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April 10, 2019

Ms. Pamela Innis
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Subject: **March 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_March 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 February 2019 as well as activities planned for the next six weeks (March 31 through May 11, 2019), and presents available results from sampling and testing performed in March 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: *March 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: 4/10/2019

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 February 2019 and activities planned for the next six weeks (March 31 through May 11, 2019) and presents available results from sampling and testing in March 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:

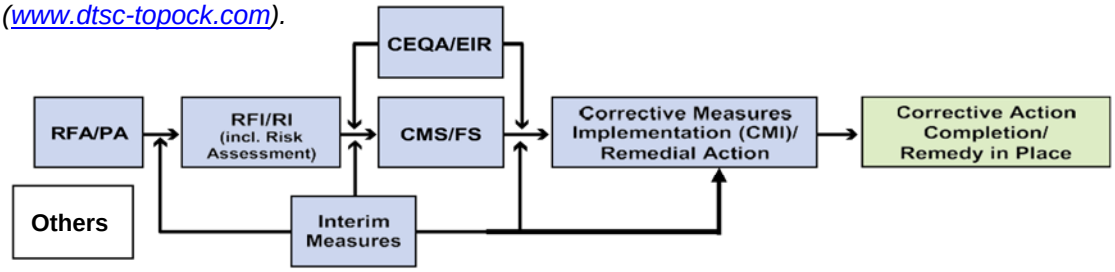
This submittal is required in compliance with the CACA, CD, and pursuant to the C/RAWP.

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

March 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_March 2019

April 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 sixth 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 March 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 March 31, 2019, a total of 37 six-week look-ahead schedule emails have been sent. **Of those, five six-week look-ahead schedule emails were sent in March 2019 (on March 2, 9, 17, 23, and 31, 2019)**.
- On August 10, 2018, PG&E issued the first Environmental Release to Construct (ERTC) to contractors. As of March 29, 2019, a total of 40 ERTCs were issued for mobilization and construction activities (see Table 2-1). **Of those, eight ERTCs were issued in March 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 March 2019, a total of 29 daily construction activities lists were published and discussed at the morning tailboards.**
- In March 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**):
  - **Pipeline/Conduits Installation Activities:**
    a) Grubbed and cleared vegetation along Pipeline C alignment in the floodplain, including in BNSF and Caltrans Right-of-Way (ROWs).
    b) Started to install the 12kV electrical conduits along Pipeline C Segment 5.
    c) Completed potholing to daylight the Frontier telecom line along a portion of National Trails Highway (NTH), that parallels with Pipeline C Segments C13, C15, and C16.
  - **Other Non-Well Construction Activities:**
    a) Completed placement of mats under BNSF ROW prior to the start of bat maternity season on March 15, 2019.
    b) Completed potholing to pre-characterize soil on the MW-20 Bench.
    c) Completed concrete pour at the Brine Tanks containment pad on the MW-20 Bench.
  - **Pilot Boring/Well Installation Activities (Rotosonic drilling):**
    a) Completed drilling pilot borehole at IRZ-17. Backfilled with gravel.
    b) Completed drilling pilot borehole at IRZ-27 to 127 feet on March 20, 2019. Backfilled with gravel.
    c) Completed drilling pilot borehole at IRZ-39 to 54 feet on March 30, 2019. Backfilled with gravel.
    d) Started drilling pilot hole at MW-10D on March 31, 2019.
    e) Completed installation wells at MW-B, N, and W on March 16, 28, and 30, 2019, respectively.

- **Remedy Well Installation Activities (Dual Rotary drilling):**

  f) Started drilling at IRZ-20 on March 30, 2019.

  g) 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) each at IRZ-27, IRZ-29, and MW-M (sampled on March 12, 2019), at IRZ-37, MW-10D,MW-O, MW-W, RB-1 through RB-5 (sampled on March 20, 2019), and at IRZ-39 (sampled on March 29, 2019). In addition, one baseline soil sample (GRBS-15-BOT) was collected at the bottom of Pipeline C, Segment C5 trench on March 29, 2019.
  - 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 March 31, 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 March 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 March 31, 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 C Area 1,
  - Location Maze A Area 2, and
  - Location Maze A, Area 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 March 31, 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-20 with the dual rotary drill rig.
- Continue sonic drilling at MW-M and MW-10D.
- Started site preparation for and access to well RB-5.
- 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 March 31, 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 848,150 gallons of freshwater was used, of which an approximate 2 percent was for pilot boring/well installation and general construction activities and 98 percent was for fugitive dust suppression.
- Approximately 74.2 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 at the SPY.
- 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.
- Approximately 41,415 gallons of wastewater were generated from drilling operations. At each 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. 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 December 18 and 28, 2018. Analytical results indicated that the wastewater is of acceptable quality for disposal at the Compressor Station evaporation pond #4. Approximately 14,050 gallons of wastewater was discharged to pond #4 on February 15-16, 2019.
    – One wastewater frac tank was sampled on February 21, 2019. Analytical results indicated that the wastewater is of acceptable quality for disposal at the Compressor Station evaporation pond #4. Approximately 16,790 gallons of wastewater was discharged to pond #4 on March 14-16, 2019.
- Approximately 138 cubic yards of general construction waste, 72 cubic yards of recyclables, and 163.7 tons of green waste 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 March 31, 2019, a total of 64 health and safety training sessions were held and 263 employees and contractors received the training. **Of those, in March 2019, ten sessions were conducted and 30 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 March 31, 2019, a total of 65 WEAT sessions were conducted and 297 employees and contractors received the training. **Of those, in March 2019, 11 sessions were conducted and 30 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. **Of those, in March 2019, 3 sessions were conducted and 21 employees/contractors were trained.**
- 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

There was no request for work variance in March 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, several 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), PG&E will seek 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.
- 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.
- Results from the recent geotechnical investigation along Pipeline F indicate that significant shoring and installation of a soldier pile is required in order to install the pipeline per design. PG&E is evaluating options to minimize the construction impacts including rerouting Pipeline F along the approved Pipeline J and B.
- On March 11, 2019, PG&E notified DTSC and DOI that on Friday 3/8, a high wind condition occurred at the site. At the MW-N drilling location, the wind speed was recorded at 28+ mph during a noise monitoring event at location MAZE B-Area 1 and 2. The sound barrier at MW-N was observed to sway violently under the high wind condition. PG&E assessed the situation and subsequently closed that portion of the access road to protect the public and workers and monitored the situation over the

weekend. On Monday March 11, 2019, Cascade reported that they were concerned about the health and safety of their crew and anyone who travels on that portion of the access road should a high wind event were to occur at MW-N. Therefore, PG&E plans to remove the sound barrier prior to the restart of drilling at MW-N on March 12, 2019 to protect workers and the public. The sound barrier was removed from the MW-N location on March 11, 2019.

2.1.8 Key Personnel Changes

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

2.2 Communication with the Public

PG&E conducted the following communication with the Public in March 2019:

- In mid-March 2019, PG&E obtained permission from the property owner of the Topock Marina mobile home park for conducting noise monitoring in selected locations if construction activities occurred within 750 feet of the park.

2.3 Planned Activities for Next Six Weeks

The planned activities for next six weeks (March 31 through May 11, 2019) include the following:

- Well installation activities:
  - Complete installation of wells MW-M, MW-10D, MW-U, MW-R, and MW-S.
  - Start work at MW-X and MW-Y'.
  - Complete drilling pilot borehole at RB-3, RB-4, and RB-5.
  - Complete well installation at IRZ-20, IRZ-21, and IRZ-25 using dual rotary rig.
- 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.
  - 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 March 31, 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.

California Department of Toxic Substances Control (DTSC). 2013. *Community Outreach Plan, Pacific Gas and Electric Company's Topock Compressor Station, Needles, California.* http://dtsc-topock.com/sites/default/files/2013-01-11_FinalCOP_Web.pdf. January.

California Department of Toxic Substances Control (DTSC). 2018a. *Acceptance and Conditional Approval of Groundwater Remedy Design and Corrective Measures Implementation Workplan at Pacific Gas and Electric Company, Topock Compressor Station, Needles, California.* April 24.

California Department of Toxic Substances Control (DTSC). 2018b. *Final Subsequent Environmental Impact Report for the Pacific Gas and Electric Company Topock Compressor Station Final Groundwater Remediation Project.* April 24.

CH2M HILL, Inc. (CH2M). 2014. *Final Programmatic Biological Assessment for Pacific Gas and Electric Topock Compressor Station Final Groundwater Remedy*. April 28.

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.

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

United States Department of the Interior (DOI). 2012. *Community Involvement Plan, Pacific Gas and Electric Topock Compressor Station, Needles, California.* http://dtsc-topock.com/sites/default/files/FINAL_DOI_CIP_10-12.pdf. September.

United States Department of the Interior (DOI). 2013. *Remedial Action/Remedial Design Consent Decree (CD) between the United States of America and Pacific Gas & Electric Company.* Case 5:13-cv-00074-BRO-OP, Document 23. Entered November 21.

United States Department of the Interior (DOI). 2018. *Approval of PG&E Topock Compressor Station Remediation Site – Basis of Design Report/Final (100%) Design Submittal and Construction/Remedial Action Work Plan for the Final Groundwater Remedy and the Supplemental and Errata Information for the Final (100%) Design for the Final Groundwater Remedy, PG&E Topock Compressor Station, Needles, California.* Letter from Pamela Innis/DOI to Curt Russell/PG&E. April 3.

Tables

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

March 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

March 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
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
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

Note:
ERTC 8 (Wastewater Management) and ERTC 5o (Installation of MW-X/Y') are under development.

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

March 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

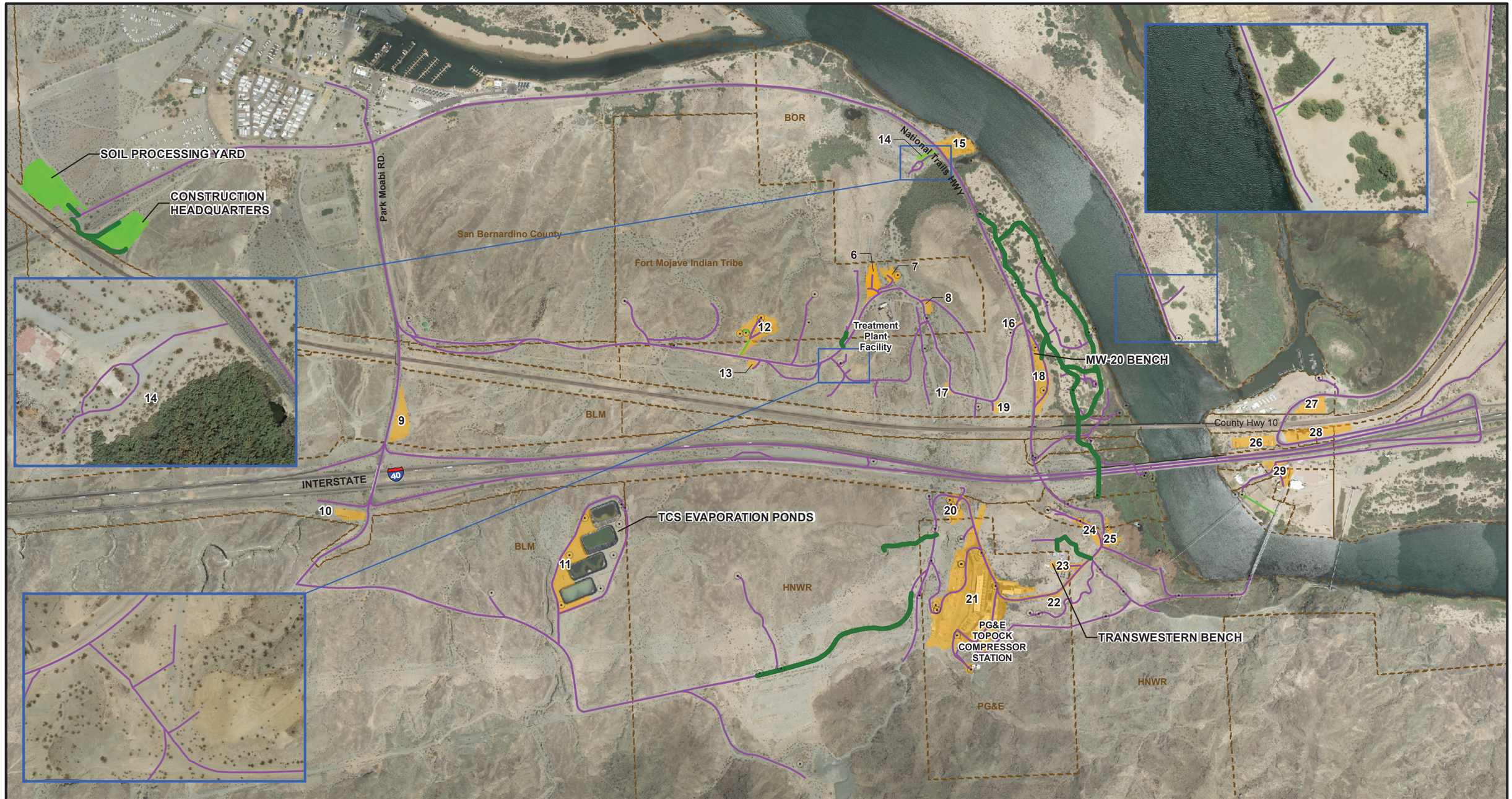
Note:
* CH2M HILL, Inc. (CH2M). 2015a. *Basis of Design Report/Final (100%) Design Submittal for the Final Groundwater Remedy, PG&E Topock Compressor Station, Needles, California*. November 18.

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

March 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	95%	Site prep, excavation, conduit installation, subgrade backfill, and concrete placement complete. Install rip rap in April.
Pipeline C Segments C1 through C10	Not Available	Completed floodplain vegetation clearing. 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 April.
MW-E	95%	Complete. Surface completion in April.
MW-F	95%	Well construction complete. Surface completion in April.
MW-G	95%	Well construction and development complete. Surface completion in April.
MW-L	95%	Well construction complete. Surface completion and development in April.
MW-N	95%	Well construction complete. Surface completion and development in April.
MW-W	95%	Well construction complete. Surface completion and development in April.
MW-10D	95%	Well construction complete. Surface completion and development in April.
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 in progress.

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

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Attachment A
Photographs

Grading along Pipeline C5

Backfill along Pipeline C5

Concrete pour along Pipeline C5

Relaxing pipe along the Pipeline C3 work area

Dual Rotary Drilling at IRZ-20

Air Vacuum Excavation to Daylight Utilities Along National Trails Highway

Compaction for brine tank containment upgrade

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

Table B-1. Groundwater Sampling Results for March 2019

March 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-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	Data not yet available	< 0.33 U
MW-B	MW-B-VAS-352-357	02/28/19	352 - 357	0.603 J	< 0.33 U
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	70 (WD)	-	3000
MW-E	MW-E-142-121418	12/14/18	142 (WD)	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-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-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
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-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-W	MW-W-VAS-7-12	03/27/19	7 - 12	Data not yet available	< 0.17 U

Table B-1. Groundwater Sampling Results for March 2019

March 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-W	MW-W-VAS-22-27	03/28/19	22 - 27	Data not yet available	< 0.33 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
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	NA
IRZ-17	IRZ-17-VAS-142-147	03/04/19	142 - 147	68	84

Table B-1. Groundwater Sampling Results for March 2019

March 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-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
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	Data not yet available	4400
IRZ-27	IRZ-27-VAS-72-77	03/17/19	72 - 77	Data not yet available	< 0.033 U
IRZ-27	IRZ-27-VAS-102-107	03/18/19	102 - 107	Data not yet available	< 0.17 U
IRZ-27	IRZ-27-VAS-132-137	03/20/19	132 - 137	Data not yet available	1300

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.: IRZ-17 Pilot

Date Started:	03/02/2019	Surface Elevation:	N/A		
Date Completed:	03/07/2019	Northing (NAD83):	N/A		
Drilling Co.:	Cascade	Easting (NAD83):	N/A	Client:	Pacific Gas & Electric
Drilling Method:	Sonic Drilling	Total Depth:	227 ft bgs	Location:	Groundwater Remedy Phase I
Driller Name:	Steve Vasquez	Borehole Diameter:	6 in		Needles, CA
Drilling Asst:	O. Flores, L. Amaya	Depth to First Water:	24 ft bgs		
Logger:	Gantt Jeffers	Sampling Method:	10 ft Core Barrel	Project Number:	RC000753.0051
Editor:	Sean McGrane	Sampling Interval:	Continuous		
Weather:	Warm sunny to partly cloudy.	Converted to Well:	☐ Yes ☒ No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Description	Drilling Notes	Drilling Fluid
1–10	0				NR		(0.0 - 19.5') (NR); No recovery loose dredge sands falling out of core barrel could not provide core will accurate depths.	(0.0 - 17.0') Due to loose dredge sand, driller did not core.	
17–20	90			Topock - Fill	SP		(19.5 - 21.5') Topock - Fill; Poorly graded sand (SP); yellowish	(17.0 - 19.5') Loose dredge sands continuosly fell out of core barrel.	

Notes: USCS = Unified Soil Classification System, U = not detected above the laboratory reporting limit, ppb = Parts per Billion.

Boring Log

ARCADIS Design & Consultancy for natural and built assets

Date Started:	03/02/2019	Surface Elevation:	N/A	**Boring No.:**	**IRZ-17 Pilot**
Date Completed:	03/07/2019	Northing (NAD83):	N/A		
Drilling Co.:	Cascade	Easting (NAD83):	N/A	Client:	Pacific Gas & Electric
Drilling Method:	Sonic Drilling	Total Depth:	227 ft bgs	Location:	Groundwater Remedy Phase I
Driller Name:	Steve Vasquez	Borehole Diameter:	6 in		Needles, CA
Drilling Asst:	O. Flores, L. Amaya	Depth to First Water:	24 ft bgs		
Logger:	Gantt Jeffers	Sampling Method:	10 ft Core Barrel	Project Number:	RC000753.0051
Editor:	Sean McGrane	Sampling Interval:	Continuous		
Weather:	Warm sunny to partly cloudy.	Converted to Well:	☐ Yes ☒ No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Description	Drilling Notes	Drilling Fluid
21				Topock - Fill	SP		brown / moderate yellowish brown(10YR 5/4); very fine grained to fine grained, angular to subround; trace silt; little mica; dry to moist; no odor; no staining; moist at 20.5' bgs	(24.0 - 24.0') (24') Approximate depth of water table	
22				Topock - Fluvial Deposits	SM		(21.5 - 24.0') Topock - Fluvial Deposits; Silty sand with gravel (SM); dark yellowish brown (10YR 4/4); very fine grained to very coarse grained, subangular to round; some granules to very large pebbles, subangular to round; little silt; trace cobbles, subangular to subround; moist; no odor; no staining; larger clasts consist of sandstone, granodiorite and metadiorite. Higher gravel content at bottom 4" of soil bed.		
23	90								
24		IRZ-17-SS-22-27 3/7/2019 11:28:00 AM		Topock - Fluvial Deposits	ML		(24.0 - 28.0') Topock - Fluvial Deposits; Sandy silt with gravel (ML); yellowish brown / moderate yellowish brown(10YR 5/4); no plasticity, slow dilatency; some very fine to fine grained sand, subangular to subround; little granules to very large pebbles, subangular to round; trace cobbles, subround to round; trace mica; wet; medium stiff; no odor; no staining		
25									
26							(26'); some granules to very large pebbles, subangular to round; trace fine to very course sand, 3" lense at 26' bgs of decrease in silt.		
27									
28				Topock - Fluvial Deposits	SM		(28.0 - 29.0') Topock - Fluvial Deposits; Silty sand with gravel (SM); yellowish brown / moderate yellowish brown(10YR 5/4); very fine grained to fine grained, subangular to round; and silt; little granules to very large pebbles, subangular to round; little mica; wet; no odor; no staining; trace med to very fine sand.		
29	60	IRZ-17-SS-27-32 3/7/2019 11:33:00 AM		Topock - Fluvial Deposits	ML		(29.0 - 30.0') Topock - Fluvial Deposits; Sandy silt with gravel (ML); yellowish brown / moderate yellowish brown(10YR 5/4); medium plasticity, slow dilatency; some very fine to fine grained sand, subangular to subround; little granules to very large pebbles, subangular to round; trace mica; wet; medium stiff; no odor; no staining		
30									
31				Topock - Fluvial Deposits	MH		(30.0 - 33.5') Topock - Fluvial Deposits; Elastic silt with sand (MH); yellowish brown / moderate yellowish brown(10YR 5/4); high plasticity, no dilatency; little very fine grained sand, subangular to subround; trace granules to very large pebbles, subround to round; trace cobbles, round; trace clay; trace mica; wet; very soft; no odor; no staining; increase granules to very large pebbles at bottom of soil bed (4"), oxidized staining observed at bottom of bed.		
32									
33									
34		IRZ-17-SS-32-37 3/7/2019 11:36:00 AM	IRZ-17-VAS-32-37 (67 ppb) 3/2/2019 1:14:00 PM	Topock - Fluvial Deposits	SM		(33.5 - 35.5') Topock - Fluvial Deposits; Silty sand with gravel (SM); yellowish brown / moderate yellowish brown(10YR 5/4); very fine grained to very coarse grained, subangular to round; some silt; little granules to very large pebbles, subround to round; trace cobbles, round; trace clay; little mica; wet; no odor; iron oxide staining		
35	48								
36				Topock - Alluvium Deposits	SM		(35.5 - 38.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); yellowish brown / moderate yellowish brown(10YR 5/4); very fine grained to very coarse grained, angular to subangular; some granules to very large pebbles, angular to subangular; little silt; little mica; wet; no odor; no staining		
37									
38		IRZ-17-SS-36-42 3/7/2019 11:45:00 AM		Topock - Alluvium Deposits	GM		(38.0 - 44.5') Topock - Alluvium Deposits; Silty gravel with sand (GM); reddish brown (5YR 4/3); granules to very large pebbles, angular to subround; some very fine to very coarse grained sand, angular to subround; little silt; trace mica; wet; no odor; no staining; larger clasts consist of granodiorite.		
39	240								
40									

Notes: USCS = Unified Soil Classification System, U = not detected above the laboratory reporting limit, ppb = Parts per Billion.

Boring Log

ARCADIS Design & Consultancy for natural and built assets

Date Started:	03/02/2019	Surface Elevation:	N/A	**Boring No.:**	**IRZ-17 Pilot**
Date Completed:	03/07/2019	Northing (NAD83):	N/A		
Drilling Co.:	Cascade	Easting (NAD83):	N/A	Client:	Pacific Gas & Electric
Drilling Method:	Sonic Drilling	Total Depth:	227 ft bgs	Location:	Groundwater Remedy Phase I
Driller Name:	Steve Vasquez	Borehole Diameter:	6 in		Needles, CA
Drilling Asst:	O. Flores, L. Amaya	Depth to First Water:	24 ft bgs		
Logger:	Gantt Jeffers	Sampling Method:	10 ft Core Barrel	Project Number:	RC000753.0051
Editor:	Sean McGrane	Sampling Interval:	Continuous		
Weather:	Warm sunny to partly cloudy.	Converted to Well:	☐ Yes ☒ No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Description	Drilling Notes	Drilling Fluid
41		IRZ-17-SS-36-42 3/7/2019 11:45:00 AM		Topock - Alluvium Deposits	GM		(40'); Increase in granules to very large pebbles.		
42									
43									
44		IRZ-17-SS-42-47 3/7/2019 11:50:00 AM							
45							(44.5 - 53.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); reddish brown / moderate brown(5YR 4/4); very fine grained to very coarse grained, angular to subangular; little granules to very large pebbles, angular to subangular; little silt; trace cobbles, angular; little mica; wet; no odor; no staining; larger clasts consist of granodiorite and metadiorite.		
46									
47							(46.5'); some granules to very large pebbles, angular to subangular; decrease in sand and silt.		
48	240			Topock - Alluvium Deposits	SM				
49		IRZ-17-SS-47-52 3/7/2019 11:55:00 AM					(49'); increase in silt, decrease in granules to very large pebbles.		
50									
51							(49.5'); decrease in silt.		
52									
53				Topock - Alluvium Deposits	SW		(53.0 - 54.0') Topock - Alluvium Deposits; Well graded sand with gravel (SW); brown (10YR 4/3); very fine grained to very coarse grained, angular to subround; little granules to very large pebbles, angular to subround; trace cobbles, subround; trace silt; little mica; wet; no odor; no staining; larger clasts consist of granodiorite, clasts coarsen downward.		
54		IRZ-17-SS-52-57 3/7/2019 12:10:00 PM		Topock - Alluvium Deposits	SM		(54.0 - 57.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); reddish brown / moderate brown(5YR 4/4); very fine grained to very coarse grained, subangular to subround; some granules to very large pebbles, angular to subround; little silt; little mica; wet; no odor; no staining; larger clasts consist of granodiorites.		
55									
56									
57									
58	120	IRZ-17-SS-57-62 3/7/2019 12:25:00 PM		Topock - Alluvium Deposits	SW-SM		(57.0 - 59.0') Topock - Alluvium Deposits; Well graded sand with silt and gravel (SW-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 mica; wet; no odor; no staining; larger clasts consist of granodiorite.		
59				Topock - Alluvium Deposits	ML		(59.0 - 59.5') Topock - Alluvium Deposits; Sandy silt with gravel (ML); reddish brown / moderate brown(5YR 4/4); low plasticity, no dilatency; some very fine to very coarse grained sand, angular to		
60					SM				

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ARCADIS Design & Consultancy for natural and built assets

Boring Log

Boring No.: IRZ-17 Pilot

Date Started:	03/02/2019	Surface Elevation:	N/A		
Date Completed:	03/07/2019	Northing (NAD83):	N/A		
Drilling Co.:	Cascade	Easting (NAD83):	N/A	Client:	Pacific Gas & Electric
Drilling Method:	Sonic Drilling	Total Depth:	227 ft bgs	Location:	Groundwater Remedy Phase I
Driller Name:	Steve Vasquez	Borehole Diameter:	6 in		Needles, CA
Drilling Asst:	O. Flores, L. Amaya	Depth to First Water:	24 ft bgs		
Logger:	Gantt Jeffers	Sampling Method:	10 ft Core Barrel	Project Number:	RC000753.0051
Editor:	Sean McGrane	Sampling Interval:	Continuous		
Weather:	Warm sunny to partly cloudy.	Converted to Well:	☐ Yes ☒ No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Description	Drilling Notes	Drilling Fluid
61	120	IRZ-17-SS-57-62 3/7/2019 12:25:00 PM		Topock - Alluvium Deposits	SM		subround; little granules to very large pebbles, angular to subangular; trace mica; wet; medium stiff to stiff; no odor; no staining (59.5 - 64.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); reddish brown / moderate brown(5YR 4/4); very fine grained to very coarse grained, subangular to subround; some granules to very large pebbles, angular to subangular; some silt; little mica; wet; no odor; no staining; larger clasts consist of metadiorite and granodiorite. (60'); little silt; increase in sand. (61'); some silt; decrease in sand.		
62									
63									
64		IRZ-17-SS-62-67 3/7/2019 1:05:00 PM	IRZ-17-VAS-62-67 (0.604 J ppb) 3/2/2019 3:50:00 PM	Topock - Alluvium Deposits	GM		(64.0 - 65.0') Topock - Alluvium Deposits; Silty gravel with sand (GM); reddish brown / moderate brown(5YR 4/4); granules to very large pebbles, angular to subangular; and very fine to very coarse grained sand, subangular to subround; little silt; little mica; wet; no odor; no staining		
65									
66							(65.0 - 75.5') Topock - Alluvium Deposits; Silty sand with gravel (SM); brown (10YR 5/3); very fine grained to very coarse grained, angular to subround; some granules to very large pebbles, angular to subangular; little silt; trace mica; wet; no odor; weak cementation; no staining (66') reddish brown / moderate brown(5YR 4/4); some silt; decrease in granules to very large pebbles, no cementation. (67'); little granules to very large pebbles, angular to subangular; increase in sand, increase in silt, weathered granules to very large pebbles observed.	(67.0 - 87.0') Core compaction observed. switch back to 10' runs.	
67									
68	192	IRZ-17-SS-67-72 3/7/2019 1:12:00 PM		Topock - Alluvium Deposits	SM				
69									
70									
71							(70.5'); some granules to very large pebbles, angular to subangular; weathered granules to very large pebbles observed.		
72									
73		IRZ-17-SS-72-77 3/7/2019 1:25:00 PM							
74							(73.5'); little granules to very large pebbles, angular to subangular; increase in silt.		
75									
76				Topock - Alluvium Deposits	ML		(75.5 - 80.5') Topock - Alluvium Deposits; Sandy silt with gravel (ML); reddish brown (5YR 5/4); no plasticity, slow dilatency; some granules to very large pebbles, angular to subangular; some very fine to very coarse grained sand, subangular to subround; trace mica; wet; stiff; no odor; no staining		
77									
78		IRZ-17-SS-77-82 3/7/2019 1:35:00 PM							
79									
80									

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Boring Log

ARCADIS Design & Consultancy for natural and built assets

Date Started:	03/02/2019	Surface Elevation:	N/A	**Boring No.:**	**IRZ-17 Pilot**
Date Completed:	03/07/2019	Northing (NAD83):	N/A		
Drilling Co.:	Cascade	Easting (NAD83):	N/A	Client:	Pacific Gas & Electric
Drilling Method:	Sonic Drilling	Total Depth:	227 ft bgs	Location:	Groundwater Remedy Phase I
Driller Name:	Steve Vasquez	Borehole Diameter:	6 in		Needles, CA
Drilling Asst:	O. Flores, L. Amaya	Depth to First Water:	24 ft bgs		
Logger:	Gantt Jeffers	Sampling Method:	10 ft Core Barrel	Project Number:	RC000753.0051
Editor:	Sean McGrane	Sampling Interval:	Continuous		
Weather:	Warm sunny to partly cloudy.	Converted to Well:	☐ Yes ☒ No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Description	Drilling Notes	Drilling Fluid
					ML			(67.0 - 87.0') Core compaction observed. switch back to 10' runs.	
81	192	IRZ-17-SS-77-82 3/7/2019 1:35:00 PM		Topock - Alluvium Deposits	SM		(80.5 - 82.0') 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 subangular; some silt; trace mica; wet; no odor; no staining		
82									
83		IRZ-17-SS-82-87 3/7/2019 1:51:00 PM		Topock - Alluvium Deposits	ML		(82.0 - 85.5') Topock - Alluvium Deposits; Sandy silt with gravel (ML); reddish brown (5YR 5/4); no plasticity, no dilatency; some granules to very large pebbles, angular to subangular; some very fine to very coarse grained sand, subangular to subround; trace mica; wet; very stiff; no odor; weak cementation; iron oxide staining		
84									
85									
86				Topock - Alluvium Deposits	SM		(85.5 - 88.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); reddish brown / moderate brown(5YR 4/4) trace dusky red(5R 3/4); very fine grained to very coarse grained, angular to subround; some granules to very large pebbles, angular to subangular; some silt; trace mica; wet; no odor; iron oxide staining; crushed gravel fragments at bottom of formation.		
87									
88	120	IRZ-17-SS-87-92 3/7/2019 2:01:00 PM		Topock - Alluvium Deposits	ML		(88.0 - 96.5') Topock - Alluvium Deposits; Sandy silt with gravel (ML); reddish brown (5YR 5/4); no plasticity, no dilatency; some granules to very large pebbles, angular; some very fine to very coarse grained sand, angular to subround; trace mica; wet; very stiff; no odor		
89									
90									
91									
92							(92'); moist; weak cementation; increase in granules to very large pebbles, decrease in sand.		
93									
94		IRZ-17-SS-92-97 3/7/2019 2:07:00 PM							
95									
96									
97									
98	120	IRZ-17-SS-97-102 3/7/2019 2:12:00 PM		Topock - Alluvium Deposits	SM		(96.5 - 119.0') 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; some silt; trace mica; wet; no odor; no staining		
99									
100							(99.5'); little silt; increase in granules to very large pebbles.		

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Boring Log

ARCADIS Design & Consultancy for natural and built assets

Date Started:	03/02/2019	Surface Elevation:	N/A	**Boring No.:**	**IRZ-17 Pilot**
Date Completed:	03/07/2019	Northing (NAD83):	N/A		
Drilling Co.:	Cascade	Easting (NAD83):	N/A	Client:	Pacific Gas & Electric
Drilling Method:	Sonic Drilling	Total Depth:	227 ft bgs	Location:	Groundwater Remedy Phase I
Driller Name:	Steve Vasquez	Borehole Diameter:	6 in		Needles, CA
Drilling Asst:	O. Flores, L. Amaya	Depth to First Water:	24 ft bgs		
Logger:	Gantt Jeffers	Sampling Method:	10 ft Core Barrel	Project Number:	RC000753.0051
Editor:	Sean McGrane	Sampling Interval:	Continuous		
Weather:	Warm sunny to partly cloudy.	Converted to Well:	☐ Yes ☒ No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Description	Drilling Notes	Drilling Fluid
101		IRZ-17-SS-97-102 3/7/2019 2:12:00 PM							
102							(102'); some silt; moderate cementation; decrease in sand and granules to very large pebbles.		
103	120						(103'); increase in sand and granules to very large pebbles, decrease in silt.		
104		IRZ-17-SS-102-107 3/7/2019 2:18:00 PM	IRZ-17-VAS-102-107 (<0.17 U ppb) 3/3/2019 11:50:00 AM						
105									
106							(106'); decrease in sand, increase in granules to very large pebbles, silt nodules.		
107							(107'); increase slit, decrease in granules to very large pebbles.		
108									
109		IRZ-17-SS-107-112 3/7/2019 2:22:00 PM		Topock - Alluvium Deposits	SM		(108.5'); and granules to very large pebbles, angular to subround; little silt; decrease in silt.		
110							(109.5'); some silt; increase in silt, decrease in granules to very large pebbles.		
111									
112	120						(112') reddish brown / moderate brown(5YR 4/4) some dusky red(5R 3/4); increase silt, decrease granules to very large pebbles, trace weathered gravel, mottling.		
113									
114		IRZ-17-SS-112-117 3/7/2019 2:26:00 PM							
115									
116									
117							(117') reddish brown / moderate brown(5YR 4/4); little silt; decrease in silt, increase sand, no mottling.		
118	120	IRZ-17-SS-117-122 3/7/2019 2:31:00 PM							
119				Topock - Alluvium Deposits	ML		(119.0 - 124.0') Topock - Alluvium Deposits; Sandy silt with gravel (ML); reddish brown / moderate brown(5YR 4/4) trace dusky red(5R 3/4); low plasticity, no dilatency; some granules to very		
120									

Notes: USCS = Unified Soil Classification System, U = not detected above the laboratory reporting limit, ppb = Parts per Billion.

Date Started: 03/02/2019
Date Completed: 03/07/2019
Drilling Co.: Cascade
Drilling Method: Sonic Drilling
Driller Name: Steve Vasquez
Drilling Asst: O. Flores, L. Amaya
Logger: Gantt Jeffers
Editor: Sean McGrane
Weather: Warm sunny to partly cloudy.

Surface Elevation: N/A
Northing (NAD83): N/A
Easting (NAD83): N/A
Total Depth: 227 ft bgs
Borehole Diameter: 6 in
Depth to First Water: 24 ft bgs
Sampling Method: 10 ft Core Barrel
Sampling Interval: Continuous
Converted to Well: ☐ Yes ☒ No

Boring No.: IRZ-17 Pilot

Client: Pacific Gas & Electric
Location: Groundwater Remedy Phase I
Needles, CA
Project Number: RC000753.0051

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Description	Drilling Notes	Drilling Fluid
121	120	IRZ-17-SS-117-122 3/7/2019 2:31:00 PM		Topock - Alluvium Deposits	ML		large pebbles, angular to subangular; some very fine to very coarse grained sand, angular to subround; wet; medium stiff to stiff; no odor; no staining; larger clasts consist of granodiorite and metadiorite. (120'); decrease in sand, increase in granules to very large pebbles. (122'); decrease silt, increase sand.		
122									
123									
124		IRZ-17-SS-122-127 3/7/2019 2:36:00 PM		Topock - Alluvium Deposits	SM		(124.0 - 132.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); brown (7.5YR 4/3) some (7.5R 4/6); very fine grained to very coarse grained, angular to subround; some granules to very large pebbles, angular to subround; little silt; trace mica; wet; no odor; no staining; larger clasts consist of quartzite, granodiorite, and metadiorite, weathered gravel observed. (126') reddish brown / moderate brown(5YR 4/4); some silt; decrease sand.		
125									
126									
127									
128		IRZ-17-SS-127-132 3/7/2019 2:40:00 PM					(129.5 - 132.0'); little silt; increase sand.		
129									
130									
131									
132	120			Topock - Alluvium Deposits	ML		(132.0 - 133.0') Topock - Alluvium Deposits; Sandy silt with gravel (ML); reddish brown / moderate brown(5YR 4/4); low plasticity, no dilatency; some granules to very large pebbles, angular to subround; some very fine to very coarse grained sand, angular to subround; trace cobbles, subangular to subround; wet; stiff; no odor; no staining; larger clasts consist of metadiorite.		
133		IRZ-17-SS-132-137 3/7/2019 2:45:00 PM	IRZ-17VAS-132-137 (<0.17 U ppb) 3/13/2019 12:05:00 PM	Topock - Alluvium Deposits	GM		(133.0 - 136.5') Topock - Alluvium Deposits; Silty gravel with sand (GM); reddish brown / moderate brown(5YR 4/4); granules to very large pebbles, angular to subround; some very fine to very coarse grained sand, angular to subround; some silt; trace cobbles, subangular to subround; trace mica; wet; no odor; no staining; larger clasts consist of granite, granodiorite, and metadiorite, weathered granules to very large pebbles observed. 4" Silty sand with gravel lense at 134' bgs.		
134									
135									
136									
137									
138	120	IRZ-17-SS-137-142 3/7/2019 2:47:00 PM	IRZ-17-VAS-137-142 3/12/2019 2:50:00 PM	Topock - Alluvium Deposits	SM		(136.5 - 156.5') 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; some granules to very large pebbles, angular to subangular; some silt; trace mica; wet; no odor; no staining; larger clasts consist of metadiorite and granodiorite, trace weathered granules to very coarse pebbles. (137'); decrease granules to very large pebbles, increase sand.		
139									
140									

Notes: USCS = Unified Soil Classification System, U = not detected above the laboratory reporting limit, ppb = Parts per Billion.

Date Started:	03/02/2019	Surface Elevation:	N/A	**Boring No.:**	**IRZ-17 Pilot**
Date Completed:	03/07/2019	Northing (NAD83):	N/A		
Drilling Co.:	Cascade	Easting (NAD83):	N/A	Client:	Pacific Gas & Electric
Drilling Method:	Sonic Drilling	Total Depth:	227 ft bgs	Location:	Groundwater Remedy Phase I
Driller Name:	Steve Vasquez	Borehole Diameter:	6 in		Needles, CA
Drilling Asst:	O. Flores, L. Amaya	Depth to First Water:	24 ft bgs		
Logger:	Gantt Jeffers	Sampling Method:	10 ft Core Barrel	Project Number:	RC000753.0051
Editor:	Sean McGrane	Sampling Interval:	Continuous		
Weather:	Warm sunny to partly cloudy.	Converted to Well:	☐ Yes ☒ No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Description	Drilling Notes	Drilling Fluid
141		IRZ-17-SS-137-142 3/7/2019 2:47:00 PM	IRZ-17-VAS-137-142 3/12/2019 2:50:00 PM						
142							(142'); little silt; decrease in granules to very large pebbles, increase in sand.		
143	120								
144		IRZ-17-SS-142-147 3/7/2019 2:50:00 PM	IRZ-17-VAS-142-147 (84 ppb) 3/4/2019 10:24:00 AM						
145							(145'); some silt; decrease in sand.		
146									
147									
148				Topock - Alluvium Deposits	SM				
149		IRZ-17-SS-147-152 3/7/2019 2:53:00 PM	IRZ-17-VAS-147-152 (<0.33 U ppb) 3/12/2019 11:05:53 AM						
150									
151									
152	120						(152') dark grayish brown (2.5Y 4/2); decrease in sand, increase silt, some mottling.		
153							(153'); increase in sand, decrease silt, no moddling.		
154		IRZ-17-SS-152-157 3/7/2019 2:57:00 PM	IRZ-17-VAS-152-157 (7.0 ppb) 3/4/2019 12:00:00 PM						
155							(154.5'); 12-24 mm silt nodules.		
156									
157									
158				Topock - Alluvium Deposits	ML		(156.5 - 160.5') Topock - Alluvium Deposits; Sandy silt with gravel (ML); reddish brown / moderate brown(5YR 4/4); low plasticity, no dilatency; some granules to very large pebbles, angular to subround; some very fine to very coarse grained sand, angular to subround; wet; stiff; no odor; no staining; larger clasts consist of granodiorite, metadiorite, and feldspars.		
159	120	IRZ-17-SS-157-162 3/7/2019 2:59:00 PM					(158'); moist; hard; weak cementation; decrease silt, increase sand. (158.5'); wet; very stiff; increase silt, no cementation.		
160									

Notes: USCS = Unified Soil Classification System, U = not detected above the laboratory reporting limit, ppb = Parts per Billion.

Boring Log

Boring No.: IRZ-17 Pilot

Date Started:	03/02/2019	Surface Elevation:	N/A		
Date Completed:	03/07/2019	Northing (NAD83):	N/A		
Drilling Co.:	Cascade	Easting (NAD83):	N/A	Client:	Pacific Gas & Electric
Drilling Method:	Sonic Drilling	Total Depth:	227 ft bgs	Location:	Groundwater Remedy Phase I
Driller Name:	Steve Vasquez	Borehole Diameter:	6 in		Needles, CA
Drilling Asst:	O. Flores, L. Amaya	Depth to First Water:	24 ft bgs		
Logger:	Gantt Jeffers	Sampling Method:	10 ft Core Barrel	Project Number:	RC000753.0051
Editor:	Sean McGrane	Sampling Interval:	Continuous		
Weather:	Warm sunny to partly cloudy.	Converted to Well:	☐ Yes ☒ No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Description	Drilling Notes	Drilling Fluid
					ML				
161		IRZ-17-SS-157-162 3/7/2019 2:59:00 PM		Topock - Alluvium Deposits	SM		(160.5 - 162.5') Topock - Alluvium Deposits; Silty sand (SM); reddish brown / moderate brown(5YR 4/4); very fine grained to very coarse grained, angular to subangular; little granules to large pebbles, subangular to subround; little silt; trace mica; wet; no odor; no staining; 2-15 mm silt nodules, larger clasts consist of metadiorite.		
162									
163	120			Topock - Alluvium Deposits	GM		(162.5 - 164.0') Topock - Alluvium Deposits; Silty gravel with sand (GM); reddish brown / moderate brown(5YR 4/4); granules to very large pebbles, angular to subround; and very fine to very coarse grained sand, angular to subround; little silt; trace mica; wet; no odor; no staining; larger clasts consist of granodiorite and metadiorite.		
164		IRZ-17-SS-162-167 3/7/2019 3:01:00 PM	IRZ-17-VAS-162-167 (<0.17 U ppb) 3/4/2019 5:01:00 PM				(164.0 - 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 subangular; little granules to large pebbles, angular to subround; little silt; trace mica; wet; no odor; no staining; larger clasts consist of metadiorite. (165.5'); some granules to large pebbles, angular to subround; decrease in sand, increase in silt.		
165									
166									
167									
168									
169		IRZ-17-SS-167-172 3/7/2019 3:02:00 PM							
170							(170') dark reddish brown (5YR 3/3); and granules to large pebbles, angular to subround; decrease in sand.		
171									
172	120			Topock - Alluvium Deposits	SM				
173							(173') dark reddish brown (5YR 3/3) and black (5YR 2.5/1); silt mottled. (173.5') reddish brown / moderate brown(5YR 4/4); some granules to large pebbles, angular to subround; trace cobbles, subround; increase in sand, no mottling.		
174		IRZ-17-SS-172-177 3/7/2019 3:04:00 PM	IRZ-17-VAS-172-177 (<0.17 U ppb) 3/5/2019 3:20:00 PM						
175									
176									
177							(177'); some silt; trace clay; decrease in granules to very large pebbles and grain size, decrease sand.		
178	120	IRZ-17-SS-177-182 3/7/2019 3:05:00 PM							
179							(178.5'); little silt; no clay, increase sand, trace weathered granules to very large pebbles.		
180							(179.5'); some silt; decrease in sand.		

Notes: USCS = Unified Soil Classification System, U = not detected above the laboratory reporting limit, ppb = Parts per Billion.

Boring Log

Boring No.: IRZ-17 Pilot

Date Started:	03/02/2019	Surface Elevation:	N/A		
Date Completed:	03/07/2019	Northing (NAD83):	N/A		
Drilling Co.:	Cascade	Easting (NAD83):	N/A	Client:	Pacific Gas & Electric
Drilling Method:	Sonic Drilling	Total Depth:	227 ft bgs	Location:	Groundwater Remedy Phase I
Driller Name:	Steve Vasquez	Borehole Diameter:	6 in		Needles, CA
Drilling Asst:	O. Flores, L. Amaya	Depth to First Water:	24 ft bgs		
Logger:	Gantt Jeffers	Sampling Method:	10 ft Core Barrel	Project Number:	RC000753.0051
Editor:	Sean McGrane	Sampling Interval:	Continuous		
Weather:	Warm sunny to partly cloudy.	Converted to Well:	☐ Yes ☒ No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Description	Drilling Notes	Drilling Fluid
181		IRZ-17-SS-177-182 3/7/2019 3:05:00 PM		Topock - Alluvium Deposits	SM		(180.5'); little granules to large pebbles, angular to subround; increase sand.		
182									
183	120			Topock - Alluvium Deposits	ML		(183.0 - 185.5') Topock - Alluvium Deposits; Gravelly silt with sand (ML); yellowish red (5YR 4/6); low plasticity, no dilatency; some granules to very large pebbles, angular to subangular; some very fine to very coarse grained sand, angular to subround; trace mica; wet; stiff to very stiff; no odor; no staining; larger clasts consist of granodiorite and metadiorite.		
184		IRZ-17-SS-182-187 3/7/2019 3:06:00 PM							
185									
186				Topock - Alluvium Deposits	SM		(185.5 - 187.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); yellowish red (5YR 4/6); medium grained to very coarse grained, angular to subangular; some silt; little small to large pebbles, angular to subangular; little mica; wet; no odor; no staining; larger clasts consist of metadiorite.		
187									
188	60	IRZ-17-SS-187-192 3/7/2019 3:07:00 PM		Topock - Alluvium Deposits	ML		(187.0 - 192.0') Topock - Alluvium Deposits; Sandy silt with gravel (ML); yellowish red (5YR 4/6); low plasticity, no dilatency; some granules to very large pebbles, angular to subround; some very fine to very coarse grained sand, angular to subround; trace mica; wet; stiff; no odor; no staining; larger clasts consist of metadiorite.		
189									
190									
191									
192									
193	60			Topock - Weathered Bedrock - conglomerate	SM		(192.0 - 206.5') Topock - Weathered Bedrock - conglomerate; Silty sand with gravel (SM); reddish brown (2.5YR 4/4); very fine grained to very coarse grained, angular to subangular; some granules to very large pebbles, angular to subangular; some silt; some mica; wet; no odor; weak cementation; no staining; trace weathered granules, tight formation.		
194									
195									
196									
197									
198	60		IRZ-17-VAS-197-202 (<0.17 U ppb) 3/6/2019 11:20:00 AM						
199									
200									

Notes: USCS = Unified Soil Classification System, U = not detected above the laboratory reporting limit, ppb = Parts per Billion.

Boring Log

ARCADIS Design & Consultancy for natural and built assets

Date Started:	03/02/2019	Surface Elevation:	N/A	**Boring No.:**	**IRZ-17 Pilot**
Date Completed:	03/07/2019	Northing (NAD83):	N/A		
Drilling Co.:	Cascade	Easting (NAD83):	N/A	Client:	Pacific Gas & Electric
Drilling Method:	Sonic Drilling	Total Depth:	227 ft bgs	Location:	Groundwater Remedy Phase I
Driller Name:	Steve Vasquez	Borehole Diameter:	6 in		Needles, CA
Drilling Asst:	O. Flores, L. Amaya	Depth to First Water:	24 ft bgs		
Logger:	Gantt Jeffers	Sampling Method:	10 ft Core Barrel	Project Number:	RC000753.0051
Editor:	Sean McGrane	Sampling Interval:	Continuous		
Weather:	Warm sunny to partly cloudy.	Converted to Well:	☐ Yes ☒ No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Description	Drilling Notes	Drilling Fluid
201	60		IRZ-17-VAS-197-202 (<0.17 U ppb) 3/6/2019 11:20:00 AM	Topock - Weathered Bedrock - conglomerate	SM				
202									
203									
204									
205									
206									
207	120			Topock - Weathered Bedrock - conglomerate	ML		(206.5 - 209.5') Topock - Weathered Bedrock - conglomerate; Sandy silt with gravel (ML); red (2.5YR 4/6); low plasticity, no dilatency; some granules to very large pebbles, angular to subangular; some very fine to very coarse grained sand, angular to subround; trace mica; wet; very stiff; no odor; weak cementation; no staining; larger clasts consist of metadiorite and granodiarite trace weathred granules to very large pebbles.		
208									
209									
210				Topock - Weathered Bedrock - conglomerate	SM		(209.5 - 213.0') Topock - Weathered Bedrock - conglomerate; Silty sand with gravel (SM); reddish brown (2.5YR 4/4); very fine grained to very coarse grained, subangular to subround; some granules to very large pebbles, angular to subangular; some silt; some mica; wet; no odor; no staining; trace weathered granules to very large pebbles.		
211									
212								(212.0 - 222.0') Soft drilling	
213									
214				Topock - Weathered Bedrock - conglomerate	ML		(213.0 - 215.5') Topock - Weathered Bedrock - conglomerate; Sandy silt with gravel (ML); red (2.5YR 4/6); low plasticity, no dilatency; some granules to very large pebbles, angular to subangular; some very fine to very coarse grained sand, angular to subround; trace mica; wet; very stiff; no odor; no staining; larger clasts consist of metadiorite and granodiarite. trace weathred granules to very large pebbles.		
215									
216	120			Topock - Weathered Bedrock - conglomerate	SM		(215.5 - 227.0') Topock - Weathered Bedrock - conglomerate; Silty sand with gravel (SM); reddish brown (2.5YR 4/4); very fine grained to very coarse grained, subangular to subround; some granules to very large pebbles, angular to subangular; some silt; some mica; wet; no odor; no staining; trace weathered granules to very large pebbles.		
217									
218			IRZ-17-VAS-217-222 (<0.17 U ppb) 3/6/2019 4:17:00 PM						
219									
220									

Notes: USCS = Unified Soil Classification System, U = not detected above the laboratory reporting limit, ppb = Parts per Billion.

ARCADIS Design & Consultancy for natural and built assets

Boring Log

Boring No.: IRZ-17 Pilot

Date Started:	03/02/2019	Surface Elevation:	N/A		
Date Completed:	03/07/2019	Northing (NAD83):	N/A		
Drilling Co.:	Cascade	Easting (NAD83):	N/A	Client:	Pacific Gas & Electric
Drilling Method:	Sonic Drilling	Total Depth:	227 ft bgs	Location:	Groundwater Remedy Phase I
Driller Name:	Steve Vasquez	Borehole Diameter:	6 in		Needles, CA
Drilling Asst:	O. Flores, L. Amaya	Depth to First Water:	24 ft bgs		
Logger:	Gantt Jeffers	Sampling Method:	10 ft Core Barrel	Project Number:	RC000753.0051
Editor:	Sean McGrane	Sampling Interval:	Continuous		
Weather:	Warm sunny to partly cloudy.	Converted to Well:	☐ Yes ☒ No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Description	Drilling Notes	Drilling Fluid
221	120		IRZ-17-VAS-217-222 (<0.17 U ppb) 3/6/2019 4:17:00 PM	Topock - Weathered Bedrock - conglomerate	SM			(212.0 - 222.0') Soft drilling	
222									
223									
224	60								
225									
226									
227							End of Boring at 227.0 'bgs.		
228									
229									
230									
231									
232									
233									
234									
235									
236									
237									
238									
239									
240									

Notes: USCS = Unified Soil Classification System, U = not detected above the laboratory reporting limit, ppb = Parts per Billion.

Boring Log

ARCADIS Design & Consultancy for natural and built assets

Boring No.: MW-W

Date Started:	03/27/2019	Surface Elevation:	N/A	Client:	Pacific Gas & Electric
Date Completed:	03/30/2019	Northing (NAD83):	N/A		
Drilling Co.:	Cascade	Easting (NAD83):	N/A	Location:	Groundwater Remedy Phase I
Drilling Method:	Sonic Drilling	Total Depth:	43 ft bgs		Needles, CA
Driller Name:	Steve Vasquez	Borehole Diameter:	6 in		
Drilling Asst:	L. Amaya/ O. Flores	Depth to First Water:	5 ft bgs		
Logger:	Gantt Jeffers	Sampling Method:	10 ft Core Barrel	Project Number:	RC000753.0051
Editor:	Sean McGrane	Sampling Interval:	Continuous		
Weather:	Warm, sunny, cloudy.	Converted to Well:	☒ Yes ☐ No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Description	Drilling Notes	Drilling Fluid
1–5	60				NR		(0.0 - 5.0') (NR); No recovery, hand augered for utility clearance.	(0.0 - 5.0') hand augered for utility clearance.	(0.0 - 12.0') 50 gal of water used
5–7	24			Topock - Fluvial Deposits	SP-SM		(5.0 - 6.5') Topock - Fluvial Deposits; Poorly graded sand with silt (SP-SM); brown (7.5YR 5/4); very fine grained to fine grained, subangular to subround; little silt; trace granules to small pebbles, round; trace cobbles, round; trace mica; moist to wet; no odor; no staining; larger clasts consist of granodiarites.	(5.0 - 12.0') Soft drilling (5.0') Approximate depth to water table	
7–12	60		MW-W-VAS-7-12 (<0.17 U ppb) 3/27/2019 4:55:00 PM	Topock - Fluvial Deposits	SP		(6.5 - 26.0') Topock - Fluvial Deposits; Poorly graded sand (SP); brown (10YR 5/3); very fine grained to fine grained, subangular to subround; little mica; moist to wet; no odor; iron oxide staining (8') very fine grained to medium grained; Increase in grain size sand, no iron oxide staining. (10.5') very dark gray (10YR 3/1); trace silt; trace organics; decrease in sand.		
12–20	156							(12.0 - 27.0') soft drilling, compaction of soils in core.	(12.0 - 27.0') 50 gal of water used

Notes: USCS = Unified Soil Classification System, 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-W

Date Started:	03/27/2019	Surface Elevation:	N/A		
Date Completed:	03/30/2019	Northing (NAD83):	N/A		
Drilling Co.:	Cascade	Easting (NAD83):	N/A	Client:	Pacific Gas & Electric
Drilling Method:	Sonic Drilling	Total Depth:	43 ft bgs	Location:	Groundwater Remedy Phase I
Driller Name:	Steve Vasquez	Borehole Diameter:	6 in		Needles, CA
Drilling Asst:	L. Amaya/ O. Flores	Depth to First Water:	5 ft bgs		
Logger:	Gantt Jeffers	Sampling Method:	10 ft Core Barrel	Project Number:	RC000753.0051
Editor:	Sean McGrane	Sampling Interval:	Continuous		
Weather:	Warm, sunny, cloudy.	Converted to Well:	☒ Yes ☐ No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Description	Drilling Notes	Drilling Fluid
21								(12.0 - 27.0') soft drilling, compaction of soils in core.	(12.0 - 27.0') 50 gal of water used
22									
23	156		MW-W-VAS-22-27 (<0.33 U ppb) 3/28/2019 1:00:00 PM	Topock - Fluvial Deposits	SP				
24									
25									
26									
27				Topock - Fluvial Deposits	SM		(26.0 - 29.2') Topock - Fluvial Deposits; Silty sand (SM); grayish brown (2.5Y 5/2); very fine grained to fine grained, subangular to subround; little silt; little mica; little organics; wet; no odor; no staining		
28									
29	60			Topock - Weathered Bedrock - conglomerate	SM		(29.2 - 31.0') Topock - Weathered Bedrock - conglomerate; Silty sand with gravel (SM); reddish brown (2.5YR 4/4); very fine grained to coarse grained, angular to subround; and silt; little granules to very large pebbles, angular to subangular; trace mica; wet; no odor; no staining; trace very coarse sand, larger clast consist of metadiorite and granodiorites.		
30									
31							(31.0 - 43.0') Topock - Competent Bedrock - conglomerate; dark reddish brown (2.5YR 3/4); dry; moderate cementation; friable	(31.0 - 32.0') Rough drilling	
32									
33	24								
34								(34.0 - 40.0') Core was hot	
35				Topock - Competent Bedrock - conglomerate					
36									
37	72								
38									
39									
40									

Notes: USCS = Unified Soil Classification System, 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-W

Date Started:	03/27/2019	Surface Elevation:	N/A		
Date Completed:	03/30/2019	Northing (NAD83):	N/A		
Drilling Co.:	Cascade	Easting (NAD83):	N/A	Client:	Pacific Gas & Electric
Drilling Method:	Sonic Drilling	Total Depth:	43 ft bgs	Location:	Groundwater Remedy Phase I
Driller Name:	Steve Vasquez	Borehole Diameter:	6 in		Needles, CA
Drilling Asst:	L. Amaya/ O. Flores	Depth to First Water:	5 ft bgs		
Logger:	Gantt Jeffers	Sampling Method:	10 ft Core Barrel	Project Number:	RC000753.0051
Editor:	Sean McGrane	Sampling Interval:	Continuous		
Weather:	Warm, sunny, cloudy.	Converted to Well:	☒ Yes ☐ No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Description	Drilling Notes	Drilling Fluid
41	36			Topock - Competent Bedrock - conglomerate					
42									
43							End of Boring at 43.0 'bgs.		
44									
45									
46									
47									
48									
49									
50									
51									
52									
53									
54									
55									
56									
57									
58									
59									
60									

Notes: USCS = Unified Soil Classification System, U = not detected above the laboratory reporting limit, ppb = Parts per Billion.

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

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

JACOBS

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 March 2019, 87 real time dust observation/monitoring events were conducted at the perimeter of the work areas (outside of the exclusion zone). There was no temporary exceedance of the action level for fugitive dust monitoring (100 µg/m3).

No perimeter air sampling for hexavalent chromium was conducted in March 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 March 2019, 36 monitoring events have been conducted at the Park Moabi monitoring location (Figure 1). The sound level typically varied between 37 and 55 dBA.

In March 2019, 24 monitoring events have been conducted at Maze B-Combined Area 1/2 (Figure 2). Construction activities closest to this monitoring location include drilling activities at MW-N in the upland, drilling and trenching activities in the floodplain, as well as activities on the MW-20 Bench. On four days (March 7, 13, 20, and 21), measurements at this location indicated sound levels up to 77 dBA. Outside of these three days, sound levels varied between 45 and 65 dBA.

In March 2019, 32 monitoring events have been conducted at Maze C-Area 1 (Figure 2). Construction activities closest to this monitoring location include drilling activities at MW-B, vegetation clearance, as well as other activities in the northern end of the floodplain. The sound level typically varied between 40 and 57 dBA.

In March 2019, two monitoring events occurred at Maze A-Area 2 (Figure 3), during the collection of soil samples in Bat Cave Wash in support of the bench scale testing for the Soil Engineering Evaluation/Cost Analysis (EE/CA) (directed by DOI). The sound level varied between 56 and 57 dBA. Continuous noise from I-40 was noted during these events.

In March 2019, one monitoring events occurred at Maze A-Area 3 (Figure 3). The sound level for this event was 51 dBA.

There have been no complaints resulting from project construction-related noise. Temporary acoustical barrier was installed at the MW-N drilling location from January through March 10, 2019, consistent with SEIR mitigation measure NOISE-2. On March 11, 2019, PG&E notified DTSC and DOI that on Friday 3/8, a high wind condition occurred at the site. At the MW-N drilling location, the wind speed was recorded at

28+ mph during a noise monitoring event at location MAZE B-Area 1 and 2. The sound barrier at MW-N was observed to sway violently under the high wind condition. PG&E assessed the situation and subsequently closed that portion of the access road to protect the public and workers and monitored the situation over the weekend. On Monday March 11, 2019, Cascade reported that they were concerned about the health and safety of their crew and anyone who travels on that portion of the access road should a high wind event were to occur at MW-N. Therefore, to protect workers and the public, the sound barrier was removed on March 11, 2019.

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

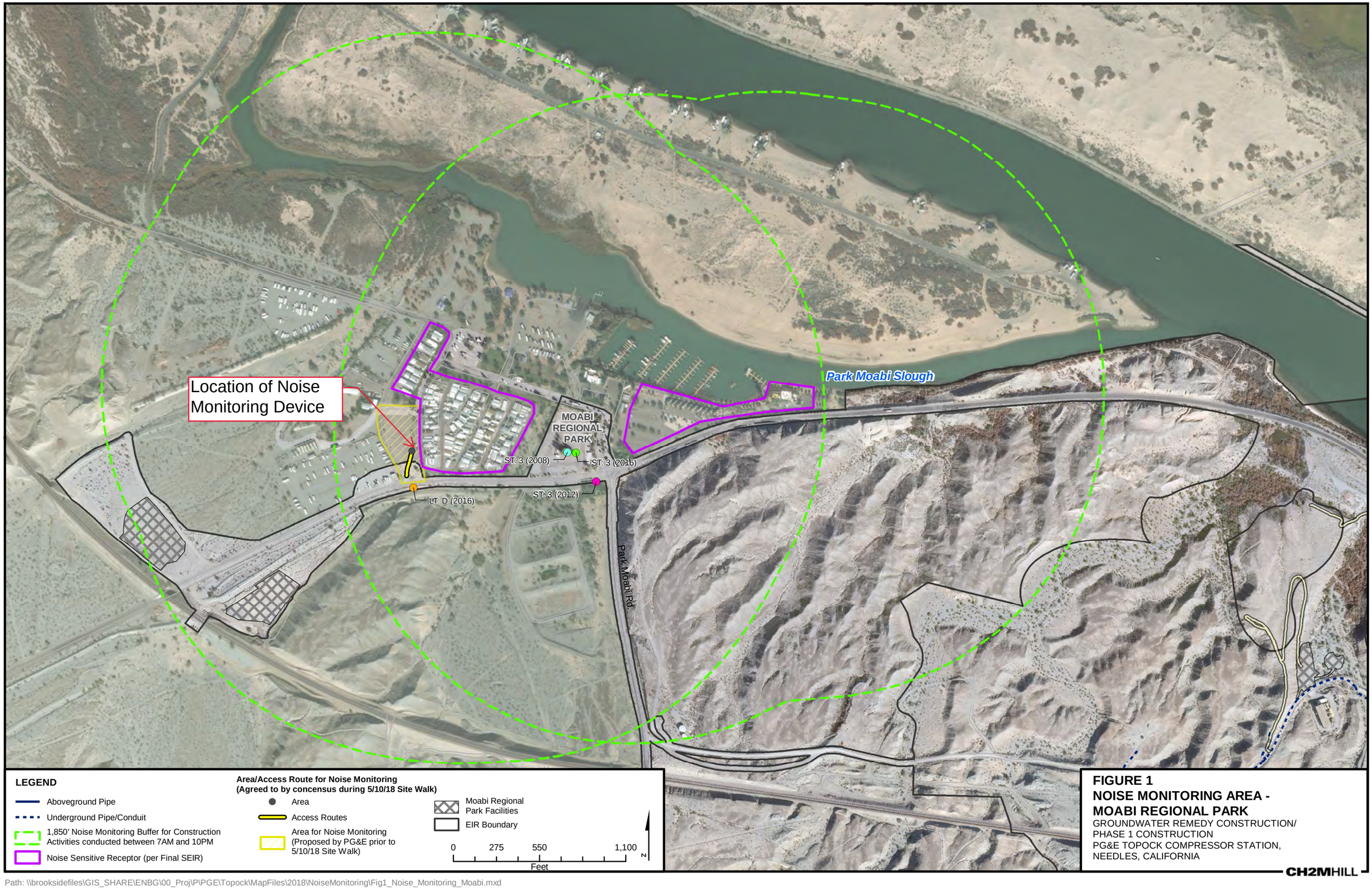
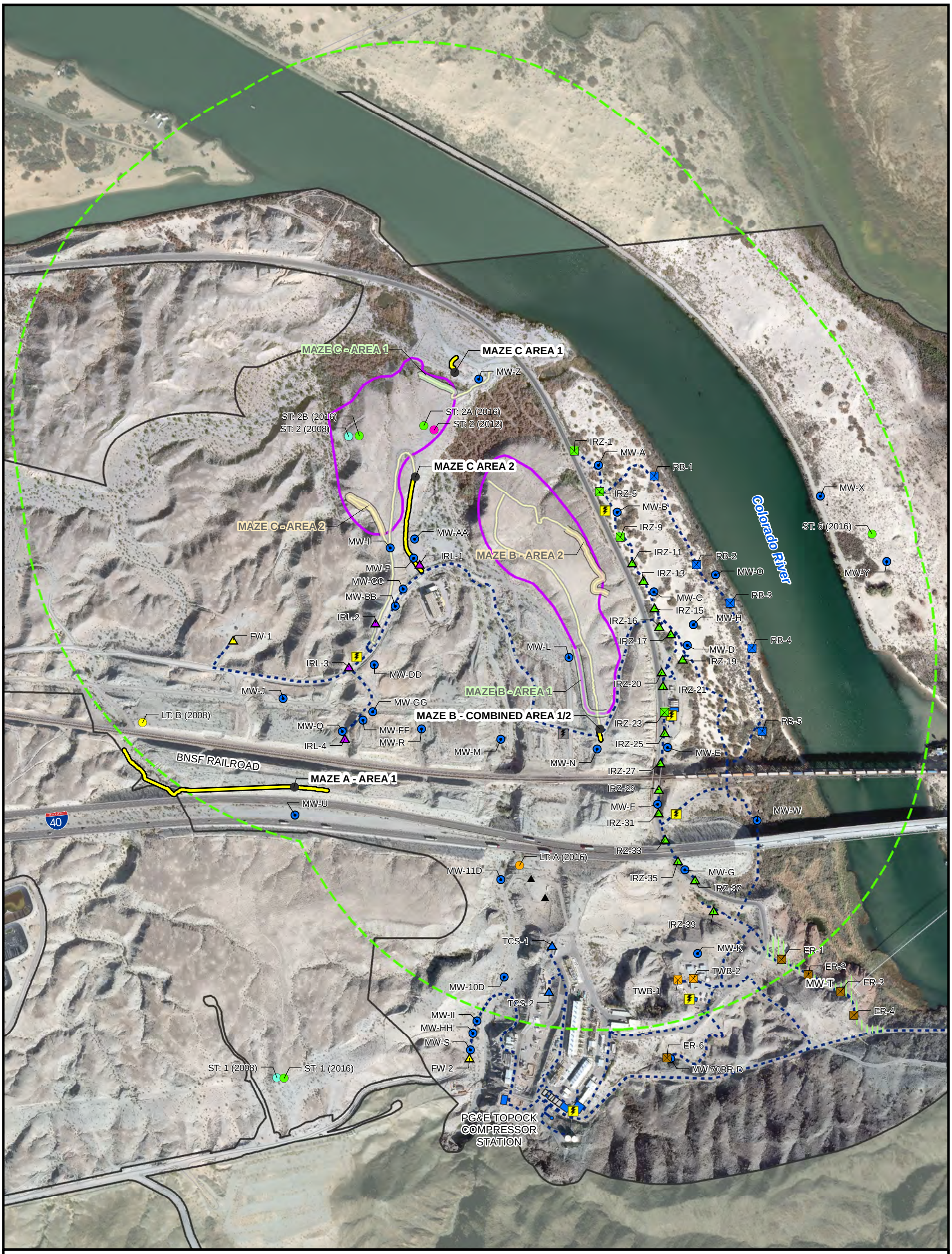


FIGURE 1
NOISE MONITORING AREA - MOABI REGIONAL PARK
GROUNDWATER REMEDY CONSTRUCTION/
PHASE 1 CONSTRUCTION
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

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

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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

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Attachment F
Six-Week Look-Ahead Schedule
(March 31 through May 11, 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	**3/31/2019**	**4/1/2019**	**4/2/2019**	**4/3/2019**	**4/4/2019**	**4/5/2019**	**4/6/2019**
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		Pipeline installation @ C5	Pipeline installation @ C5, C4	Pipeline installation @ C5, C4	Pipeline installation @ C5, C4	Pipeline installation @ C5, C4	
Pipeline C Access Road Installation E5					Access road installation @ C5	Access road installation @ C5	
Well Installation	IRZ-39 pilot (F5), RB-5 site prep (F5), MW-10D (G5), MW-M (F5), IRZ-20 (E5)	RB-5 site prep (F5), MW-10D (G5), MW-M (F5), IRZ-20 (E5)	RB-5 site prep (F5), MW-10D (G5), MW-M (F5), IRZ-20 (E5)	RB-5 site prep (F5), MW-10D (G5), MW-M (F5), IRZ-20 (E5)	RB-5 site prep (F5), MW-10D (G5), MW-M (F5), IRZ-20 (E5)		
Well Development	MW-L (F5), MW-B (E5), MW-N (F5)	MW-N (F5)	MW-N (F5)	MW-N (F5)	MW-N (F5)		
IM3 Brine Tank Upgrade (E5)	Continued brine tank upgrades - forming					Continued brine tank upgrades - tasks TBD	Continued brine tank upgrades - tasks TBD
Primary Planned Activities	**4/7/2019**	**4/8/2019**	**4/9/2019**	**4/10/2019**	**4/11/2019**	**4/12/2019**	**4/13/2019**
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		Pipeline installation @ C5, C4	Pipeline installation @ C5, C4	Pipeline installation @ C5, C4, C3	Pipeline installation @ C5, C4, C3	Pipeline installation @ C5, C4, C3	
Pipeline C Access Road Installation E5		Access road installation @ C5	Access road installation @ C5			Access road installation @ C5	
CHQ Construction E1		Rip Rap Installation	Rip Rap Installation	Rip Rap Installation	Rip Rap Installation	Rip Rap Installation	
MW-U Traffic Control F2, F3, F4, F5, F6		**Tentative:** Traffic control setup at MW-U	**Tentative:** Traffic control setup at MW-U				
Well Installation			RB-5 site prep (F5), MW-10D (G5), MW-M (F5), IRZ-20 (E5)	RB-5 pilot (F5), MW-10D (G5), MW-M (F5), IRZ-21 (E5)	RB-5 pilot (F5), MW-10D (G5), MW-M (F5), IRZ-21 (E5)	RB-5 pilot (F5), MW-10D (G5), MW-M (F5), IRZ-21 (E5)	RB-5 pilot (F5), MW-U (G5), MW-M (F5), MW-S site prep (G5), IRZ-21 (E5)
Well Development							
IM3 Brine Tank Upgrade (E5)	Continued brine tank upgrades - tasks TBD					Continued brine tank upgrades - tasks TBD	Continued brine tank upgrades - tasks TBD
Primary Planned Activities	**4/14/2019**	**4/15/2019**	**4/16/2019**	**4/17/2019**	**4/18/2019**	**4/19/2019**	**4/20/2019**
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		Pipeline installation @ C5, C4, C3	Pipeline installation @ C5, C4, C3	Pipeline installation @ C5, C4, C3	Pipeline installation @ C5, C4, C3	Pipeline installation @ C5, C4, C3	
Pipeline C Access Road Installation E5		Access road installation @ C5	Access road installation @ C5			Access road installation @ C5	
CHQ Construction E1		Grading and Surface Prep	Grading and Surface Prep	Grading and Surface Prep	Grading and Surface Prep	Grading and Surface Prep	
Well Installation	RB-5 pilot (F5), RB-4 site prep (F5) MW-U (G5), MW-M (F5), MW-S site prep (G5), IRZ-21 (E5)	RB-5 pilot (F5), RB-4 site prep (F5) MW-U (G5), MW-M (F5), MW-S site prep (G5), IRZ-21 (E5)	RB-5 pilot (F5), RB-4 site prep (F5) MW-U (G5), MW-M (F5), MW-S site prep (G5), IRZ-21 (E5)	RB-4 pilot (F5) MW-U (G5), MW-M (F5), MW-S site prep (G5), IRZ-21 (E5)	RB-4 pilot (F5) MW-U (G5), MW-M (F5), MW-S site prep (G5), IRZ-21 (E5)	--	--
IM3 Brine Tank Upgrade (E5)	Continued brine tank upgrades - tasks TBD	Continued brine tank upgrades - tasks TBD	Continued brine tank upgrades - tasks TBD			Continued brine tank upgrades - tasks TBD	Continued brine tank upgrades - tasks TBD
Primary Planned Activities	**4/21/2019**	**4/22/2019**	**4/23/2019**	**4/24/2019**	**4/25/2019**	**4/26/2019**	**4/27/2019**
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		Pipeline installation @ C5, C4, C3	Pipeline installation @ C5, C4, C3	Pipeline installation @ C5, C4, C3	Pipeline installation @ C5, C4, C3	Pipeline installation @ C5, C4, C3	
Pipeline C Access Road Installation E5		Access road installation @ C5	Access road installation @ C4			Access road installation @ C4	
CHQ Construction E1		Grading and Surface Prep	Grading and Surface Prep	Grading and Surface Prep	Grading and Surface Prep	Grading and Surface Prep	
Well Installation	--	--	RB-4 pilot (F5) MW-U (G5), MW-S (G5), IRZ-25 (E5)	RB-4 pilot (F5) MW-U (G5), MW-S (G5), IRZ-25 (E5)	RB-4 pilot (F5) MW-U (G5), MW-S (G5), IRZ-25 (E5)	RB-4 pilot (F5) MW-U (G5), MW-S (G5), IRZ-25 (E5)	RB-4 pilot (F5), RB-3 site prep (F5) MW-U (G5), MW-S (G5), IRZ-25 (E5)
IM3 Brine Tank Upgrade (E5)	Continued brine tank upgrades - tasks TBD					Continued brine tank upgrades - tasks TBD	Continued brine tank upgrades - tasks TBD
Primary Planned Activities	**4/28/2019**	**4/29/2019**	**4/30/2019**	**5/1/2019**	**5/2/2019**	**5/3/2019**	**5/4/2019**
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		Pipeline installation @ C5, C4, C3	Pipeline installation @ C5, C4, C3	Pipeline installation @ C5, C4, C3	Pipeline installation @ C5, C4, C3	Pipeline installation @ C5, C4, C3	
Pipeline C Access Road Installation E5		Access road installation @ C4	Access road installation @ C4			Access road installation @ C4	
Utility Clearance - NTH shoulder F5		**Tentative:** Frontier utility clearance	**Tentative:** Frontier utility clearance	**Tentative:** Frontier utility clearance	**Tentative:** Frontier utility clearance	**Tentative:** Frontier utility clearance	
Well Installation	RB-4 pilot (F5), RB-3 site prep (F5) MW-U (G5), MW-S (G5), IRZ-25 (E5)	RB-3 (F5) MW-U (G5), MW-S (G5), IRZ-25 (E5)	RB-3 (F5) MW-U (G5), MW-S (G5), IRZ-25 (E5)	RB-3 (F5) MW-U (G5), MW-S (G5), IRZ-25 (E5)	RB-3 (F5), MW-U (G5), MW-R site prep (F5), MW-S (G5), IRZ-25 (E5)	--	--
IM3 Brine Tank Upgrade (E5)	Continued brine tank upgrades - tasks TBD					Continued brine tank upgrades - tasks TBD	Continued brine tank upgrades - tasks TBD
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		Pipeline installation @ C5, C4, C3	Pipeline installation @ C5, C4, C3	Pipeline installation @ C5, C4, C3	Pipeline installation @ C5, C4, C3	Pipeline installation @ C5, C4, C3	
Pipeline C Access Road Installation E5		Access road installation @ C4	Access road installation @ C4			Access road installation @ C4	
Utility Clearance - NTH shoulder F5		**Tentative:** Frontier utility clearance	**Tentative:** Frontier utility clearance	**Tentative:** Frontier utility clearance	**Tentative:** Frontier utility clearance	**Tentative:** Frontier utility clearance	
Well Installation	--	--	RB-3 (F5), MW-U (G5), MW-R site prep (F5), MW-S (G5), IRZ-25 (E5)	RB-3 (F5), MW-R (F5), MW-S (G5), IRZ-25 (E5)	RB-3 (F5), MW-R (F5), MW-S (G5), IRZ-25 (E5)	RB-3 (F5), MW-R (F5), MW-S (G5), IRZ-25 (E5)	RB-3 (F5), MW-R (F5), MW-S (G5), IRZ-25 (E5)
IM3 Brine Tank Upgrade (E5)	Continued brine tank upgrades - tasks TBD					Continued brine tank upgrades - tasks TBD	Continued brine tank upgrades - tasks TBD

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.

ARCADIS Design & Consultancy for natural and built assets

GMP 2019-02 Sampling

						Lab:	ASSET	ASSET	ASSET	ASSET	ASSET	ASSET	ASSET	ASSET	ASSET	ASSET	ASSET	ASSET	ASSET
						Description:	Alkalinity, total as CaCO3	Arsenic, dissolved	Bromide	Chloride	Chromium, Hexavalent	Chromium, total dissolved	Manganese, dissolved	Molybdenum, dissolved	Nitrate/Nitrite as Nitrogen SM 4500-NO3 F	Selenium, dissolved	Specific conductance	Sulfate	Total dissolved solids
						Method:	SM 2320 B	SW 6020	EPA 300.0	EPA 300.0	EPA 218.6	SW 6020	SW 6020	SW 6020		SW 6020	EPA 120.1	EPA 300.0	SM 2540 C
						Unit:	mg/L	ug/L	mg/L	mg/L	ug/L	ug/L	ug/L	ug/L	mg/L	ug/L	uS/cm	mg/L	mg/L
Location	Sample Type	Sample ID	Parent Sample Code	Matrix	Field Comment	Date Sampled													
MW-34-100	N	MW-34-100-Q119		GW		02/14/2019		1.4			ND (1.0)	1.7	110	62	ND (0.05)	ND (0.5)	11,000		
MW-38S	N	MW-38S-Q119		GW		02/13/2019		6			5.1	5.6	57	32	3.8	2.6	1,600		
MW-38S	N	MW-38S-SMT-Q119		GW		02/15/2019		6.3			3.7	3.8	75	30	4.5	3.7	1,600		
MW-44-115	N	MW-44-115-Q119		GW		02/15/2019		6			9.7	17	13	100	0.062	ND (0.5)	11,000		
MW-46-175	N	MW-46-175-Q119		GW		02/15/2019					8.1	18		190	1.2	0.69	18,000		
MW-46-175	FD	MW-902-Q119	MW-46-175-Q119	GW		02/15/2019					7.9	20		200	1.2	0.63	18,000		
MW-57-050	N	MW-57-050-Q119		GW	Dry	02/14/2019													
MW-58-065	N	MW-58-065-Q119		GW	Dry	02/14/2019													
MW-58BR	N	MW-58BR-Q119		GW		02/14/2019		1.7			7.4	9.4	320	26	0.61	1.8	8,300		
MW-60BR-245	N	MW-60BR-245-3V-Q119		GW		02/14/2019		7.3			110	110	13	57	0.27	2.1	16,000		
MW-60BR-245	N	MW-60BR-245-LF_D-Q119		GW		02/14/2019		6.6			18	17	21	62	0.18	2.2	16,000		
MW-60BR-245	N	MW-60BR-245-LF_S-Q119		GW		02/14/2019		7.3			25	29	21	63	0.18	2.9	16,000		
MW-62-065	N	MW-62-065-Q119		GW		02/11/2019		1.7			470	550	2.5	16	4.7	4.6	6,100		
MW-62-110	N	MW-62-110-Q119		GW		02/14/2019		13			ND (1.0)	ND (1.0)	140	69	0.28	1.1	11,000		
MW-63-065	N	MW-63-065-Q119		GW		02/14/2019		1.6			1.1	1.3	22	18	0.77	0.83	6,600		
MW-64BR	N	MW-64BR-Q119		GW		02/13/2019		4.1			ND (1.0)	ND (1.0)	940	65	ND (0.05)	ND (0.5)	13,000		
MW-65-160	N	MW-65-160-Q119		GW		02/13/2019		0.76			220	220	ND (0.5)	42	15	11	3,800		
MW-65-225	N	MW-65-225-Q119		GW		02/13/2019		2.2			490	490	12	28	9.4	8.2	8,700		
MW-68-180	N	MW-68-180-Q119		GW		02/13/2019		2.6			37,000	42,000	ND (0.5)	46	33	21	5,000		
MW-69-195	N	MW-69-195-Q119		GW		02/13/2019		2.4			110	100	1	70	12	9.4	2,800		
MW-72-080	N	MW-72-080-Q119		GW		02/11/2019		11			77	92	48	83	0.74	1.2	16,000		
MW-72BR-200	N	MW-72BR-200-3V-Q119		GW		02/12/2019		16			5.3	5.4	43	85	0.13	ND (0.5)	14,000		
MW-72BR-200	N	MW-72BR-200-LF_D-Q119		GW		02/12/2019		11			ND (1.0)	ND (1.0)	140	82	ND (0.05)	ND (0.5)	14,000		
MW-72BR-200	N	MW-72BR-200-LF_S-Q119		GW		02/12/2019		12			ND (1.0)	1.3	140	82	0.072	ND (0.5)	14,000		
MW-73-080	N	MW-73-080-Q119		GW		02/11/2019		1.5			29	34 J	20	38	2.8	3.4	12,000		
TW-02D	N	TW-02D-Q119		GW		02/14/2019	85		ND (2.5)	1,200	120	140	4.6 J	11		2.4	4,300	260	2,500
TW-02D	FD	MW-901-Q119	TW-02D-Q119	GW		02/14/2019	85		ND (2.5)	1,200	120	130	11 J	11		2.2	4,200	260	2,500

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PMP 2019-02 Sampling

					Lab:	ASSET	ASSET	ASSET	ASSET	ASSET	ASSET	ASSET	ASSET	ASSET	ASSET	ASSET	ASSET	ASSET	ASSET
					Description:	Alkalinity, total as CaCO3	Calcium, dissolved	Chloride	Chromium, Hexavalent	Chromium, total dissolved	Iron, dissolved	Magnesium, dissolved	Manganese, dissolved	Nitrate/Nitrite as Nitrogen	pH	Sodium, dissolved	Specific conductance	Sulfate	Total dissolved solids
					Method:	SM 2320 B	EPA 200.7	EPA 300.0	EPA 218.6	EPA 200.8	EPA 200.7	EPA 200.7	EPA 200.8	SM 4500-NO3 F	SM 4500-H+ B	EPA 200.7	EPA 120.1	EPA 300.0	SM 2540 C
					Unit:	mg/L	mg/L	mg/L	ug/L	ug/L	ug/L	mg/L	ug/L	mg/L	PHUNITS	mg/L	uS/cm	mg/L	mg/L
Location	Sample Type	Sample ID	Matrix	Field Comment	Date Sampled														
PE-01	N	PE-01-0219	GW		02/14/2019	210	130	460	ND (0.2)	ND (1.0)	ND (20)	32	500	ND (0.05)	7.3	260	2,200	260	1,400
TW-03D	N	TW-03D-0219	GW		02/14/2019	160	220	2,200	420	520	ND (20)	31	18	2.8	7.2	1,400	7,600	520	4,300

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RMP 2019-02 SURFACEWAT Sampling

						Lab:	ASSET	ASSET	ASSET	ASSET	ASSET	ASSET	ASSET	ASSET	ASSET	ASSET	ASSET	ASSET	ASSET
						Description:	Arsenic, dissolved	Barium, dissolved	Chromium, Hexavalent	Chromium, total dissolved	Iron	Iron, dissolved	Manganese, dissolved	Molybdenum, dissolved	Nitrate/Nitrite as Nitrogen	pH	Selenium, dissolved	Specific conductance	Total Suspended Solids (TSS)
						Method:	SW 6020	SW 6020	EPA 218.6	SW 6020	SW 6010B	SW 6010B	SW 6020	SW 6020	SM 4500-NO3 F	SM 4500-H+ B	SW 6020	EPA 120.1	SM 2540 D
						Unit:	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	PHUNITS	ug/L	uS/cm	mg/L
Location	Sample Type	Sample ID	Parent Sample Code	Matrix	Field Comments	Date Sampled													
AMBIENTBLANK	AB	AMBIENTBLANK-1-0219		GW		02/12/2019			ND (0.2)										
AMBIENTBLANK	AB	AMBIENTBLANK-2-0219		GW		02/12/2019			ND (0.2)										
AMBIENTBLANK	AB	AMBIENTBLANK-3-0219		GW		02/13/2019			ND (0.2)										
C-BNS	N	C-BNS-0219		GW		02/12/2019	2.1	120	ND (0.2)	ND (1.0)	37	ND (20)	ND (0.5)	5	0.39	8.3	1.8	890	ND (5.0)
C-CON-D	N	C-CON-D-0219		GW		02/13/2019	2.2	110	ND (0.2)	ND (1.0)	140 J	ND (20)	ND (0.5)	4.5	0.39	8.3	1.7	900	ND (5.0)
C-CON-S	N	C-CON-S-0219		GW		02/13/2019	2.2	110	ND (0.2)	ND (1.0)	36	ND (20)	ND (0.5)	5	7.2	8.2	1.8	900	ND (5.0)
C-I-3-D	N	C-I-3-D-0219		GW		02/12/2019	2.1	110	ND (0.2)	ND (1.0)	23	ND (20)	ND (0.5)	4.8	0.35	8.3	2.1	870	ND (5.0)
C-I-3-S	N	C-I-3-S-0219		GW		02/12/2019	2	120	ND (0.2)	ND (1.0)	ND (20)	ND (20)	ND (0.5)	5	0.36	8.3	1.7	860	ND (5.0)
C-I-3-S	FD	MW-906-Q119	C-I-3-S-0219	GW		02/12/2019	2.2	110	ND (0.2)	ND (1.0)	ND (20)	ND (20)	ND (0.5)	4.8	0.39	8.3	1.4	860	ND (5.0)
C-MAR-D	N	C-MAR-D-0219		GW		02/13/2019	2.3	110	ND (0.2)	ND (1.0)	340	57	2.9	4.9	0.36	8.3	2	910	30
C-MAR-S	N	C-MAR-S-0219		GW		02/13/2019	2.3	120	ND (0.2)	ND (1.0)	81	25	1.8	5.2	0.37	8.3	1.7	910	ND (5.0)
C-NR1-D	N	C-NR1-D-0219		GW		02/13/2019	2.2	120	ND (0.2)	ND (1.0)	170	24	ND (0.5)	5	0.39	8.2	1.7	900	ND (5.0)
C-NR1-S	N	C-NR1-S-0219		GW		02/13/2019	2.1	120	ND (0.2)	ND (1.0)	ND (20)	ND (20)	ND (0.5)	5	0.38	8.2	1.8	910	ND (5.0)
C-NR3-D	N	C-NR3-D-0219		GW		02/13/2019	2.1	120	ND (0.2)	ND (1.0)	37	ND (20)	ND (0.5)	4.8	0.37	8.3	1.7	920	ND (5.0)
C-NR3-S	N	C-NR3-S-0219		GW		02/13/2019	2.1	120	ND (0.2)	ND (1.0)	22	ND (20)	ND (0.5)	5	0.39	8.2	1.7	910	ND (5.0)
C-NR3-S	FD	MW-907-Q119	C-NR3-S-0219	GW		02/13/2019	2.2	120	ND (0.2)	ND (1.0)	23	26	ND (0.5)	5.1	0.39	8.3	1.5	910	ND (5.0)
C-NR4-D	N	C-NR4-D-0219		GW		02/13/2019	2	120	ND (0.2)	ND (1.0)	22	ND (20)	ND (0.5)	5	0.41	7.8	1.5	910	ND (5.0)
C-NR4-S	N	C-NR4-S-0219		GW		02/13/2019	2.1	110	ND (0.2)	ND (1.0)	ND (20)	ND (20)	ND (0.5)	4.7	0.4	8.2	1.6	900	ND (5.0)
C-R22A-D	N	C-R22A-D-0219		GW		02/12/2019	2.1	120	ND (0.2)	ND (1.0)	42	26	ND (0.5)	4.8	0.34	8.3	1.5	880	ND (5.0)
C-R22A-S	N	C-R22A-S-0219		GW		02/12/2019	1.9	120	ND (0.2)	ND (1.0)	46	22	ND (0.5)	4.8	0.36	8.3	1.5	870	ND (5.0)
C-R27-D	N	C-R27-D-0219		GW		02/12/2019	2.1	120	ND (0.2)	ND (1.0)	24	26	ND (0.5)	5.1	0.33	8.3	2	880	ND (5.0)
C-R27-S	N	C-R27-S-0219		GW		02/12/2019	2.1	120	ND (0.2)	ND (1.0)	63	ND (20)	ND (0.5)	5	0.33	7.1	1.6	900	ND (5.0)
C-TAZ-D	N	C-TAZ-D-0219		GW		02/12/2019	2.3	120	ND (0.2)	ND (1.0)	22	21	ND (0.5)	5.4	0.35	8.3	2.1	860	ND (5.0)
C-TAZ-D	FD	MW-908-Q119	C-TAZ-D-0219	GW		02/12/2019	2.2	120	ND (0.2)	ND (1.0)	29	ND (20)	ND (0.5)	5	0.32	8.3	1.9	880	ND (5.0)
C-TAZ-S	N	C-TAZ-S-0219		GW		02/12/2019	2.2	110	ND (0.2)	ND (1.0)	ND (20)	ND (20)	ND (0.5)	5.2	0.36	8	1.9	880	ND (5.0)
R-19	N	R-19-0219		GW		02/13/2019	2.1	120	ND (0.2)	ND (1.0)	36	ND (20)	ND (0.5)	5	0.39	8.3	1.8	910	ND (5.0)
R-28	N	R-28-0219		SURFACEWAT		02/12/2019	2.1	120	ND (0.2)	ND (1.0)	160	ND (20)	ND (0.5)	5.1	0.32	6.8	2	930	31
R63	N	R63-0219		GW		02/12/2019	2.1	120	ND (0.2)	ND (1.0)	25	ND (20)	ND (0.5)	5	0.35	8.3	1.1	870	ND (5.0)
RRB	N	RRB-0219		GW		02/13/2019	2.2	120	ND (0.2)	ND (1.0)	24	22	1.9	5.3	0.33	7.6	1.8	930	ND (5.0)
SW1	N	SW1-0219		GW		02/12/2019			ND (0.2)	ND (1.0)						7.6		960	
SW2	N	SW2-0219		GW		02/12/2019			ND (0.2)	ND (1.0)						7.6		960	