6010B ug/L	ASSET Lead, dissolved SW 6020 ug/L	ASSET Magnesium, dissolved SW 6010B mg/L	ASSET Manganese, dissolved SW 6020 ug/L	ASSET Mercury, dissolved EPA 7470A ug/L	ASSET Molybdenum, dissolved SW 6020 ug/L	ASSET Nickel, dissolved SW 6020 ug/L	ASSET Nitrate/Nitrite as Nitrogen SM 4500-NO3 F mg/L
MW-09	MW-09-Q119	N	LF		GW		3/18/2019	130			43		28	ND (0.5)		3.6		12
MW-10	MW-10-Q119	N	LF		GW		3/18/2019	140	ND (0.5)	ND (1.0)	110 J	ND (1.0)	18	5.1	ND (0.2)	19	2.7	12
MW-10	MW-922-Q119	FD		MW-10-Q119	GW		3/18/2019	140	ND (0.5)	ND (1.0)	64 J	ND (1.0)	18	4.4	ND (0.2)	20	2.9	12
MW-11	MW-11-Q119	N	LF		GW		3/18/2019	43			62		21	0.68		5.8		5.6

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BCW 2019-03 Sampling

Location ID	Sample ID	Sample Type	Sample Method	Parent Sample ID	Matrix	Field Comment	Date Sampled	ASSET Selenium, dissolved SW 6020 ug/L	ASSET Silver, dissolved SW 6020 ug/L	ASSET Sodium, dissolved SW 6010B mg/L	ASSET Specific conductance EPA 120.1 uS/cm	ASSET Sulfate EPA 300.0 mg/L	ASSET Thallium, dissolved SW 6020 ug/L	ASSET Total dissolved solids SM 2540 C mg/L	ASSET Vanadium, dissolved SW 6020 ug/L	ASSET Zinc, dissolved SW 6020 ug/L
MW-09	MW-09-Q119	N	LF		GW		3/18/2019	5.7		470	2,700	240		1,800 J		
MW-10	MW-10-Q119	N	LF		GW		3/18/2019	7.2	ND (0.5)	460	2,500	270	ND (0.5)	1,700	17	ND (10)
MW-10	MW-922-Q119	FD		MW-10-Q119	GW		3/18/2019	6.7	ND (0.5)	480	2,600	270	ND (0.5)	1,700	17	ND (10)
MW-11	MW-11-Q119	N	LF		GW		3/18/2019	5.5		290	2,100	180		1,400		

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PMP 2019-03 Sampling

Location ID	Sample ID	Sample Type	Sample Method	Matrix	Field Comment	Date Sampled	ASSET Alkalinity, total as CaCO3 SM 2320 B mg/L	ASSET Calcium, dissolved EPA 200.7 mg/L	ASSET Chloride EPA 300.0 mg/L	ASSET Chromium, Hexavalent EPA 218.6 ug/L	ASSET Chromium, total dissolved EPA 200.8 ug/L	ASSET Iron, dissolved EPA 200.7 ug/L	ASSET Magnesium, dissolved EPA 200.7 mg/L	ASSET Manganese, dissolved EPA 200.8 ug/L	ASSET Nitrate/Nitrite as Nitrogen SM 4500-NO3 F mg/L	ASSET pH SM 4500-H+ B PHUNITS	ASSET Sodium, dissolved EPA 200.7 mg/L	ASSET Specific conductance EPA 120.1 uS/cm	ASSET Sulfate EPA 300.0 mg/L	ASSET Total dissolved solids SM 2540 C mg/L
PE-01	PE-01-0319	N	Tap	GW		3/5/2019	250	160	870	ND (0.2)	ND (1.0)	ND (20)	40 J	860	ND (0.05)	7.6	640	3,500	320	2,200
TW-03D	TW-03D-0319	N	Tap	GW		3/5/2019	160	190	2,100	500	520	ND (20)	27	21	2.9	7.3	1,400	7,400	510	4,500

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RMP 2019-03 SURFACEWAT Sampling

Location ID	Sample ID	Sample Type	Sample Method	Parent Sample ID	Matrix	Date Sampled	ASSET Arsenic, dissolved SW 6020 ug/L	ASSET Barium, dissolved SW 6020 ug/L	ASSET Chromium, Hexavalent EPA 218.6 ug/L	ASSET Chromium, total dissolved SW 6020 ug/L	ASSET Iron SW 6010B ug/L	ASSET Iron, dissolved SW 6010B ug/L	ASSET Manganese, dissolved SW 6020 ug/L	ASSET Molybdenum, dissolved SW 6020 ug/L	ASSET Nitrate/Nitrite as Nitrogen SM 4500-NO3 F mg/L	ASSET pH SM 4500-H+ B PHUNITS	ASSET Selenium, dissolved SW 6020 ug/L	ASSET Specific conductance EPA 120.1 uS/cm	ASSET Total Suspended Solids (TSS) SM 2540 D mg/L
C-BNS	C-BNS-0319	N	R		Surfacewater	3/19/2019	2.2	110	ND (0.2)	ND (1.0)	ND (20)	ND (20)	ND (0.5)	5.2	0.42	8.2	1.4	820	ND (5.0)
C-CON-D	C-CON-D-0319	N	R		Surfacewater	3/20/2019	2.5	110	ND (0.2)	ND (1.0)	43	ND (20)	ND (0.5)	5.1	0.41	8.0	1.9	920	ND (5.0)
C-CON-D	MW-911-Q119	FD		C-CON-D-0319	Surfacewater	3/20/2019	2.1	100	ND (0.2)	ND (1.0)	55	ND (20)	ND (0.5)	4.9	0.41	8.1	1.6	900	ND (5.0)
C-CON-S	C-CON-S-0319	N	R		Surfacewater	3/20/2019	2.3	110	ND (0.2)	ND (1.0)	67	ND (20)	ND (0.5)	4.9	0.4	8.1	1.6	910	ND (5.0)
C-I-3-D	C-I-3-D-0319	N	R		Surfacewater	3/19/2019	2.4	110	ND (0.2)	ND (1.0)	82	22	ND (0.5)	5.6	0.4	8.2	1.9	820	ND (5.0)
C-I-3-S	C-I-3-S-0319	N	R		Surfacewater	3/19/2019	2.2	110	ND (0.2)	ND (1.0)	ND (20)	ND (20)	ND (0.5)	5.2	0.41	8.2	2.1	810	ND (5.0)
C-I-3-S	MW-909-Q119	FD		C-I-3-S-0319	Surfacewater	3/19/2019	2.2	120	ND (0.2)	ND (1.0)	ND (20)	ND (20)	ND (0.5)	5.6	0.4	8.2	2.4	810	ND (5.0)
C-MAR-D	C-MAR-D-0319	N	R		Surfacewater	3/20/2019	2.2	110	ND (0.2)	ND (1.0)	100	26	ND (0.5)	5.0	0.82	8.2	1.9	900	ND (5.0)
C-MAR-S	C-MAR-S-0319	N	R		Surfacewater	3/20/2019	2.2	100	ND (0.2)	ND (1.0)	150	ND (20)	ND (0.5)	4.5	0.39	8.2	1.7	910	8.5
C-NR1-D	C-NR1-D-0319	N	R		Surfacewater	3/20/2019	2.0	110	ND (0.2)	ND (1.0)	34	ND (20)	ND (0.5)	4.6	0.39	8.1	1.7	910	ND (5.0)
C-NR1-S	C-NR1-S-0319	N			Surfacewater	3/20/2019	2.1	110	ND (0.2)	ND (1.0)	110	ND (20)	ND (0.5)	4.7	0.39	8.1	2.3	910	ND (5.0)
C-NR3-D	C-NR3-D-0319	N	R		Surfacewater	3/20/2019	2.1	100	ND (0.2)	ND (1.0)	39	31	ND (0.5)	4.7	0.4	8.1	1.4	910	ND (5.0)
C-NR3-S	C-NR3-S-0319	N	R		Surfacewater	3/20/2019	2.2	110	ND (0.2)	ND (1.0)	26	23	ND (0.5)	4.8	0.4	8.1	1.4	910	ND (5.0)
C-NR4-D	C-NR4-D-0319	N	R		Surfacewater	3/20/2019	2.1	100	ND (0.2)	ND (1.0)	33	ND (20)	ND (0.5)	4.5	0.4	8.1	1.6	920	ND (5.0)
C-NR4-S	C-NR4-S-0319	N	R		Surfacewater	3/20/2019	2.3	100	ND (0.2)	ND (1.0)	26	ND (20)	ND (0.5)	4.7	0.4	8.1	1.6	920	ND (5.0)
C-R22A-D	C-R22A-D-0319	N	R		Surfacewater	3/19/2019	2.2	110	ND (0.2)	ND (1.0)	ND (20)	ND (20)	ND (0.5)	5.3	0.37	8.2	1.9	820	ND (5.0)
C-R22A-D	MW-910-Q119	FD		C-R22A-D-0319	Surfacewater	3/19/2019	2.3	120	ND (0.2)	ND (1.0)	23	ND (20)	ND (0.5)	5.2	0.38	8.3	1.3	830	ND (5.0)
C-R22A-S	C-R22A-S-0319	N	R		Surfacewater	3/19/2019	2.4	120	ND (0.2)	ND (1.0)	20	ND (20)	ND (0.5)	5.4	0.41	8.3	1.7	820	ND (5.0)
C-R27-D	C-R27-D-0319	N	R		Surfacewater	3/19/2019	2.2	110	ND (0.2)	ND (1.0)	45	25	ND (0.5)	5.1	0.4	8.2	1.5	820	ND (5.0)
C-R27-S	C-R27-S-0319	N	R		Surfacewater	3/19/2019	2.2	110	ND (0.2)	ND (1.0)	25	ND (20)	ND (0.5)	4.8	0.36	8.2	1.8	820	ND (5.0)
C-TAZ-D	C-TAZ-D-0319	N	R		Surfacewater	3/19/2019	2.2	110	ND (0.2)	ND (1.0)	31	ND (20)	ND (0.5)	4.9	0.41	8.3	1.3	810	ND (5.0)
C-TAZ-S	C-TAZ-S-0319	N	R		Surfacewater	3/19/2019	2.3	110	ND (0.2)	ND (1.0)	ND (20)	ND (20)	ND (0.5)	5.3	0.39	8.2	2.1	820	ND (5.0)
R-19	R-19-0319	N	R		Surfacewater	3/20/2019	2.3	100	ND (0.2)	1.7	58	ND (20)	ND (0.5)	4.7	0.41	8.2	1.8	920	ND (5.0)
R-28	R-28-0319	N			Surfacewater	3/19/2019	2.1	110	ND (0.2)	ND (1.0)	ND (20)	ND (20)	ND (0.5)	5.3	0.38	8.2	2.0	820	ND (5.0)
R63	R63-0319	N	R		Surfacewater	3/19/2019	2.2	110	ND (0.2)	ND (1.0)	ND (20)	ND (20)	ND (0.5)	5.1	0.36	8.3	1.9	820	ND (5.0)
RRB	RRB-0319	N	R		Surfacewater	3/20/2019	2.2	100	ND (0.2)	ND (1.0)	44	ND (20)	ND (0.5)	4.4	0.36	8.1	1.4	940	ND (5.0)
SW1	SW1-0319	N	G		Surfacewater	3/19/2019			ND (0.2)	ND (1.0)						7.5		920	
SW2	SW2-0319	N	G		Surfacewater	3/19/2019			ND (0.2)	ND (1.0)						7.4		890	

ARCADIS Design & Consultancy for natural and built assets

TMP 2019-03 Sampling

Location ID	Sample ID	Sample Type	Sample Method	Parent Sample ID	Matrix	Date Sampled	ASSET Alkalinity, total as CaCO3 SM 2320 B mg/L	ASSET Aluminum SW 6010B ug/L	ASSET Aluminum, dissolved SW 6010B ug/L	ASSET Antimony SW 6020 ug/L	ASSET Antimony, dissolved SW 6020 ug/L	ASSET Arsenic SW 6020 ug/L	ASSET Arsenic, dissolved SW 6020 ug/L	ASSET Barium SW 6020 ug/L	ASSET Barium, dissolved SW 6020 ug/L	ASSET Beryllium SW 6020 ug/L	ASSET Beryllium, dissolved SW 6020 ug/L
MW-B-117	MW-B-117-033019	N			GW	3/30/2019											
MW-B-33	MW-B-33-033119	N			GW	3/31/2019											
MW-E-142	MW-E-142-3V-0319	N	3V		GW	3/20/2019	90	ND (50)	ND (50)	ND (0.5)	ND (0.5)	3.8	3.8	37	34	ND (2.5)	ND (2.5)
MW-E-142	MW-E-142-LF-0319	N	LF		GW	3/20/2019	92	320	ND (50)	ND (0.5)	ND (0.5)	4.2	3.4	44	35	ND (2.5)	ND (2.5)
MW-E-72	MW-E-72-3V-0319	N	3V		GW	3/20/2019	100	ND (50)	ND (50)	ND (0.5)	ND (0.5)	1.3	1.2	35	34	ND (0.5)	ND (0.5)
MW-E-72	MW-E-72-LF-0319	N	LF		GW	3/20/2019	110	150	ND (50)	ND (0.5)	ND (0.5)	1.4	1.2	36	33	ND (0.5)	ND (0.5)
MW-F-104	MW-F-104-022719	N			GW	2/27/2019											
MW-F-104	MW-F-104-0319	N	LF		GW	3/19/2019	130	1,400	110	ND (0.5)	ND (0.5)	29	29	100	98	ND (0.5)	ND (0.5)
MW-F-104	MW-920-0319	FD		MW-F-104-0319	GW	3/19/2019	130	1,000	170	ND (0.5)	ND (0.5)	27	27	100	96	ND (0.5)	ND (0.5)
MW-F-60	MW-F-60-022819	N			GW	2/28/2019											
MW-F-60	MW-F-60-0319	N	LF		GW	3/19/2019	110	610	ND (50)	ND (0.5)	ND (0.5)	5.0	4.9	110	110	ND (0.5)	ND (0.5)
MW-G-57	MW-G-57-030219	N			GW	3/2/2019											
MW-G-59	MW-G-59-0319	N	LF		GW	3/19/2019	120	68	ND (50)	ND (0.5)	ND (0.5)	3.0	2.9	65	66	ND (0.5)	ND (0.5)
MW-G-82	MW-G-82-030219	N			GW	3/2/2019											
MW-G-84	MW-G-84-0319	N	LF		GW	3/19/2019	99	170	ND (50)	0.5	ND (0.5)	3.8	3.3	58	53	ND (0.5)	ND (0.5)
MW-L-180	MW-L-180-032819	N			GW	3/28/2019											
MW-L-225	MW-L-225-032919	N			GW	3/29/2019											
MW-L-245	MW-L-245-030319	N			GW	3/3/2019											
MW-L-245	MW-L-245-0319	N	LF		GW	3/19/2019	48	690	57	ND (0.5)	ND (0.5)	9.2	9.1	160	160	ND (2.5)	ND (2.5)
MW-L-90	MW-L-90-032919	N			GW	3/29/2019											

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Location ID	Sample ID	Sample Type	Sample Method	Parent Sample ID	Matrix	Date Sampled	ASSET Boron SW 6010B ug/L	ASSET Boron, dissolved SW 6010B mg/L	ASSET Bromide EPA 300.0 mg/L	ASSET Cadmium SW 6020 ug/L	ASSET Cadmium, dissolved SW 6020 ug/L	ASSET Calcium SW 6010B ug/L	ASSET Calcium, dissolved SW 6010B mg/L	ASSET Chloride EPA 300.0 mg/L	ASSET Chromium, Hexavalent EPA 218.6 ug/L	ASSET Chromium, total SW 6020 ug/L	ASSET Chromium, total dissolved SW 6020 ug/L
MW-B-117	MW-B-117-033019	N			GW	3/30/2019									ND (1.0)		ND (1.0)
MW-B-33	MW-B-33-033119	N			GW	3/31/2019									2.3		3.7
MW-E-142	MW-E-142-3V-0319	N	3V		GW	3/20/2019	2,500	2.3	ND (5.0)	ND (0.5)	ND (0.5)	400,000	360	3,900	6,800	6,900	6,700
MW-E-142	MW-E-142-LF-0319	N	LF		GW	3/20/2019	2,300	2.3	ND (5.0)	ND (0.5)	ND (0.5)	360,000	360	3,800	7,000	7,400	7,200
MW-E-72	MW-E-72-3V-0319	N	3V		GW	3/20/2019	770	0.77	ND (2.5)	ND (0.5)	ND (0.5)	140,000	140	500	3,900	4,300	4,200
MW-E-72	MW-E-72-LF-0319	N	LF		GW	3/20/2019	700	0.72	ND (2.5)	ND (0.5)	ND (0.5)	140,000	140	500	4,000	4,600	4,100
MW-F-104	MW-F-104-022719	N			GW	2/27/2019									1,700		1,800
MW-F-104	MW-F-104-0319	N	LF		GW	3/19/2019	790	0.75	ND (1.0)	ND (0.5)	ND (0.5)	33,000	33	330	260	250	270
MW-F-104	MW-920-0319	FD		MW-F-104-0319	GW	3/19/2019	790	0.75	ND (1.0)	ND (0.5)	ND (0.5)	32,000	33	350	270	240	270
MW-F-60	MW-F-60-022819	N			GW	2/28/2019									2,200		2,300
MW-F-60	MW-F-60-0319	N	LF		GW	3/19/2019	530	0.52	ND (0.5)	ND (0.5)	ND (0.5)	45,000	50	250	2.5	12	3.9
MW-G-57	MW-G-57-030219	N			GW	3/2/2019									560		510
MW-G-59	MW-G-59-0319	N	LF		GW	3/19/2019	960	0.92	1.4	ND (0.5)	ND (0.5)	110,000	110	1,300	270	260	260
MW-G-82	MW-G-82-030219	N			GW	3/2/2019									1,500		1,500
MW-G-84	MW-G-84-0319	N	LF		GW	3/19/2019	1,200	1.1	ND (2.5)	ND (0.5)	ND (0.5)	290,000	280	2,700	1,600	1,700	1,500
MW-L-180	MW-L-180-032819	N			GW	3/28/2019									ND (1.0)		ND (1.0)
MW-L-225	MW-L-225-032919	N			GW	3/29/2019									380		410
MW-L-245	MW-L-245-030319	N			GW	3/3/2019									15		14
MW-L-245	MW-L-245-0319	N	LF		GW	3/19/2019	2,300	2.2	ND (2.5)	ND (0.5)	ND (0.5)	480,000	470	6,700	3.6	5.8	3.8
MW-L-90	MW-L-90-032919	N			GW	3/29/2019									18		19

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Location ID	Sample ID	Sample Type	Sample Method	Parent Sample ID	Matrix	Date Sampled	ASSET Cobalt SW 6020 ug/L	ASSET Cobalt, dissolved SW 6020 ug/L	ASSET Copper SW 6020 ug/L	ASSET Copper, dissolved SW 6020 ug/L	ASSET Fluoride EPA 300.0 mg/L	ASSET Iron SW 6010B ug/L	ASSET Iron, dissolved SW 6010B ug/L	ASSET Lead SW 6020 ug/L	ASSET Lead, dissolved SW 6020 ug/L	ASSET Magnesium SW 6010B ug/L	ASSET Magnesium, dissolved SW 6010B mg/L
MW-B-117	MW-B-117-033019	N			GW	3/30/2019											
MW-B-33	MW-B-33-033119	N			GW	3/31/2019											
MW-E-142	MW-E-142-3V-0319	N	3V		GW	3/20/2019	ND (0.5)	ND (0.5)	ND (1.0)	ND (1.0)	3.0	27	ND (20)	ND (1.0)	ND (1.0)	17,000	16
MW-E-142	MW-E-142-LF-0319	N	LF		GW	3/20/2019	ND (0.5)	ND (0.5)	ND (1.0)	ND (1.0)	2.5	550	21	ND (1.0)	ND (1.0)	16,000	16
MW-E-72	MW-E-72-3V-0319	N	3V		GW	3/20/2019	ND (0.5)	ND (0.5)	ND (1.0)	ND (1.0)	1.6	ND (20)	ND (20)	ND (1.0)	ND (1.0)	22,000	23
MW-E-72	MW-E-72-LF-0319	N	LF		GW	3/20/2019	ND (0.5)	ND (0.5)	ND (1.0)	ND (1.0)	1.6	140	26	ND (1.0)	ND (1.0)	22,000	22
MW-F-104	MW-F-104-022719	N			GW	2/27/2019											
MW-F-104	MW-F-104-0319	N	LF		GW	3/19/2019	ND (0.5)	ND (0.5)	ND (1.0)	ND (1.0)	2.6	980	98	ND (1.0)	ND (1.0)	3,600	3.2
MW-F-104	MW-920-0319	FD		MW-F-104-0319	GW	3/19/2019	ND (0.5)	ND (0.5)	ND (1.0)	ND (1.0)	2.6	740	160	ND (1.0)	ND (1.0)	3,500	3.3
MW-F-60	MW-F-60-022819	N			GW	2/28/2019											
MW-F-60	MW-F-60-0319	N	LF		GW	3/19/2019	ND (0.5)	ND (0.5)	ND (1.0)	ND (1.0)	1.4	480	54	ND (1.0)	ND (1.0)	8,600	8.9
MW-G-57	MW-G-57-030219	N			GW	3/2/2019											
MW-G-59	MW-G-59-0319	N	LF		GW	3/19/2019	ND (0.5)	ND (0.5)	ND (1.0)	ND (1.0)	3.2	140	ND (20)	ND (1.0)	ND (1.0)	21,000	20
MW-G-82	MW-G-82-030219	N			GW	3/2/2019											
MW-G-84	MW-G-84-0319	N	LF		GW	3/19/2019	ND (0.5)	ND (0.5)	ND (1.0)	ND (1.0)	2.2	280	61	ND (1.0)	ND (1.0)	23,000	21
MW-L-180	MW-L-180-032819	N			GW	3/28/2019											
MW-L-225	MW-L-225-032919	N			GW	3/29/2019											
MW-L-245	MW-L-245-030319	N			GW	3/3/2019											
MW-L-245	MW-L-245-0319	N	LF		GW	3/19/2019	ND (0.5)	ND (0.5)	ND (1.0)	ND (1.0)	3.9	780	35	ND (5.0)	ND (1.0)	6,800	6.6
MW-L-90	MW-L-90-032919	N			GW	3/29/2019											

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Location ID	Sample ID	Sample Type	Sample Method	Parent Sample ID	Matrix	Date Sampled	ASSET Manganese SW 6020 ug/L	ASSET Manganese, dissolved SW 6020 ug/L	ASSET Mercury EPA 7470A ug/L	ASSET Mercury, dissolved EPA 7470A ug/L	ASSET Molybdenum SW 6020 ug/L	ASSET Molybdenum, dissolved SW 6020 ug/L	ASSET Nickel SW 6020 ug/L	ASSET Nickel, dissolved SW 6020 ug/L	ASSET Nitrate/Nitrite as Nitrogen SM 4500-NO3 F mg/L	ASSET Potassium, dissolved SW 6010B mg/L	ASSET Selenium SW 6020 ug/L
MW-B-117	MW-B-117-033019	N			GW	3/30/2019											
MW-B-33	MW-B-33-033119	N			GW	3/31/2019											
MW-E-142	MW-E-142-3V-0319	N	3V		GW	3/20/2019	80	74	ND (0.2)	ND (0.2)	22	22	ND (1.0)	ND (1.0)	8.8	34	25
MW-E-142	MW-E-142-LF-0319	N	LF		GW	3/20/2019	83	70	ND (0.2)	ND (0.2)	22	22	3.1	ND (1.0)	8.6	34	25
MW-E-72	MW-E-72-3V-0319	N	3V		GW	3/20/2019	ND (0.5)	ND (0.5)	ND (0.2)	ND (0.2)	6.6	6.4	ND (1.0)	ND (1.0)	12	9.5	10
MW-E-72	MW-E-72-LF-0319	N	LF		GW	3/20/2019	5.7	1.5	ND (0.2)	0.44	7.5	7.0	4.0	1.8	12	9.3	10
MW-F-104	MW-F-104-022719	N			GW	2/27/2019											
MW-F-104	MW-F-104-0319	N	LF		GW	3/19/2019	170	160	ND (0.2)	ND (0.2)	110	110	1.9	1.1	2.0	8.1	10
MW-F-104	MW-920-0319	FD		MW-F-104-0319	GW	3/19/2019	170	150	ND (0.2)	ND (0.2)	100	100	1.9	1.2	2.0	8.4	9.2
MW-F-60	MW-F-60-022819	N			GW	2/28/2019											
MW-F-60	MW-F-60-0319	N	LF		GW	3/19/2019	210	220	ND (0.2)	ND (0.2)	38	43	1.1	ND (1.0)	1.4	8.6	3.4
MW-G-57	MW-G-57-030219	N			GW	3/2/2019											
MW-G-59	MW-G-59-0319	N	LF		GW	3/19/2019	160	150	ND (0.2)	ND (0.2)	51	51	1.2	ND (1.0)	10	19	23
MW-G-82	MW-G-82-030219	N			GW	3/2/2019											
MW-G-84	MW-G-84-0319	N	LF		GW	3/19/2019	70	56	ND (0.2)	ND (0.2)	18	18	5.1	2.0	9.8	24	8.7
MW-L-180	MW-L-180-032819	N			GW	3/28/2019											
MW-L-225	MW-L-225-032919	N			GW	3/29/2019											
MW-L-245	MW-L-245-030319	N			GW	3/3/2019											
MW-L-245	MW-L-245-0319	N	LF		GW	3/19/2019	32	17	ND (0.2)	ND (0.2)	68	71	ND (1.0)	ND (1.0)	0.15	46	ND (0.5)
MW-L-90	MW-L-90-032919	N			GW	3/29/2019											

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Location ID	Sample ID	Sample Type	Sample Method	Parent Sample ID	Matrix	Date Sampled	ASSET Selenium, dissolved SW 6020 ug/L	ASSET Silver SW 6020 ug/L	ASSET Silver, dissolved SW 6020 ug/L	ASSET Sodium, dissolved SW 6010B mg/L	ASSET Sulfate EPA 300.0 mg/L	ASSET Thallium SW 6020 ug/L	ASSET Thallium, dissolved SW 6020 ug/L	ASSET Total dissolved solids SM 2540 C mg/L	ASSET Total organic carbon SM 5310 C mg/L	ASSET Vanadium SW 6020 ug/L	ASSET Vanadium, dissolved SW 6020 ug/L
MW-B-117	MW-B-117-033019	N			GW	3/30/2019											
MW-B-33	MW-B-33-033119	N			GW	3/31/2019											
MW-E-142	MW-E-142-3V-0319	N	3V		GW	3/20/2019	22	ND (0.5)	ND (0.5)	2,600	940	ND (0.5)	ND (0.5)	7,400	ND (1.0)	1.9	1.8
MW-E-142	MW-E-142-LF-0319	N	LF		GW	3/20/2019	21	ND (0.5)	ND (0.5)	2,500	920	ND (0.5)	ND (0.5)	7,500	ND (1.0)	2.7	1.6
MW-E-72	MW-E-72-3V-0319	N	3V		GW	3/20/2019	10	ND (0.5)	ND (0.5)	380	320	ND (0.5)	ND (0.5)	1,500	ND (1.0)	5.2	5.3
MW-E-72	MW-E-72-LF-0319	N	LF		GW	3/20/2019	11	ND (0.5)	ND (0.5)	380	330	ND (0.5)	ND (0.5)	1,500	ND (1.0)	5.6	4.8
MW-F-104	MW-F-104-022719	N			GW	2/27/2019											
MW-F-104	MW-F-104-0319	N	LF		GW	3/19/2019	10	ND (0.5)	ND (0.5)	330	180	ND (0.5)	ND (0.5)	910	1.2	7.2	5.9
MW-F-104	MW-920-0319	FD		MW-F-104-0319	GW	3/19/2019	12	ND (0.5)	ND (0.5)	350	180	ND (0.5)	ND (0.5)	1,000	ND (10)	7.4	5.8
MW-F-60	MW-F-60-022819	N			GW	2/28/2019											
MW-F-60	MW-F-60-0319	N	LF		GW	3/19/2019	3.1	ND (0.5)	ND (0.5)	270	230	ND (0.5)	ND (0.5)	910	2.5	ND (1.0)	ND (1.0)
MW-G-57	MW-G-57-030219	N			GW	3/2/2019											
MW-G-59	MW-G-59-0319	N	LF		GW	3/19/2019	24	ND (0.5)	ND (0.5)	1,100	530	ND (0.5)	ND (0.5)	3,000	ND (1.0)	2.5	1.8
MW-G-82	MW-G-82-030219	N			GW	3/2/2019											
MW-G-84	MW-G-84-0319	N	LF		GW	3/19/2019	9.0	ND (0.5)	ND (0.5)	1,700	520	ND (0.5)	ND (0.5)	5,200	ND (1.0)	1.8	ND (1.0)
MW-L-180	MW-L-180-032819	N			GW	3/28/2019											
MW-L-225	MW-L-225-032919	N			GW	3/29/2019											
MW-L-245	MW-L-245-030319	N			GW	3/3/2019											
MW-L-245	MW-L-245-0319	N	LF		GW	3/19/2019	ND (2.5)	ND (0.5)	ND (0.5)	4,200	640	ND (2.5)	ND (0.5)	11,000	ND (1.0)	8.4	6.8
MW-L-90	MW-L-90-032919	N			GW	3/29/2019											

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Location ID	Sample ID	Sample Type	Sample Method	Parent Sample ID	Matrix	Date Sampled	ASSET Zinc SW 6020 ug/L	ASSET Zinc, dissolved SW 6020 ug/L	BCLabs Ammonia as nitrogen SM 4500-NH3 G mg/L
MW-B-117	MW-B-117-033019	N			GW	3/30/2019			
MW-B-33	MW-B-33-033119	N			GW	3/31/2019			
MW-E-142	MW-E-142-3V-0319	N	3V		GW	3/20/2019	ND (10)	ND (10)	ND (0.2)
MW-E-142	MW-E-142-LF-0319	N	LF		GW	3/20/2019	ND (10)	ND (10)	ND (0.2)
MW-E-72	MW-E-72-3V-0319	N	3V		GW	3/20/2019	ND (10)	ND (10)	ND (0.2)
MW-E-72	MW-E-72-LF-0319	N	LF		GW	3/20/2019	ND (10)	ND (10)	ND (0.2)
MW-F-104	MW-F-104-022719	N			GW	2/27/2019			
MW-F-104	MW-F-104-0319	N	LF		GW	3/19/2019	ND (10)	ND (10)	ND (0.2)
MW-F-104	MW-920-0319	FD		MW-F-104-0319	GW	3/19/2019	ND (10)	ND (10)	ND (0.2)
MW-F-60	MW-F-60-022819	N			GW	2/28/2019			
MW-F-60	MW-F-60-0319	N	LF		GW	3/19/2019	ND (10)	ND (10)	ND (0.2)
MW-G-57	MW-G-57-030219	N			GW	3/2/2019			
MW-G-59	MW-G-59-0319	N	LF		GW	3/19/2019	ND (10)	ND (10)	0.32
MW-G-82	MW-G-82-030219	N			GW	3/2/2019			
MW-G-84	MW-G-84-0319	N	LF		GW	3/19/2019	ND (10)	ND (10)	ND (0.2)
MW-L-180	MW-L-180-032819	N			GW	3/28/2019			
MW-L-225	MW-L-225-032919	N			GW	3/29/2019			
MW-L-245	MW-L-245-030319	N			GW	3/3/2019			
MW-L-245	MW-L-245-0319	N	LF		GW	3/19/2019	17	ND (10)	ND (0.2)
MW-L-90	MW-L-90-032919	N			GW	3/29/2019			