



Pacific Gas  
and  
Electric  
Company

Iain Baker  
Chromium Remediation Manager

77 Beale Street, B28P  
San Francisco, CA 94105  
(415) 314-8530  
ixbj@pge.com

September 28, 2022

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

**Subject:** *Second Quarter 2022 Well Performance Report, PG&E Topock Compressor Station, Needles, California (PGE20180115A)*

Dear Mr. Yue:

Enclosed is the Second Quarter 2022 Well Performance Report for the Pacific Gas and Electric Company (PG&E) Topock Compressor Station located in Needles, California (the Site). In December 2021, startup began for Phase 1 of the groundwater remedy system, including start of National Trails Highway in-situ reactive zone (IRZ) system operation, maintenance, and monitoring to address hexavalent chromium in groundwater. Full and continuous operation of the IRZ injection and extraction wells using Topock Compressor Station power continued in Second Quarter 2022 (April through June 2022). Period planned and unplanned downtime occurred throughout the quarter.

In accordance with the reporting requirements outlined in the Basis of Design Report/Final (100%) Design Submittal, this well performance report presents an overview of the groundwater remedy and well maintenance objectives; a summary of Second Quarter 2022 well operations, maintenance, and performance monitoring activities; and recommendations and planned activities for the next reporting period.

Please contact me at (415) 314-8530 if you have any questions about the well performance report.

Sincerely,

Iain Baker  
Chromium Remediation Manager

Cc: Chris Guerre/DTSC  
Veronica Dickerson/DOI  
Ken Foster/CA-SLC  
Bruce Campbell/AZ-SLD

# Topock Project Executive Abstract

<b>Document Title:</b>	Second Quarter 2022 Well Performance Report, PG&E Topock Compressor Station, Needles CA
<b>Submitting Agency:</b>	DTSC and DOI
<b>Final Document?</b>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<b>Date of Document:</b>	September 28, 2022
<b>Who created this document?: (i.e. PG&amp;E, DTSC, DOI, Other)</b>	PG&E
<b>Priority Status:</b>	<input type="checkbox"/> HIGH <input type="checkbox"/> MED <input checked="" type="checkbox"/> LOW
<b>Is this time critical?</b>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<b>Type of Document:</b>	<input type="checkbox"/> Draft <input checked="" type="checkbox"/> Report <input type="checkbox"/> Letter <input type="checkbox"/> Memo <input type="checkbox"/> Other / Explain:
<b>Action Required:</b>	<input checked="" type="checkbox"/> Information Only <input type="checkbox"/> Review & Comment Return to: _____ By Date: _____ <input type="checkbox"/> Other / Explain:
<b>What does this information pertain to?</b>	<input type="checkbox"/> Resource Conservation and Recovery Act (RCRA) Facility Assessment (RFA)/Preliminary Assessment (PA) <input type="checkbox"/> RCRA Facility Investigation (RFI)/Remedial Investigation (RI) (including Risk Assessment) <input type="checkbox"/> Corrective Measures Study (CMS)/Feasibility Study (FS) <input checked="" type="checkbox"/> Corrective Measures Implementation (CMI)/Remedial Action <input type="checkbox"/> California Environmental Quality Act (CEQA)/Environmental Impact Report (EIR) <input type="checkbox"/> Interim Measures <input type="checkbox"/> Other / Explain:
<b>Is this a regulatory requirement?</b>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If no, why is the document needed?
<b>What is the consequence of NOT doing this item? What is the consequence of DOING this item?</b>	Submittal of this report is a compliance requirement under DTSC and DOI requirements.
<b>Other Justification/s:</b>	<input type="checkbox"/> Permit <input type="checkbox"/> Other / Explain:
<b>Brief Summary of Attached Document:</b>	<p>In December 2021, startup began for Phase 1 of the groundwater remedy system, including start of National Trails Highway in-situ reactive zone (IRZ) system operation, maintenance, and monitoring to address hexavalent chromium in groundwater. Full and continuous operation of the IRZ injection and extraction wells using Topock Compressor Station power continued in Second Quarter 2022 (April through June 2022). Period planned and unplanned downtime occurred throughout the quarter. In accordance with the reporting requirements outlined in the Basis of Design Report/Final (100%) Design Submittal, this well performance report presents an overview of the groundwater remedy and well maintenance objectives; a summary of Second Quarter 2022 well operations, maintenance, and performance monitoring activities; and recommendations and planned activities for the next reporting period.</p> <p>Written by: PG&amp;E</p>
<b>Recommendations:</b>	None.
<b>How is this information related to the Final Remedy or Regulatory Requirements?:</b>	This report is required by DTSC and DOI as part of the Basis of Design Report/Final (100%) Design Submittal for the Final Groundwater Remedy.

<b>Other requirements of this information?:</b>	None.
<b>Related Reports and Documents:</b>	<p>Click any boxes in the Regulatory Road Map (below) to be linked to the Documents Library on the DTSC Topock Web Site (<a href="http://www.dtsc-topock.com">www.dtsc-topock.com</a>).</p> <pre> graph LR     RFA[RFPA] --&gt; RFI[RFI/RI&lt;br/&gt;(Incl. Risk Assessment)]     RFI --&gt; CEQA[CEQA/EIR]     CEQA --&gt; CMS[CMS/FS]     CMS --&gt; CMI[Corrective Measures Implementation (CMI)/&lt;br/&gt;Remedial Action]     CMI --&gt; CA[Corrective Action Completion/&lt;br/&gt;Remedy in Place]     IM[Interim Measures] --&gt; CMS     CMS --&gt; RFA     </pre> <p><b>Legend</b></p> <p>RFA/PA – RCRA Facility Assessment/Preliminary Assessment      RFI/RI – RCRA Facility Investigation/CERCLA Remedial Investigation (including Risk Assessment)      CMS/FS – RCRA Corrective Measure Study/CERCLA Feasibility Study      CEQA/EIR – California Environmental Quality Act/Environmental Impact Report</p>

Version 9



Pacific Gas and Electric Company

# **Second Quarter 2022 Well Performance Report**

**Topock Compressor Station  
Needles, California**

September 28, 2022

# Second Quarter 2022 Well Performance Report

**Topock Compressor Station**

**Needles, California**

September 28, 2022

**Prepared By:**

Arcadis U.S., Inc.  
100 Montgomery Street  
Suite 300  
San Francisco  
California 94104  
Phone: 415 374 2744  
Fax: 415 374 2745

**Our Ref:**

30121866



---

Kimberly Wojcik  
Arcadis Report Lead



---

Margaret Gentile, PhD, PE No. 77488  
Principal Engineer



---

Treck Hohman  
Arcadis Project Manager

## Contents

<b>Acronyms and Abbreviations.....</b>	<b>iv</b>
<b>1      Introduction.....</b>	<b>1</b>
<b>2      NTH IRZ Well Maintenance Program .....</b>	<b>3</b>
2.1     Routine Maintenance.....	3
2.2     Long-Term Performance Tracking.....	3
2.2.1    Specific Capacity Monitoring .....	4
2.2.2    Water Quality Monitoring .....	5
<b>3      NTH IRZ Well Performance .....</b>	<b>6</b>
3.1     System Operation Summary .....	6
3.2     NTH IRZ Extraction Well Performance .....	6
3.2.1    Extraction Well O&M and Specific Capacity Summary .....	6
3.2.2    Extraction Well Water Quality .....	7
3.3     NTH IRZ Injection Well Performance .....	8
3.3.1    Injection Well O&M and Specific Capacity Summary .....	8
3.3.2    Injection Well Water Quality .....	9
<b>4      Monitoring Well Performance.....</b>	<b>10</b>
<b>5      Recommendations and Planned Activities for Next Reporting Period.....</b>	<b>12</b>
<b>6      References .....</b>	<b>13</b>

## Exhibits (in text)

- Exhibit 2.1.     Routine Maintenance Matrix for Injection and Extraction Wells
- Exhibit 2.2.     Performance Monitoring Frequencies
- Exhibit 3.1.     Second Quarter 2022 NTH IRZ Extraction Well Analytical Results

## Tables

- Table 3.1.     Summary of NTH IRZ Well Operations
- Table 3.2.     NTH IRZ System Operations and Non-Routine Maintenance Log
- Table 3.3.     Summary of NTH IRZ Well Specific Capacities

- Table 3.4. NTH IRZ Baseline Sampling Results (provided in the First Quarter 2022 Well Performance Report)
- Table 3.5. Second Quarter 2022 Field Parameters
- Table 4.1. Monitoring Well Inspection Results
- Table 4.2. Monitoring Well Water Levels and Specific Capacities

## Figures

- Figure 1.1. Partial Remedy System Layout
- Figure 3.1. Extraction Well Specific Capacity Trends
- Figure 3.2. Injection Well Specific Capacity Trends
- Figure 4.1. Monitoring Well Network

## Acronyms and Abbreviations

Agencies	U.S. Department of the Interior and the California Department of Toxic Substances Control
CH2M Hill	CH2M Hill, Inc.
DOI	U.S. Department of the Interior
DTSC	California Department of Toxic Substances Control
Final BOD	Basis of Design Report/Final (100%) Design Submittal and Construction/Remedial Action Work Plan for the Final Groundwater Remedy
IRZ	in-situ reactive zone
NTH	National Trails Highway
O&M	operation and maintenance
PG&E	Pacific Gas and Electric Company
Site	PG&E Topock Compressor Station, located in eastern San Bernardino County, 15 miles southeast of the City of Needles, California
TCS	Topock Compressor Station

# 1 Introduction

Pacific Gas and Electric Company (PG&E) is implementing a final groundwater remedy to address hexavalent 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 Site). PG&E is implementing the groundwater remedy at the TCS in conformance with the requirements of the Resource Conservation and Recovery Act and the Comprehensive Environmental Response, Compensation, and Liability Act. The U.S. Department of the Interior (DOI) and the California Department of Toxic Substances Control (DTSC), collectively known as the Agencies, executed a Memorandum of Understanding on November 22, 2011, which established coordination guidelines for overseeing implementation of a groundwater response action at the TCS (DTSC and DOI 2011). In a coordinated effort, the DOI and DTSC selected the final groundwater remedy to address chromium in groundwater, which is presented in the Record of Decision (DOI 2010).

In November 2015, PG&E submitted a Basis of Design Report/Final (100%) Design Submittal (Final BOD), which presents the final design basis, design criteria, drawings, specifications, and operation and maintenance (O&M) requirements for the groundwater remedy (CH2M Hill, Inc. [CH2M Hill] 2015a). The infrastructure for the groundwater remedy is being constructed following the plans and procedures within the Construction/Remedial Action Work Plan (CH2M Hill 2015b). Construction and startup of the groundwater remedy is proceeding in phases.

Construction of Phase 1 began in October 2018 and was completed in December 2021 sufficient for initial system startup. The design was modified during construction to accommodate conditions encountered including a plume footprint smaller than that documented in the Final BOD (CH2M Hill 2015a). As a result, the National Trails Highway (NTH) in-situ reactive zone (IRZ) system was installed with 10 fewer wells than planned in the Final BOD, with these 10 wells being deferred from Phase 1 to Phase 2 of construction.

The NTH IRZ is a recirculation system in which water is extracted from up to four NTH IRZ extraction wells, amended with carbon substrate, and injected into up to 25 NTH IRZ injection intervals. The NTH IRZ extraction wells include IRZ-9, IRZ-13S, IRZ-13D, and IRZ-23.

Injection well intervals include IRZ-15 (upper), IRZ-15 (lower), IRZ-16 (upper), IRZ-16 (lower), IRZ-17 (upper), IRZ-17 (lower), IRZ-18 (upper), IRZ-18 (lower), IRZ-20 (upper), IRZ-20 (lower), IRZ-21 (upper), IRZ-21 (lower), IRZ-25 (upper/upper middle), IRZ-25 (lower), IRZ-27 (upper/upper middle), IRZ-27 (lower), IRZ-29 (upper), IRZ-29 (lower), IRZ-31 (upper), IRZ-31 (lower), IRZ-33 (upper), IRZ-33 (lower), IRZ-35, IRZ-37, and IRZ-39.

A site layout, including locations of the extraction wells, the remedy-produced water conditioning system, and the carbon amendment system, is shown on Figure 1.1.

In December 2021, startup began for Phase 1 of the groundwater remedy system including the start of NTH IRZ system operation, maintenance, and monitoring. O&M are being performed in accordance with the O&M Manual (Appendix L, Volume 1; CH2M Hill 2015a). This report documents well maintenance and well performance and covers the period from April 1 to June 30, 2022 (the Second Quarter 2022). The remainder of this report is organized into the following sections:

- Section 2 provides an overview of the well maintenance program.
- Section 3 summarizes the well performance and maintenance for the NTH IRZ remedial wells.
- Section 4 summarizes monitoring well performance.

## Second Quarter 2022 Well Performance Report

- Section 5 provides recommendations for modifications to the well maintenance program and planned activities for the next reporting period.
- Section 6 provides the references for the documents cited throughout this report.

## 2 NTH IRZ Well Maintenance Program

The well maintenance program consists of routine maintenance and performance tracking including tracking well performance over time and collecting analytical data and conducting well inspections to evaluate well integrity over time. This section summarizes these activities.

### 2.1 Routine Maintenance

Well maintenance is incorporated into the routine operations of the NTH IRZ. Exhibit 2.1 in this section summarizes the initially planned maintenance for NTH IRZ wells. Injection wells are prone to fouling, as the injection of organic carbon stimulates the growth of bacteria, generation of gases such as carbon dioxide, and formation of mineral precipitates. To mitigate fouling due to these processes, routine maintenance plans include backwashing and mechanical and chemical rehabilitation. Injection well backwashing is executed by extraction of groundwater for a short period using a downhole pump to loosen and remove sediments and deposits present on the well screen or in the filter pack. Backwashing of injection wells is initially planned to occur weekly during operations. Mechanical rehabilitation physically agitates and removes dislodged and detached deposits. Chemical rehabilitation uses additives to remove deposits, for example through dissolution or by increasing solubility. Mechanical and chemical rehabilitation are planned to occur after periods of extended injection well operation and before planned, extended downtime (approximately every 6 months to 1.5 years). The frequencies of injection well rehabilitation that are initially planned are presented in Exhibit 2.1 in this section but may be increased in frequency or manner of application in response to well performance monitoring data as detailed in Section 2.2. Extraction wells are less prone to fouling and, as such, routine rehabilitation is not planned. The O&M Manual (Appendix L, Volume 1; CH2M Hill 2015a) recommended mechanical rehabilitation (i.e., pumping and surging) for routine maintenance as needed. Chemical rehabilitation may be warranted in some cases.

*Exhibit 2.1 Routine Maintenance Matrix for Injection and Extraction Wells*

Injection Well Backwashing Frequency	Injection Well Chemical/Mechanical Rehabilitation Frequency	Extraction Well Mechanical Rehabilitation Frequency
Weekly	6 months to 1.5 years	As needed

### 2.2 Long-Term Performance Tracking

The purpose of well performance tracking is to assess the frequency and methods required for well maintenance, report well performance trends, and identify potential performance declines within the IRZ system and monitoring wells. Routine preventative maintenance is performed regularly to aid in maintaining well health as described in Section 2.1. Long-term performance monitoring consists of specific capacity monitoring, water quality monitoring, and wellhead inspection. Exhibit 2.2 in this section presents the planned frequency of these activities, and specific capacity and water quality monitoring are detailed in the following subsections.

*Exhibit 2.2. Performance Monitoring Frequencies*

Performance Monitoring Activity	Injection Wells	Extraction Wells
Specific capacity evaluation	Monthly	Monthly
Water quality monitoring	Baseline, then as needed	Baseline, as well as the following:  Monthly total organic carbon, manganese, iron, and field parameter screening in First Quarter through Second Quarter 2022, then quarterly for remainder of 2022, then semiannually in 2023, then annually or as needed thereafter.  Annual or as needed biological and geochemical sampling.  Annual or as needed biological activity tests, sand content tests, and modified fouling index tests.
Wellhead inspection	Quarterly	Quarterly

**Notes:**

1. Field parameter screening includes temperature, pH, specific conductance, turbidity, dissolved oxygen, and oxidation reduction potential.
2. Biological and geochemical sampling parameters for extraction wells include total organic carbon, total dissolved solids, iron and manganese (total and dissolved), calcium, potassium, magnesium, sodium (total), chloride, fluoride, bromide, nitrate, nitrite, sulfate, alkalinity (total, carbonate, and bicarbonate), and hardness as calcium carbonate. Parameters measured during baseline only include Title 22 metals (total and dissolved), sulfide, phosphate, total phosphorus, silica, ammonia as nitrogen, total Kjeldahl nitrogen, and biochemical oxygen demand.

## 2.2.1 Specific Capacity Monitoring

One measure that will be used in the assessment of well performance is a specific capacity evaluation. The specific capacity for each extraction, injection, and monitoring well is determined by the rate of extraction or injection per unit of drawdown or draw up in the well. Mathematically, this is calculated using the following equation:

$$\text{Specific Capacity} \left( \frac{\text{gpm}}{\text{ft}} \right) = \frac{\text{discharge rate (gpm)}}{\text{operating water level (ft)} - \text{static water level (ft)}}$$

As discussed in the First Quarter 2022 Well Performance Report (Arcadis 2022a), baseline specific capacities are determined for each extraction and injection well once the wells are operating consistently and the flowrates and water levels stabilize. Baseline capacities were established for wells that operated continuously for the majority of

Second Quarter 2022 including IRZ-13S, IRZ-13D, IRZ-16, IRZ-17, IRZ-18, IRZ-20, IRZ-23, IRZ-27, IRZ-29, IRZ-31, IRZ-33, IRZ-35, and IRZ-37. Extraction well IRZ-9 and injection wells IRZ-15, IRZ-21, IRZ-25, and IRZ-39 did not operate continuously in the Second Quarter 2022; therefore, sufficient data were not available to establish baselines for these wells in Second Quarter 2022.

Monthly average specific capacities are provided in Table 3.3. Static water levels were collected for each injection and extraction well during well development. There is a natural variation in static water level depending on time of year. To account for this natural variation, the static water levels collected before system operation were adjusted by the typically observed difference in water levels at time of development and in January, which is the month where water levels are at their lowest at the Site. Continuous operation of the NTH IRZ began on March 10, 2022; however, there were several system shutdowns associated with a storm event, transformer repairs, and TCS turning off power to the remedy based on station activities. The system was on with minimal interruption from May 20 through June 27, 2022, during which the operating injection and extraction wells equilibrated.

Accordingly, the equilibrated data from June were averaged and will be used as baseline and a reference point for comparison of future data to evaluate well performance. Specific capacity values may be affected by planned IRZ operational changes such as setting a new target flowrate. Where this occurs, baseline specific capacity values may be adjusted.

Starting in Third Quarter 2022, specific capacities for each well will be calculated monthly and compared to the baseline values to assess well performance decline over time. As presented in the O&M Manual (Appendix L, Volume 1; CH2M Hill 2015a), specific capacities greater than or equal to 90 percent of the baseline capacities will be classified as having good performance; specific capacities that fall between 80 and 90 percent of the baseline capacities will be classified as having fair performance; specific capacities below 80 percent of the baseline capacities will be classified as having poor performance. Specific capacities that fall below 80 to 90 percent of the baseline capacities will be flagged as needing evaluation and potential additional maintenance such as increasing the frequency of backwashing or rehabilitation. Specific capacity data collected during operations in First and Second Quarter 2022 are presented in Section 3.

## **2.2.2 Water Quality Monitoring**

Water quality monitoring, including field parameter collection and sampling, provides information on system status, which may help diagnose well clogging issues and provide information for designing corrective measures. Baseline water quality sampling included biological, geochemical, and field parameters as specified in Exhibits 4.1-1 and 4.1-2 of the O&M Manual (Appendix L, Volume 1; CH2M Hill 2015a). Additionally, extraction wells are sampled monthly, when operating, during the First Quarter as stated in the O&M Manual (Appendix L, Volumes 1 and 2; CH2M Hill 2015a) for extraction of constituents associated with in-situ injections including total organic carbon and dissolved metals. Samples were collected and analyzed according to standard operating procedures presented in Appendix B to the Phase 1 Interim Monitoring Plan (Arcadis 2021), and the PG&E Program Quality Assurance Project Plan (CH2M Hill 2014; Critigen 2020). Sample results are discussed in Sections 3.2.2 and 3.3.2 of this report.

## 3 NTH IRZ Well Performance

This section summarizes NTH IRZ system operational changes that occurred during the Second Quarter and discusses the baseline specific capacity evaluations and water quality monitoring for the extraction and injection wells conducted in Second Quarter 2022.

### 3.1 System Operation Summary

Operation using TCS power continued in Second Quarter 2022. System runtime, ethanol and recirculated groundwater injection volumes and flowrates, and average flowrates are summarized in Table 3.1. An IRZ system operations and non-routine maintenance log is presented as Table 3.2.

A notable operational change during Second Quarter 2022 was increasing the flowrates by approximately 50 percent for the injection wells along the southern forcemain (IRZ-27 [lower], IRZ-29, IRZ-31, IRZ-33, IRZ-35, and IRZ-37) to further influence development of an IRZ for hexavalent chromium treatment. Additionally, multiple planned and unplanned shutdowns occurred during Second Quarter 2022. One shutdown was planned in late June to repair transformers. Unplanned shutdowns were primarily due to TCS turning off power to the remedy based on other station activities.

### 3.2 NTH IRZ Extraction Well Performance

Extraction wells in Phase 1 of the groundwater remedy include IRZ-9, IRZ-13S, IRZ-13D, and IRZ-23. Extraction well runtime, including monthly average extraction well flowrates and average water levels, is documented in Table 3.1. A discussion of observed extraction well performance in Second Quarter 2022 is provided in the following subsections.

#### 3.2.1 Extraction Well O&M and Specific Capacity Summary

As described in Section 2.2.1 of this report, average specific capacities from June 2022 were established as the baseline specific capacities for extraction wells IRZ-23, IRZ-13S, and IRZ-13D and will be used to evaluate well performance and guide maintenance starting in Third Quarter 2022. Extraction well IRZ-9 was not evaluated because the well was not operating during Second Quarter 2022. Extraction well specific capacities calculated during Second Quarter 2022 are documented in Table 3.3. Graphs of average daily specific capacity for extraction wells IRZ-13S, IRZ-13D, and IRZ-23 during this period are presented on Figure 3.1.

In accordance with the Final BOD (CH2M Hill 2015a), routine maintenance of extraction wells could include pump and surge redevelopment as needed. No routine maintenance was performed on the extraction wells in Second Quarter 2022.

Extraction wells are inspected quarterly at minimum for visible leaks and damage. Any notable damage or equipment needing replacement is listed in Table 3.2. Leak detection switches within the vaults are also used as an additional measure to identify maintenance needs in a timely manner. No notable damage to extraction wells and/or non-routine maintenance occurred during Second Quarter 2022.

### 3.2.2 Extraction Well Water Quality

The potential for well fouling at IRZ extraction wells as the result of carbon injection is monitored during system operations. This monitoring includes measuring total organic carbon and metal byproducts for conditions that may generate well fouling. The Second Quarter 2022 Quarterly Progress Report (Arcadis 2022b) provides the extraction well monitoring analytical results; however, the results are also summarized and discussed herein.

Table 3.4 presented in the First Quarter 2022 Well Performance Report (Arcadis 2022a) shows the baseline and First Quarter analytical results from extraction wells IRZ-9, IRZ-23, IRZ-13S, and IRZ-13D. Baseline analytical data were collected during December 2021, January 2022, and March 2022, when extraction wells were brought online. Baseline analytical data were collected for each extraction well once all equipment for the well was installed and available for operation.

Exhibit 3.1 in this section presents the monthly analytical results from extraction wells IRZ-9, IRZ-23, IRZ-13S, and IRZ-13D for Second Quarter 2022 and includes the baseline analytical results as a reference. Total organic carbon, total iron, dissolved iron, and dissolved manganese concentrations were generally lower than the reporting limits, with several isolated exceptions. The isolated detections do not indicate a consistent trend that would be of concern for causing well fouling; therefore, no adjustments to operations were needed in Second Quarter 2022. Extraction well IRZ-9 was not operated in Second Quarter 2022. The extraction wells will continue to be monitored monthly in Third Quarter 2022.

#### *Exhibit 3.1. Second Quarter 2022 NTH IRZ Extraction Well Analytical Results*

Extraction Well	Sample Date	Active Time Operating (%)	Total Organic Carbon (mg/L)	Total Iron (mg/L)	Dissolved Iron (mg/L)	Dissolved Manganese (mg/L)
IRZ-9	Baseline: January 2022	9	Less than 1	Less than 0.02	Less than 0.02	0.0027
IRZ-9	April 2022	0	Less than 1	0.34	Less than 0.02	0.0018
IRZ-9	May 2022	0	Less than 1	0.14 J	Less than 0.02 J	Less than 0.0005
IRZ-9	June 2022	0	Less than 1	--	0.48 J	Less than 0.0005
IRZ-23	Baseline: December 2021	8	Less than 10	0.69	0.091 J	Less than 0.0005
IRZ-23	April 2022	75	Less than 1	0.13	Less than 0.02	Less than 0.0005
IRZ-23	May 2022	64	Less than 1	Less than 0.02	Less than 0.02	Less than 0.0005
IRZ-23	June 2022	88	Less than 1	--	Less than 0.02	Less than 0.0005
IRZ-13S	Baseline: March 2022	53	Less than 1	0.06	Less than 0.02	Less than 0.0005
IRZ-13S	April 2022	33	Less than 1	0.18	Less than 0.02	0.0029
IRZ-13S	May 2022	63	Less than 1	0.054 J	Less than 0.02 J	Less than 0.0005
IRZ-13S	June 2022	87	Less than 1	--	Less than 0.02	Less than 0.0005
IRZ-13D	Baseline: March 2022	53	Less than 1	Less than 0.02	0.059	0.062

Extraction Well	Sample Date	Active Time Operating (%)	Total Organic Carbon (mg/L)	Total Iron (mg/L)	Dissolved Iron (mg/L)	Dissolved Manganese (mg/L)
IRZ-13D	April 2022	31	Less than 1	0.63	Less than 0.02	0.028
IRZ-13D	May 2022	63	Less than 1	Less than 0.1 J	Less than 0.02 J	0.0025
IRZ-13D	June 2022	88	Less than 1	--	Less than 0.02 J	Less than 0.0005

**Notes:**

-- = not available

mg/L = milligram per liter

J = estimated concentration

Total iron was inadvertently not analyzed in June 2022.

Table 3.5 includes field parameter data for extraction wells IRZ-9, IRZ-13S, IRZ-13D, and IRZ-23 collected during Second Quarter 2022. Field parameter data collected include temperature, pH, specific conductance, turbidity, dissolved oxygen, and redox potential. Field parameters will be collected monthly for Third Quarter 2022.

### 3.3 NTH IRZ Injection Well Performance

Injection wells of the Phase 1 groundwater remedy include IRZ-15, IRZ-16, IRZ-17, IRZ-18, IRZ-20, IRZ-21, IRZ-25, IRZ-27, IRZ-29, IRZ-31, IRZ-33, IRZ-35, IRZ-37, and IRZ-39. Injection well runtime, including average well flowrates and average water levels, is documented in Table 3.1. A discussion of observed injection well performance in Second Quarter 2022 is provided in the following subsections.

#### 3.3.1 Injection Well O&M and Specific Capacity Summary

Injection wells IRZ-15, IRZ-21, and IRZ-25 remained offline during Second Quarter 2022. The remaining injection wells resumed operating following the March 29, 2022 storm event either on March 30, 2022 or during April 2022 after confirming equipment functionality. Operating periods of each injection well are provided in Table 3.2.

Routine operation for injection wells includes daily monitoring of injection well flowrates and water levels. Operational details are provided in Table 3.2. Corresponding injection well average monthly specific capacities, calculated from Second Quarter 2022 operational data, are documented in Table 3.3. Graphs of average daily specific capacities for injection wells operating during Second Quarter 2022 are plotted on Figure 3.2. As described in Section 2.2.1 of this report, average specific capacities from June 2022 were established as the baseline specific capacities for operating injection wells and will be used to evaluate well performance and guide maintenance starting in Third Quarter 2022.

Average specific capacities will continue to be monitored to evaluate well performance and guide maintenance in Third Quarter 2022. Additional data evaluation and establishment of baseline specific capacities for the remaining injection wells (IRZ-15, IRZ-21, IRZ-25, and IRZ-39) will occur once those wells have been operating continuously and specific capacities stabilize.

Routine injection well maintenance during Second Quarter 2022 included generally weekly backwashing of injection wells during system operation, as detailed in Table 3.2. Each operating injection well was backwashed to remove solids that may have accumulated in the well screen and gravel pack during injections.

Mechanical and chemical rehabilitation were not performed in Second Quarter 2022. Mechanical and chemical rehabilitation are planned to occur after extended injection well operation and before planned extended downtime.

Injection wells are inspected quarterly at minimum to inspect for visible leaks and damage. Any notable damage or equipment needing replacement is listed in Table 3.2. Leak detection switches within the vaults are also used as an additional measure to identify maintenance needs in a timely manner. Notable damage to injection wells and/or non-routine maintenance during Second Quarter 2022 included the following:

- In May 2022, the backwash pump and motor starter for IRZ-33 (upper) were replaced. Injection well IRZ-33 (upper) equipment had been damaged during the stormwater flooding event on March 29, 2022.
- In June 2022, IRZ-35 and IRZ-37 were offline to replace a damaged programmable logic controller and troubleshoot an inoperable backwash pump. Backwash pump was rewired and resumed operating.

### **3.3.2 Injection Well Water Quality**

The potential for well fouling at IRZ injection wells as the result of carbon injection is monitored during system operation. Table 3.4, presented in the First Quarter 2022 Well Performance Report (Arcadis 2022a), shows the baseline analytical results for each injection well. Baseline analytical data were collected during December 2021 and January 2022. Future analytical results will be collected as needed for fouling troubleshooting purposes.

## 4 Monitoring Well Performance

Monitoring wells are inspected to determine whether monitoring well maintenance, such as wellhead repair or well screen redevelopment, is needed. Monitoring well inspections include assessment of the following:

- Wellhead condition is assessed to determine if well protection features, including the well seal, well vault/protective casing, and concrete pad, are in place and functioning as designed.
- Turbidity indicates that the monitoring well screen and filter pack are intact and functioning.
- Depth to bottom of the well indicates infill (siltation).
- Specific capacity evaluation confirms consistency with sampling standard operating procedures.

This section provides a summary of each of these parameters. The locations of the monitoring wells inspected are shown on Figure 4.1.

**Wellhead condition.** Wellheads are inspected routinely during sampling, and observations are documented in the field tablet. The inspection results are presented in Table 4.1, and the issues that need to be addressed, such as missing bolts, are listed. Overall, the wells were in good condition in Second Quarter 2022. The minor issues identified will be addressed during a future sampling event.

A storm/flooding event occurred the evening of March 28, 2022. More than 1 inch of rain fell at the Site, resulting in partial washout of some of the well access paths. The condition of the monitoring wells was inspected shortly afterwards during the April sampling event, conducted during the week of April 11. The majority of the monitoring wells showed no evidence of damage or impacts due to flooding. Monitoring well MW-38S sustained minor damage. In July 2022, the well was repaired by installing a longer stick-up casing, re-cementing, and reinforcing the cement pad with rebar. Monitoring well MW-38D sustained no damage, but the concrete pad was reinforced with more cement. Both wells were resurveyed after the repairs were complete.

**Turbidity.** Turbidity data are presented in Table 3.5. In accordance with Section 4.2.4 of the O&M Manual (Appendix L, Volume 1; CH2M Hill 2015a), wells that consistently yield turbidity above the range of 20 to 30 nephelometric units will undergo additional evaluation to determine if redevelopment is warranted, potentially including evaluation of previous purge data, specific capacity, and longer-term pressure transducer data.

Monitoring well MW-67-185 yielded turbidity readings above 30 nephelometric units in May and June 2022.

Turbidity data for this well collected in 2021 following the tracer injection study indicate a pattern of high turbidity readings (up to 500 nephelometric units). Accordingly, this well will continue to be monitored, and redevelopment will be considered in Third Quarter.

**Depth to well bottom.** Monitoring well depth-to-bottom data are presented in Table 4.2. Depths to bottom are measured manually during sampling events using a water level meter and compared to the as-constructed well depth and bottom of the screened interval to assess siltation, integrity of the well screen, and integrity of the well casing. Monitoring wells with differences greater than 1 foot between the constructed well depth and measured well depth are flagged for further evaluation. If the measured well depth suggests that at least 20 percent of the screened interval is silted in, the well will be resurveyed and/or redeveloped.

The following monitoring wells were resurveyed on July 25, 2022 due to observed discrepancies between constructed and measured well depths while reviewing First and Second Quarter 2022 data: MW-20-70, MW-20-100, MW-20-130, MW-22, MW-38-D, and MW-38-S. Data presented in Table 4.2 include the resurveyed data.

**Specific capacity.** Purging data, including purge rate, drawdown, and calculated specific capacity, are presented in Table 4.2. Purging is conducted at rates between 100 and 500 milliliters per minute, and drawdown at these rates typically ranges from a few hundredths to a few tenths of a foot. If drawdown of greater than 1 foot is observed for a fluvial or alluvial well, the well will be flagged for further evaluation to determine if it needs rehabilitation. Bedrock wells are excluded from this evaluation method due to the potential for larger drawdown during purging. No wells were identified for potential rehabilitation in Second Quarter 2022 based on this criterion, except for MW-44-125 and MW-97-042. At monitoring well MW-44-125, more than 2 feet of drawdown was recorded during the May 2022 sampling event, but less than 1 foot of drawdown was recorded during the next sampling event in June 2022, indicating that this well does not need to be redeveloped. At monitoring well MW-97-042, approximately 1 foot of drawdown was recorded during the June 2022 sampling event. No rehabilitation is planned for MW-97-042 at this time; however, drawdown and purge rates for this well will be monitored for changes that would warrant rehabilitation during future sampling events.

## 5 Recommendations and Planned Activities for Next Reporting Period

Phase 1 groundwater remedy operations and the Phase 1 monitoring program will continue in Third Quarter 2022 (July to September 2022) in accordance with the O&M Manual (Appendix L, Volume 1; CH2M Hill 2015a) and Phase 1 Interim Monitoring Plan (Arcadis 2021). Arcadis does not recommend modifications to the well maintenance program for Third Quarter 2022.

In addition to routine groundwater remedy operations and monitoring, the following activities related to well performance are planned for Third Quarter 2022:

- Continue operation of target extraction and injection wells. Injection wells IRZ-15, IRZ-21, IRZ-25 and IRZ-39, along with extraction well IRZ-9, will remain offline.
- Continue quarterly extraction and injection well monitoring to evaluate the potential for well fouling of the IRZ injection wells.
- Continue weekly injection well backwashing during operation.
- Monitor average specific capacities for remedial and monitoring wells to determine if additional maintenance is needed.
- Continue quarterly inspections of sampled monitoring wells.

Well performance monitoring will be reported in a Third Quarter 2022 Well Performance Report. A Third Quarter 2022 Quarterly Progress Report will also be submitted to document operations and monitoring results in accordance with the O&M Manual (Appendix L, Volume 1; CH2M Hill 2015a).

## 6 References

- Arcadis. 2021. Groundwater Remedy Phase 1 Interim Monitoring Plan. Topock Compressor Station, Needles, California. October 1.
- Arcadis. 2022a. First Quarter 2022 Well Performance Report. PG&E Topock Compressor Station, Needles, California. June 30.
- Arcadis. 2022b. Second Quarter 2022 Quarterly Progress Report. PG&E Topock Compressor Station, Needles, California. September 2.
- CH2M Hill. 2014. Final PG&E Program Quality Assurance Project Plan. November.
- CH2M Hill. 2015a. Basis of Design Report/Final (100%) Design Submittal for the Final Groundwater Remedy, PG&E Topock Compressor Station, Needles, California. November.
- CH2M Hill. 2015b. Construction/Remedial Action Work Plan for the Final Groundwater Remedy. PG&E Topock Compressor Station, Needles, California. November.
- Critigen. 2020. Addendum to the PG&E Program Quality Assurance Project Plan for Groundwater and Surface Water Sampling at the Topock Chromium Site. April.
- DOI. 2010. Groundwater Record of Decision, Pacific Gas and Electric Company, Topock Compressor Station, Needles, San Bernardino County, California. ROD cover date is December 2010; signed/approved by DOI on January 20, 2011.
- DTSC and DOI. 2011. Memorandum of Understanding (MOU) concerning the coordination in overseeing the implementation of groundwater response action at Topock Compressor Station. November 22.

# **Tables**

**Table 3.1****Summary of NTH IRZ Well Operations****Second Quarter 2022 Well Performance Report**

Pacific Gas and Electric Company, Topock Compressor Station, Needles, California

Well ID	Aquifer Interval	Well Type	Operating Period	Recirculated Groundwater Volume (gal)	Total Hours Operating (hours)	Active Time Operating (percent)	Average Flow Rate When Operating (gpm)
IRZ-15	Upper	Injection	Nov-21	--	--	--	--
IRZ-15	Upper	Injection	Dec-21	--	--	--	--
IRZ-15	Upper	Injection	Jan-22	--	--	--	--
IRZ-15	Upper	Injection	Feb-22	--	--	--	--
IRZ-15	Upper	Injection	Mar-22	--	--	--	--
IRZ-15	Upper	Injection	Apr-22	--	--	--	--
IRZ-15	Upper	Injection	May-22	--	--	--	--
IRZ-15	Upper	Injection	Jun-22	--	--	--	--
IRZ-15	Lower	Injection	Nov-21	--	--	--	--
IRZ-15	Lower	Injection	Dec-21	--	--	--	--
IRZ-15	Lower	Injection	Jan-22	--	--	--	--
IRZ-15	Lower	Injection	Feb-22	--	--	--	--
IRZ-15	Lower	Injection	Mar-22	--	--	--	--
IRZ-15	Lower	Injection	Apr-22	--	--	--	--
IRZ-15	Lower	Injection	May-22	--	--	--	--
IRZ-15	Lower	Injection	Jun-22	--	--	--	--
IRZ-16	Upper	Injection	Nov-21	--	--	--	--
IRZ-16	Upper	Injection	Dec-21	18,090	55	7	5.5
IRZ-16	Upper	Injection	Jan-22	47,945	150	20	5.3
IRZ-16	Upper	Injection	Feb-22	3,011	10	1	5.0
IRZ-16	Upper	Injection	Mar-22	188,133	610	82	5.1
IRZ-16	Upper	Injection	Apr-22	201,577	521	72	6.4
IRZ-16	Upper	Injection	May-22	159,085	495	67	5.4
IRZ-16	Upper	Injection	Jun-22	204,790	634	88	5.4
IRZ-16	Lower	Injection	Nov-21	--	--	--	--
IRZ-16	Lower	Injection	Dec-21	37,913	56	8	11
IRZ-16	Lower	Injection	Jan-22	83,007	139	19	10
IRZ-16	Lower	Injection	Feb-22	5,621	10	1	9.4
IRZ-16	Lower	Injection	Mar-22	368,922	608	82	10
IRZ-16	Lower	Injection	Apr-22	344,997	521	72	11
IRZ-16	Lower	Injection	May-22	308,301	494	66	10
IRZ-16	Lower	Injection	Jun-22	415,866	633	88	11
IRZ-17	Upper	Injection	Nov-21	--	--	--	--
IRZ-17	Upper	Injection	Dec-21	25,091	56	8	7.5
IRZ-17	Upper	Injection	Jan-22	61,929	153	21	6.7
IRZ-17	Upper	Injection	Feb-22	3,761	10	1	6.3
IRZ-17	Upper	Injection	Mar-22	253,824	636	85	6.7
IRZ-17	Upper	Injection	Apr-22	260,224	560	78	7.7
IRZ-17	Upper	Injection	May-22	206,311	484	65	7.1
IRZ-17	Upper	Injection	Jun-22	246,831	634	88	6.5
IRZ-17	Lower	Injection	Nov-21	--	--	--	--
IRZ-17	Lower	Injection	Dec-21	48,210	56	8	14

**Table 3.1****Summary of NTH IRZ Well Operations****Second Quarter 2022 Well Performance Report**

Pacific Gas and Electric Company, Topock Compressor Station, Needles, California

Well ID	Aquifer Interval	Well Type	Operating Period	Recirculated Groundwater Volume (gal)	Total Hours Operating (hours)	Active Time Operating (percent)	Average Flow Rate When Operating (gpm)
IRZ-17	Lower	Injection	Jan-22	126,137	153	21	14
IRZ-17	Lower	Injection	Feb-22	7,626	10	1	13
IRZ-17	Lower	Injection	Mar-22	511,032	632	85	14
IRZ-17	Lower	Injection	Apr-22	450,449	558	78	14
IRZ-17	Lower	Injection	May-22	361,052	480	65	13
IRZ-17	Lower	Injection	Jun-22	521,889	635	88	14
IRZ-18	Upper	Injection	Nov-21	--	--	--	--
IRZ-18	Upper	Injection	Dec-21	23,330	56	8	6.9
IRZ-18	Upper	Injection	Jan-22	57,708	150	20	6.4
IRZ-18	Upper	Injection	Feb-22	3,581	10	1	6.0
IRZ-18	Upper	Injection	Mar-22	237,093	598	80	6.6
IRZ-18	Upper	Injection	Apr-22	134,493	221	31	10
IRZ-18	Upper	Injection	May-22	204,232	497	67	6.8
IRZ-18	Upper	Injection	Jun-22	222,597	635	88	5.8
IRZ-18	Lower	Injection	Nov-21	--	--	--	--
IRZ-18	Lower	Injection	Dec-21	46,126	56	8	14
IRZ-18	Lower	Injection	Jan-22	124,878	152	20	14
IRZ-18	Lower	Injection	Feb-22	7,496	10	1	13
IRZ-18	Lower	Injection	Mar-22	441,208	598	80	12
IRZ-18	Lower	Injection	Apr-22	133,829	221	31	10
IRZ-18	Lower	Injection	May-22	355,640	497	67	12
IRZ-18	Lower	Injection	Jun-22	500,638	636	88	13
IRZ-20	Upper	Injection	Nov-21	--	--	--	--
IRZ-20	Upper	Injection	Dec-21	18,890	56	8	5.6
IRZ-20	Upper	Injection	Jan-22	48,376	151	20	5.3
IRZ-20	Upper	Injection	Feb-22	2,701	9	1	5.0
IRZ-20	Upper	Injection	Mar-22	202,257	630	85	5.4
IRZ-20	Upper	Injection	Apr-22	253,197	560	78	7.5
IRZ-20	Upper	Injection	May-22	132,019	472	63	4.7
IRZ-20	Upper	Injection	Jun-22	197,493	632	88	5.2
IRZ-20	Lower	Injection	Nov-21	--	--	--	--
IRZ-20	Lower	Injection	Dec-21	34,313	55	7	10
IRZ-20	Lower	Injection	Jan-22	93,639	152	20	10
IRZ-20	Lower	Injection	Feb-22	5,767	10	1	9.6
IRZ-20	Lower	Injection	Mar-22	388,733	631	85	10
IRZ-20	Lower	Injection	Apr-22	384,225	559	78	12
IRZ-20	Lower	Injection	May-22	288,041	477	64	10
IRZ-20	Lower	Injection	Jun-22	384,856	633	88	10
IRZ-21	Upper	Injection	Nov-21	--	--	--	--
IRZ-21	Upper	Injection	Dec-21	--	--	--	--
IRZ-21	Upper	Injection	Jan-22	--	--	--	--
IRZ-21	Upper	Injection	Feb-22	--	--	--	--

**Table 3.1****Summary of NTH IRZ Well Operations****Second Quarter 2022 Well Performance Report**

Pacific Gas and Electric Company, Topock Compressor Station, Needles, California

Well ID	Aquifer Interval	Well Type	Operating Period	Recirculated Groundwater Volume (gal)	Total Hours Operating (hours)	Active Time Operating (percent)	Average Flow Rate When Operating (gpm)
IRZ-21	Upper	Injection	Mar-22	--	--	--	--
IRZ-21	Upper	Injection	Apr-22	--	--	--	--
IRZ-21	Upper	Injection	May-22	--	--	--	--
IRZ-21	Upper	Injection	Jun-22	--	--	--	--
IRZ-21	Lower	Injection	Nov-21	--	--	--	--
IRZ-21	Lower	Injection	Dec-21	--	--	--	--
IRZ-21	Lower	Injection	Jan-22	--	--	--	--
IRZ-21	Lower	Injection	Feb-22	--	--	--	--
IRZ-21	Lower	Injection	Mar-22	--	--	--	--
IRZ-21	Lower	Injection	Apr-22	--	--	--	--
IRZ-21	Lower	Injection	May-22	--	--	--	--
IRZ-21	Lower	Injection	Jun-22	--	--	--	--
IRZ-25	Upper / Upper Middle	Injection	Nov-21	--	--	--	--
IRZ-25	Upper / Upper Middle	Injection	Dec-21	--	--	--	--
IRZ-25	Upper / Upper Middle	Injection	Jan-22	--	--	--	--
IRZ-25	Upper / Upper Middle	Injection	Feb-22	--	--	--	--
IRZ-25	Upper / Upper Middle	Injection	Mar-22	--	--	--	--
IRZ-25	Upper / Upper Middle	Injection	Apr-22	--	--	--	--
IRZ-25	Upper / Upper Middle	Injection	May-22	--	--	--	--
IRZ-25	Upper / Upper Middle	Injection	Jun-22	--	--	--	--
IRZ-25	Lower	Injection	Nov-21	--	--	--	--
IRZ-25	Lower	Injection	Dec-21	--	--	--	--
IRZ-25	Lower	Injection	Jan-22	--	--	--	--
IRZ-25	Lower	Injection	Feb-22	--	--	--	--
IRZ-25	Lower	Injection	Mar-22	--	--	--	--
IRZ-25	Lower	Injection	Apr-22	--	--	--	--
IRZ-25	Lower	Injection	May-22	--	--	--	--
IRZ-25	Lower	Injection	Jun-22	--	--	--	--
IRZ-27	Upper / Upper Middle	Injection	Nov-21	--	--	--	--
IRZ-27	Upper / Upper Middle	Injection	Dec-21	36,743	56	8	11
IRZ-27	Upper / Upper Middle	Injection	Jan-22	103,663	154	21	12
IRZ-27	Upper / Upper Middle	Injection	Feb-22	113,867	169	23	11
IRZ-27	Upper / Upper Middle	Injection	Mar-22	395,578	594	80	11
IRZ-27	Upper / Upper Middle	Injection	Apr-22	160,844	232	32	12
IRZ-27	Upper / Upper Middle	Injection	May-22	336,518	495	67	11
IRZ-27	Upper / Upper Middle	Injection	Jun-22	425,095	633	88	11
IRZ-27	Lower	Injection	Nov-21	--	--	--	--
IRZ-27	Lower	Injection	Dec-21	23,710	56	8	7.1
IRZ-27	Lower	Injection	Jan-22	47,797	154	21	5.4
IRZ-27	Lower	Injection	Feb-22	53,661	167	22	5.4
IRZ-27	Lower	Injection	Mar-22	190,998	594	80	5.4
IRZ-27	Lower	Injection	Apr-22	82,801	232	32	6.0

**Table 3.1****Summary of NTH IRZ Well Operations****Second Quarter 2022 Well Performance Report**

Pacific Gas and Electric Company, Topock Compressor Station, Needles, California

Well ID	Aquifer Interval	Well Type	Operating Period	Recirculated Groundwater Volume (gal)	Total Hours Operating (hours)	Active Time Operating (percent)	Average Flow Rate When Operating (gpm)
IRZ-27	Lower	Injection	May-22	152,496	495	67	5.1
IRZ-27	Lower	Injection	Jun-22	238,803	633	88	6.3
IRZ-29	Upper	Injection	Nov-21	--	--	--	--
IRZ-29	Upper	Injection	Dec-21	--	--	--	--
IRZ-29	Upper	Injection	Jan-22	740	3	0	4.1
IRZ-29	Upper	Injection	Feb-22	50,817	157	21	5.4
IRZ-29	Upper	Injection	Mar-22	121,397	388	52	5.2
IRZ-29	Upper	Injection	Apr-22	71,497	241	33	5.0
IRZ-29	Upper	Injection	May-22	155,773	475	64	5.5
IRZ-29	Upper	Injection	Jun-22	236,587	632	88	6.2
IRZ-29	Lower	Injection	Nov-21	--	--	--	--
IRZ-29	Lower	Injection	Dec-21	--	--	--	--
IRZ-29	Lower	Injection	Jan-22	3,450	5	1	12
IRZ-29	Lower	Injection	Feb-22	70,677	158	21	7.5
IRZ-29	Lower	Injection	Mar-22	167,369	389	52	7.2
IRZ-29	Lower	Injection	Apr-22	92,461	243	34	6.3
IRZ-29	Lower	Injection	May-22	200,840	497	67	6.7
IRZ-29	Lower	Injection	Jun-22	306,910	637	88	8.0
IRZ-31	Upper	Injection	Nov-21	--	--	--	--
IRZ-31	Upper	Injection	Dec-21	--	--	--	--
IRZ-31	Upper	Injection	Jan-22	2,620	4	1	11
IRZ-31	Upper	Injection	Feb-22	60,855	160	22	6.3
IRZ-31	Upper	Injection	Mar-22	141,661	389	52	6.1
IRZ-31	Upper	Injection	Apr-22	91,150	247	34	6.2
IRZ-31	Upper	Injection	May-22	180,400	476	64	6.3
IRZ-31	Upper	Injection	Jun-22	286,700	633	88	7.5
IRZ-31	Lower	Injection	Nov-21	--	--	--	--
IRZ-31	Lower	Injection	Dec-21	--	--	--	--
IRZ-31	Lower	Injection	Jan-22	3,380	5	1	11
IRZ-31	Lower	Injection	Feb-22	60,795	161	22	6.3
IRZ-31	Lower	Injection	Mar-22	144,199	389	52	6.2
IRZ-31	Lower	Injection	Apr-22	90,213	247	34	6.1
IRZ-31	Lower	Injection	May-22	172,157	474	64	6.1
IRZ-31	Lower	Injection	Jun-22	283,737	632	88	7.5
IRZ-33	Upper	Injection	Nov-21	--	--	--	--
IRZ-33	Upper	Injection	Dec-21	--	--	--	--
IRZ-33	Upper	Injection	Jan-22	560	2	0	4.7
IRZ-33	Upper	Injection	Feb-22	42,259	158	21	4.5
IRZ-33	Upper	Injection	Mar-22	97,704	389	52	4.2
IRZ-33	Upper	Injection	Apr-22	--	--	--	--

**Table 3.1****Summary of NTH IRZ Well Operations****Second Quarter 2022 Well Performance Report**

Pacific Gas and Electric Company, Topock Compressor Station, Needles, California

Well ID	Aquifer Interval	Well Type	Operating Period	Recirculated Groundwater Volume (gal)	Total Hours Operating (hours)	Active Time Operating (percent)	Average Flow Rate When Operating (gpm)
IRZ-33	Upper	Injection	May-22	92,191	160	22	9.6
IRZ-33	Upper	Injection	Jun-22	199,182	634	88	5.2
IRZ-33	Lower	Injection	Nov-21	--	--	--	--
IRZ-33	Lower	Injection	Dec-21	--	--	--	--
IRZ-33	Lower	Injection	Jan-22	480	2	0.3	4.0
IRZ-33	Lower	Injection	Feb-22	41,839	158	21	4.4
IRZ-33	Lower	Injection	Mar-22	97,074	389	52	4.2
IRZ-33	Lower	Injection	Apr-22	--	--	--	--
IRZ-33	Lower	Injection	May-22	119,857	395	53	5.1
IRZ-33	Lower	Injection	Jun-22	198,892	633	88	5.2
IRZ-35	Upper	Injection	Nov-21	--	--	--	--
IRZ-35	Upper	Injection	Dec-21	--	--	--	--
IRZ-35	Upper	Injection	Jan-22	800	2	0	
IRZ-35	Upper	Injection	Feb-22	51,887	158	21	5.5
IRZ-35	Upper	Injection	Mar-22	118,638	387	52	5.1
IRZ-35	Upper	Injection	Apr-22	76,787	190	26	6.7
IRZ-35	Upper	Injection	May-22	156,513	327	44	8.0
IRZ-35	Upper	Injection	Jun-22	170,729	427	59	6.7
IRZ-37	Upper	Injection	Nov-21	--	--	--	--
IRZ-37	Upper	Injection	Dec-21	--	--	--	--
IRZ-37	Upper	Injection	Jan-22	380	2	0	3.2
IRZ-37	Upper	Injection	Feb-22	31,301	153	21	3.4
IRZ-37	Upper	Injection	Mar-22	76,904	383	51	3.3
IRZ-37	Upper	Injection	Apr-22	60	0.3	0.04	3.3
IRZ-37	Upper	Injection	May-22	88,691	405	54	3.6
IRZ-37	Upper	Injection	Jun-22	100,323	425	59	3.9
IRZ-39	Upper	Injection	Nov-21	--	--	--	--
IRZ-39	Upper	Injection	Dec-21	--	--	--	--
IRZ-39	Upper	Injection	Jan-22	--	--	--	--
IRZ-39	Upper	Injection	Feb-22	17,140	72	10	4.0
IRZ-39	Upper	Injection	Mar-22	83,493	384	52	3.6
IRZ-39	Upper	Injection	Apr-22	5,811	37	5	2.6
IRZ-39	Upper	Injection	May-22	--	--	--	--
IRZ-39	Upper	Injection	Jun-22	--	--	--	--

**Table 3.1****Summary of NTH IRZ Well Operations****Second Quarter 2022 Well Performance Report**

Pacific Gas and Electric Company, Topock Compressor Station, Needles, California

Well ID	Aquifer Interval	Well Type	Operating Period	Recirculated Groundwater Volume (gal)	Total Hours Operating (hours)	Active Time Operating (percent)	Average Flow Rate When Operating (gpm)
IRZ-9	Upper	Extraction	Nov-21	--	--	--	--
IRZ-9	Upper	Extraction	Dec-21	--	--	--	--
IRZ-9	Upper	Extraction	Jan-22	207,010	66	9	52
IRZ-9	Upper	Extraction	Feb-22	--	--	--	--
IRZ-9	Upper	Extraction	Mar-22	612	1	0.1	10
IRZ-9	Upper	Extraction	Apr-22	420	0.0	0.0	42
IRZ-9	Upper	Extraction	May-22	1,189	0.3	0.0	66
IRZ-9	Upper	Extraction	Jun-22	2,649	1	0.1	44
IRZ-13D	Lower	Extraction	Nov-21	--	--	--	--
IRZ-13D	Lower	Extraction	Dec-21	--	--	--	--
IRZ-13D	Lower	Extraction	Jan-22	--	--	--	--
IRZ-13D	Lower	Extraction	Feb-22	--	--	--	--
IRZ-13D	Lower	Extraction	Mar-22	937,033	391	53	40
IRZ-13D	Lower	Extraction	Apr-22	353,835	220	31	27
IRZ-13D	Lower	Extraction	May-22	728,432	472	63	26
IRZ-13D	Lower	Extraction	Jun-22	1,071,385	630	88	28
IRZ-13S	Upper	Extraction	Nov-21	--	--	--	--
IRZ-13S	Upper	Extraction	Dec-21	--	--	--	--
IRZ-13S	Upper	Extraction	Jan-22	--	--	--	--
IRZ-13S	Upper	Extraction	Feb-22	--	--	--	--
IRZ-13S	Upper	Extraction	Mar-22	674,317	391	53	29
IRZ-13S	Upper	Extraction	Apr-22	491,289	241	33	34
IRZ-13S	Upper	Extraction	May-22	1,115,829	470	63	40
IRZ-13S	Upper	Extraction	Jun-22	1,594,436	629	87	42
IRZ-23	Lower	Extraction	Nov-21	--	--	--	--
IRZ-23	Lower	Extraction	Dec-21	307,610	56	8	92
IRZ-23	Lower	Extraction	Jan-22	583,763	148	20	66
IRZ-23	Lower	Extraction	Feb-22	615,500	168	23	61
IRZ-23	Lower	Extraction	Mar-22	2,542,801	621	83	68
IRZ-23	Lower	Extraction	Apr-22	1,887,412	543	75	58
IRZ-23	Lower	Extraction	May-22	1,682,733	476	64	59
IRZ-23	Lower	Extraction	Jun-22	2,317,090	634	88	61

**Abbreviations:**

-- = not applicable

gal = gallon

gpm = gallons per minute

ID = identification

IRZ = In Situ Reactive Zone

NTH = National Trails Highway

**Table 3.2****NTH IRZ System Operations and Non-Routine Maintenance Log****Second Quarter 2022 Well Performance Report****Pacific Gas and Electric Company, Topock Compressor Station, Needles, California**

Date	Approximate IRZ Systemwide Down Time (days)	Operations and Maintenance Log	Notes
4/1/2022	--	Backwashed operating injection wells IRZ-16, IRZ-17, and IRZ-20.	--
4/5/2022	--	Injection well IRZ-39 resumed operation.	--
4/6/2022	--	Approximately 2,000 gallons of stormwater from secondary containment added to backwash tank.	--
4/6/2022	--	Ethanol dosing of IRZ-16, IRZ-17, IRZ-20, IRZ-39 occurred.	--
4/6/2022 through 4/7/2022	--	Functional testing of RPWC system occurred. Clean water was transferred between conditioned water storage tank to clean-in-place tank. Water was not reinjected.	--
4/7/2022	--	Injection well IRZ-39 offline.	Control panel parts from this well were moved to allow operation of other IRZ wells.
4/8/2022	0.3	IRZ system offline. IRZ-23 shut down, causing wells IRZ-16, IRZ-17, and IRZ-20 to shut down. Alarm reset and wells resumed operation.	Communications alarm.
4/8/2022	--	Backwashed operating injection wells. IRZ-16, IRZ-17, IRZ-20.	--
4/11/2022	--	Processed backwash water to conditioning tank and collected backwash sample from processed backwash water.	--
4/12/2022	--	Samples collected from IRZ-15, IRZ-21, IRZ-25, IRZ-9, IRZ-13S, IRZ-13D, and IRZ-23.	--
4/13/2022	--	Ethanol dosing of IRZ-16, IRZ-17, and IRZ-20 occurred. Collected ethanol and TOC samples from carbon amendment system.	--
4/14/2022	--	IRZ-27, IRZ-29, IRZ-31, and IRZ-13S resumed operation. Wells operating: Extraction wells: IRZ-13S, IRZ-23 Injection wells: IRZ-16, IRZ-17, IRZ-18, IRZ-20, IRZ-27, IRZ-29, IRZ-31.	Equipment components inspected and tested to verify functionality prior to operation.
4/14/2022 through 4/15/2022	--	Reinjected conditioned water.	--
4/15/2022	--	Backwash injection wells IRZ-16, IRZ-17, and IRZ-20.	Remaining operating wells not backwashed due to limited operational time to date.
4/15/2022	--	Extraction well IRZ-13D resumed operation.	--
4/16/2022	--	Injection well IRZ-35 resumed operation.	--
4/18/2022 through 4/19/2022	--	Reinjected conditioned water.	--
4/20/2022	--	Ethanol dosing occurred.	--
4/22/2022	--	Backwashed injection wells IRZ-16, IRZ-17, IRZ-20, IRZ-27 , IRZ-29, IRZ-31.	IRZ-18 and IRZ-35 not backwashed.
4/24/2022 through 5/6/2022	11.9	IRZ system offline.	TCS shut down system during load shedding.

**Table 3.2****NTH IRZ System Operations and Non-Routine Maintenance Log****Second Quarter 2022 Well Performance Report****Pacific Gas and Electric Company, Topock Compressor Station, Needles, California**

Date	Approximate IRZ Systemwide Down Time (days)	Operations and Maintenance Log	Notes
5/7/2022 through 5/8/2022	--	SCADA offline over the weekend, resulting in data loss. Wells continued to operate based on staff observation on 5/7/2022 and SCADA totalizer data recorded on 5/9/2022.	SCADA software was corrupted during prior system shutdown and needed to be reinstalled.
5/9/2022	--	Resolved SCADA issues and completed troubleshooting of IRZ-33 (lower) backwash pump and IRZ-37 flowmeter. Wells operating: Extraction: IRZ-13S, IRZ-13D, IRZ-23 Injection: IRZ-16, IRZ-17, IRZ-18, IRZ-20, IRZ-27, IRZ-29, IRZ-31, IRZ-33 (lower), IRZ-35, IRZ-37.	Software reinstallation successful.
5/9/2022	--	Ethanol dosing occurred. Collected ethanol and TOC samples from carbon amendment system.	--
5/10/2022 through 5/11/2022	--	SCADA offline while troubleshooting software bugs, resulting in data loss. Wells continued to operate based on staff observation and SCADA totalizer data recorded on 5/11/2022.	Software bugs occurred following software reinstallation.
5/12/2022	--	A work truck fuel tank was punctured on the corner of one of the electrical vaults located near MW-22. Approximately 1 gallon of diesel spilled into vault.	System was shut down on 5/18/2022 in order to pump the fuel and water out of the vault.
5/13/2022	--	Backwashed injection wells IRZ-16, IRZ-17, IRZ-18, IRZ-20, IRZ-27 (upper/middle), IRZ-29 (upper), and IRZ-31.	--
5/13/2022 through 5/16/2022	2.8	IRZ system offline.	TCS power loss.
5/17/2022	--	Sampled IRZ-23, IRZ-13S, and IRZ-13D.	--
5/17/2022	--	Ethanol dosing occurred.	--
5/18/2022	--	Sampled IRZ-9.	--
5/18/2022	0.2	IRZ system offline.	Removed approximately 1 gallon of diesel and water from electrical vault near MW-22.
5/19/2022 through 5/20/2022	1.3	IRZ system offline.	TCS power loss.
5/20/2022	--	IRZ system online. Backwashed injection wells IRZ-16, IRZ-17, IRZ-18, IRZ-20, IRZ-27, IRZ-29, IRZ-31, IRZ-33 (lower), IRZ-35, and IRZ-37.	--
5/23/2022	--	Processed backwash water to conditioned water storage tank and collected backwash samples	--
5/23/2022	0.1	IRZ system offline.	Instrumentation and controls server reboot.
5/24/2022	0.1	IRZ system offline.	E-stops rewired.
5/24/2022	--	Injection well IRZ-33 (upper) resumed operation.	Backwash pump operational. New motor starter arrived.

**Table 3.2****NTH IRZ System Operations and Non-Routine Maintenance Log****Second Quarter 2022 Well Performance Report****Pacific Gas and Electric Company, Topock Compressor Station, Needles, California**

Date	Approximate IRZ Systemwide Down Time (days)	Operations and Maintenance Log	Notes
5/24/2022	--	Ethanol dosing occurred. Collected ethanol and TOC samples from carbon amendment system.	--
5/25/2022	0.1	IRZ system offline.	Troubleshooting E-stops and repairing flood damage to IRZ-33.
5/25/2022 through 5/26/2022	--	Installed motor starter in IRZ-33 (upper). IRZ-33 resumed operation on 5/26/2022.	--
5/26/2022	--	Reinjected conditioned water.	--
5/27/2022	--	Backwashed injection wells IRZ-16, IRZ-17, IRZ-18, IRZ-20, IRZ-27, IRZ-29, IRZ-31, IRZ-33, IRZ-35, and IRZ-37.	--
5/31/2022	--	Ethanol Dosing occurred.	--
6/1/2022 through 6/3/2022	--	Processed backwash water to conditioned water storage tank and reinjected conditioned water.	--
6/3/2022	--	Backwashed injection wells IRZ-16, IRZ-17, IRZ-18, IRZ-20, IRZ-27, IRZ-29, IRZ-31, IRZ-33, and IRZ-37.	IRZ-35 backwash pump was not operating.
6/6/2022	--	Injection wells IRZ-35 and IRZ-37 offline to replace programmable logic controller and to continue troubleshooting IRZ-35 backwash pump.	--
6/7/2022	--	Ethanol dosing occurred. Collected ethanol and TOC samples from carbon amendment system.	--
6/9/2022	0.1	IRZ system offline.	TCS power outage.
6/10/2022	--	Backwashed injection wells IRZ-16, IRZ-17, IRZ-18, IRZ-20, IRZ-27, IRZ-29, IRZ-31, and IRZ-33.	--
6/13/2022	--	Samples collected from IRZ-9, IRZ-13S, IRZ-13D, and IRZ-23.	--
6/14/2022	--	Ethanol dosing occurred.	--
6/15/2022	--	Injection wells IRZ-35 and IRZ-37 resumed operation. Extraction flowrates increased to accommodate additional wells. Injection well flowrates for southern forcemain wells (IRZ-27, IRZ-29, IRZ-31, IRZ-33, IRZ-35, IRZ-37) increased by 50% to increase treatment.	Programmable logic controller issues resolved, allowing IRZ-35 and IRZ-37 to resume operation.
6/15/2022	0.04	IRZ system offline.	Water being sprayed by water truck filled sump in IRZ-35/37, triggering a high water alarm.
6/15/2022 through 6/16/2022	--	Processed backwash water into conditioned water storage tank. Reinjected conditioned water into injection wells.	--
6/17/2022	--	Backwashed injection wells IRZ-16, IRZ-17, IRZ-18, IRZ-20, IRZ-27, IRZ-29, IRZ-31, and IRZ-33.	--
6/21/2022	--	Ethanol dosing occurred. Collected ethanol and TOC samples from carbon amendment system.	--
6/23/2022	--	Processed backwash water into conditioned water storage tank.	--

**Table 3.2****NTH IRZ System Operations and Non-Routine Maintenance Log****Second Quarter 2022 Well Performance Report****Pacific Gas and Electric Company, Topock Compressor Station, Needles, California**

Date	Approximate IRZ Systemwide Down Time (days)	Operations and Maintenance Log	Notes
6/24/2022	0.1	IRZ system offline.	TCS power load shedding.
6/24/2022	--	Backwashed injection wells IRZ-16, IRZ-17, IRZ-18, IRZ-20, IRZ-27, IRZ-29, IRZ-31, IRZ-33, IRZ-35, and IRZ-37.	--
6/27/2022 through 6/30/2022	3.0	IRZ system offline.	Planned outage to conduct transformer repairs.
6/30/2022	--	System re-energized. Wells operating: Extraction wells: IRZ-13S, IRZ-13D, IRZ-23. Injection wells: IRZ-16, IRZ-17, IRZ-18, IRZ-20, IRZ-27, IRZ-29, IRZ-31, IRZ-33, IRZ-35, IRZ-37, IRZ-39.	--

**Abbreviations:**

-- = not applicable

IRZ = in-situ reactive zone

NTH = National Trails Highway

SCADA = supervisory control and data acquisition

TOC = total organic carbon

TCS = Topock Compressor Station

**Table 3.3**

**Summary of NTH IRZ Well Specific Capacities**  
**Second Quarter 2022 Well Performance Report**  
**Pacific Gas and Electric Company, Topock Compressor Station, Needles, California**

Well ID	Aquifer Interval	Well Type	Operating Period	Monthly Average Specific Capacity (gpm/ft)	Baseline Specific Capacity
IRZ-15	Upper	Injection	Nov-21	--	--
IRZ-15	Upper	Injection	Dec-21	--	--
IRZ-15	Upper	Injection	Jan-22	--	--
IRZ-15	Upper	Injection	Feb-22	--	--
IRZ-15	Upper	Injection	Mar-22	--	--
IRZ-15	Upper	Injection	Apr-22	--	--
IRZ-15	Upper	Injection	May-22	--	--
IRZ-15	Upper	Injection	Jun-22	--	--
IRZ-15	Lower	Injection	Nov-21	--	--
IRZ-15	Lower	Injection	Dec-21	--	--
IRZ-15	Lower	Injection	Jan-22	--	--
IRZ-15	Lower	Injection	Feb-22	--	--
IRZ-15	Lower	Injection	Mar-22	--	--
IRZ-15	Lower	Injection	Apr-22	--	--
IRZ-15	Lower	Injection	May-22	--	--
IRZ-15	Lower	Injection	Jun-22	--	--
IRZ-16	Upper	Injection	Nov-21	--	--
IRZ-16	Upper	Injection	Dec-21	1.0	--
IRZ-16	Upper	Injection	Jan-22	0.95	--
IRZ-16	Upper	Injection	Feb-22	0.78	--
IRZ-16	Upper	Injection	Mar-22	0.64	--
IRZ-16	Upper	Injection	Apr-22	0.62	--
IRZ-16	Upper	Injection	May-22	0.53	--
IRZ-16	Upper	Injection	Jun-22	0.60	0.60
IRZ-16	Lower	Injection	Nov-21	--	--
IRZ-16	Lower	Injection	Dec-21	1.1	--
IRZ-16	Lower	Injection	Jan-22	1.1	--
IRZ-16	Lower	Injection	Feb-22	0.78	--
IRZ-16	Lower	Injection	Mar-22	0.72	--
IRZ-16	Lower	Injection	Apr-22	0.69	--
IRZ-16	Lower	Injection	May-22	0.69	--
IRZ-16	Lower	Injection	Jun-22	0.78	0.78
IRZ-17	Upper	Injection	Nov-21	--	--
IRZ-17	Upper	Injection	Dec-21	3.7	--
IRZ-17	Upper	Injection	Jan-22	3.5	--
IRZ-17	Upper	Injection	Feb-22	2.3	--
IRZ-17	Upper	Injection	Mar-22	1.8	--
IRZ-17	Upper	Injection	Apr-22	0.97	--
IRZ-17	Upper	Injection	May-22	0.71	--
IRZ-17	Upper	Injection	Jun-22	0.76	0.76
IRZ-17	Lower	Injection	Nov-21	--	--
IRZ-17	Lower	Injection	Dec-21	1.5	--
IRZ-17	Lower	Injection	Jan-22	1.3	--
IRZ-17	Lower	Injection	Feb-22	1.0	--
IRZ-17	Lower	Injection	Mar-22	0.86	--

**Table 3.3****Summary of NTH IRZ Well Specific Capacities****Second Quarter 2022 Well Performance Report****Pacific Gas and Electric Company, Topock Compressor Station, Needles, California**

Well ID	Aquifer Interval	Well Type	Operating Period	Monthly Average Specific Capacity (gpm/ft)	Baseline Specific Capacity
IRZ-17	Lower	Injection	Apr-22	0.70	--
IRZ-17	Lower	Injection	May-22	0.66	--
IRZ-17	Lower	Injection	Jun-22	0.71	0.71
IRZ-18	Upper	Injection	Nov-21	--	--
IRZ-18	Upper	Injection	Dec-21	1.5	--
IRZ-18	Upper	Injection	Jan-22	1.3	--
IRZ-18	Upper	Injection	Feb-22	1.1	--
IRZ-18	Upper	Injection	Mar-22	0.85	--
IRZ-18	Upper	Injection	Apr-22	0.97	--
IRZ-18	Upper	Injection	May-22	0.71	--
IRZ-18	Upper	Injection	Jun-22	0.61	0.61
IRZ-18	Lower	Injection	Nov-21	--	--
IRZ-18	Lower	Injection	Dec-21	1.1	--
IRZ-18	Lower	Injection	Jan-22	0.96	--
IRZ-18	Lower	Injection	Feb-22	0.78	--
IRZ-18	Lower	Injection	Mar-22	0.67	--
IRZ-18	Lower	Injection	Apr-22	0.57	--
IRZ-18	Lower	Injection	May-22	0.66	--
IRZ-18	Lower	Injection	Jun-22	0.73	0.73
IRZ-20	Upper	Injection	Nov-21	--	--
IRZ-20	Upper	Injection	Dec-21	1.1	--
IRZ-20	Upper	Injection	Jan-22	1.1	--
IRZ-20	Upper	Injection	Feb-22	0.79	--
IRZ-20	Upper	Injection	Mar-22	0.72	--
IRZ-20	Upper	Injection	Apr-22	0.78	--
IRZ-20	Upper	Injection	May-22	0.49	--
IRZ-20	Upper	Injection	Jun-22	0.59	0.59
IRZ-20	Lower	Injection	Nov-21	--	--
IRZ-20	Lower	Injection	Dec-21	0.83	--
IRZ-20	Lower	Injection	Jan-22	0.76	--
IRZ-20	Lower	Injection	Feb-22	0.68	--
IRZ-20	Lower	Injection	Mar-22	0.62	--
IRZ-20	Lower	Injection	Apr-22	0.60	--
IRZ-20	Lower	Injection	May-22	0.55	--
IRZ-20	Lower	Injection	Jun-22	0.54	0.54
IRZ-21	Upper	Injection	Nov-21	--	--
IRZ-21	Upper	Injection	Dec-21	--	--
IRZ-21	Upper	Injection	Jan-22	--	--
IRZ-21	Upper	Injection	Feb-22	--	--
IRZ-21	Upper	Injection	Mar-22	--	--
IRZ-21	Upper	Injection	Apr-22	--	--
IRZ-21	Upper	Injection	May-22	--	--
IRZ-21	Upper	Injection	Jun-22	--	--
IRZ-21	Lower	Injection	Nov-21	--	--
IRZ-21	Lower	Injection	Dec-21	--	--

**Table 3.3**

**Summary of NTH IRZ Well Specific Capacities**  
**Second Quarter 2022 Well Performance Report**  
**Pacific Gas and Electric Company, Topock Compressor Station, Needles, California**

Well ID	Aquifer Interval	Well Type	Operating Period	Monthly Average Specific Capacity (gpm/ft)	Baseline Specific Capacity
IRZ-21	Lower	Injection	Jan-22	--	--
IRZ-21	Lower	Injection	Feb-22	--	--
IRZ-21	Lower	Injection	Mar-22	--	--
IRZ-21	Lower	Injection	Apr-22	--	--
IRZ-21	Lower	Injection	May-22	--	--
IRZ-21	Lower	Injection	Jun-22	--	--
IRZ-25	Upper / Upper Middle	Injection	Nov-21	--	--
IRZ-25	Upper / Upper Middle	Injection	Dec-21	--	--
IRZ-25	Upper / Upper Middle	Injection	Jan-22	--	--
IRZ-25	Upper / Upper Middle	Injection	Feb-22	--	--
IRZ-25	Upper / Upper Middle	Injection	Mar-22	--	--
IRZ-25	Upper / Upper Middle	Injection	Apr-22	--	--
IRZ-25	Upper / Upper Middle	Injection	May-22	--	--
IRZ-25	Upper / Upper Middle	Injection	Jun-22	--	--
IRZ-25	Lower	Injection	Nov-21	--	--
IRZ-25	Lower	Injection	Dec-21	--	--
IRZ-25	Lower	Injection	Jan-22	--	--
IRZ-25	Lower	Injection	Feb-22	--	--
IRZ-25	Lower	Injection	Mar-22	--	--
IRZ-25	Lower	Injection	Apr-22	--	--
IRZ-25	Lower	Injection	May-22	--	--
IRZ-25	Lower	Injection	Jun-22	--	--
IRZ-27	Upper / Upper Middle	Injection	Nov-21	--	--
IRZ-27	Upper / Upper Middle	Injection	Dec-21	0.93	--
IRZ-27	Upper / Upper Middle	Injection	Jan-22	0.91	--
IRZ-27	Upper / Upper Middle	Injection	Feb-22	0.73	--
IRZ-27	Upper / Upper Middle	Injection	Mar-22	0.57	--
IRZ-27	Upper / Upper Middle	Injection	Apr-22	0.49	--
IRZ-27	Upper / Upper Middle	Injection	May-22	0.60	--
IRZ-27	Upper / Upper Middle	Injection	Jun-22	0.67	0.67
IRZ-27	Lower	Injection	Nov-21	--	--
IRZ-27	Lower	Injection	Dec-21	0.72	--
IRZ-27	Lower	Injection	Jan-22	0.66	--
IRZ-27	Lower	Injection	Feb-22	0.57	--
IRZ-27	Lower	Injection	Mar-22	0.49	--
IRZ-27	Lower	Injection	Apr-22	0.47	--
IRZ-27	Lower	Injection	May-22	0.39	--
IRZ-27	Lower	Injection	Jun-22	0.49	0.49
IRZ-29	Upper	Injection	Nov-21	--	--
IRZ-29	Upper	Injection	Dec-21	--	--
IRZ-29	Upper	Injection	Jan-22	0.47	--
IRZ-29	Upper	Injection	Feb-22	0.55	--
IRZ-29	Upper	Injection	Mar-22	0.43	--
IRZ-29	Upper	Injection	Apr-22	0.41	--
IRZ-29	Upper	Injection	May-22	0.36	--
IRZ-29	Upper	Injection	Jun-22	0.41	0.41

**Table 3.3**

**Summary of NTH IRZ Well Specific Capacities**  
**Second Quarter 2022 Well Performance Report**  
**Pacific Gas and Electric Company, Topock Compressor Station, Needles, California**

Well ID	Aquifer Interval	Well Type	Operating Period	Monthly Average Specific Capacity (gpm/ft)	Baseline Specific Capacity
IRZ-29	Lower	Injection	Nov-21	--	--
IRZ-29	Lower	Injection	Dec-21	--	--
IRZ-29	Lower	Injection	Jan-22	0.89	--
IRZ-29	Lower	Injection	Feb-22	0.65	--
IRZ-29	Lower	Injection	Mar-22	0.55	--
IRZ-29	Lower	Injection	Apr-22	0.52	--
IRZ-29	Lower	Injection	May-22	0.47	--
IRZ-29	Lower	Injection	Jun-22	0.52	0.52
IRZ-31	Upper	Injection	Nov-21	--	--
IRZ-31	Upper	Injection	Dec-21	--	--
IRZ-31	Upper	Injection	Jan-22	1.1	--
IRZ-31	Upper	Injection	Feb-22	0.71	--
IRZ-31	Upper	Injection	Mar-22	0.56	--
IRZ-31	Upper	Injection	Apr-22	0.52	--
IRZ-31	Upper	Injection	May-22	0.51	--
IRZ-31	Upper	Injection	Jun-22	0.58	0.58
IRZ-31	Lower	Injection	Nov-21	--	--
IRZ-31	Lower	Injection	Dec-21	--	--
IRZ-31	Lower	Injection	Jan-22	1.1	--
IRZ-31	Lower	Injection	Feb-22	0.55	--
IRZ-31	Lower	Injection	Mar-22	0.44	--
IRZ-31	Lower	Injection	Apr-22	0.40	--
IRZ-31	Lower	Injection	May-22	0.41	--
IRZ-31	Lower	Injection	Jun-22	0.46	0.46
IRZ-33	Upper	Injection	Nov-21	--	--
IRZ-33	Upper	Injection	Dec-21	--	--
IRZ-33	Upper	Injection	Jan-22	0.84	--
IRZ-33	Upper	Injection	Feb-22	0.69	--
IRZ-33	Upper	Injection	Mar-22	0.49	--
IRZ-33	Upper	Injection	Apr-22	--	--
IRZ-33	Upper	Injection	May-22	0.52	--
IRZ-33	Upper	Injection	Jun-22	0.50	0.50
IRZ-33	Lower	Injection	Nov-21	--	--
IRZ-33	Lower	Injection	Dec-21	--	--
IRZ-33	Lower	Injection	Jan-22	0.54	--
IRZ-33	Lower	Injection	Feb-22	0.48	--
IRZ-33	Lower	Injection	Mar-22	0.35	--
IRZ-33	Lower	Injection	Apr-22	--	--
IRZ-33	Lower	Injection	May-22	0.35	--
IRZ-33	Lower	Injection	Jun-22	0.36	0.36
IRZ-35	Upper	Injection	Nov-21	--	--
IRZ-35	Upper	Injection	Dec-21	--	--
IRZ-35	Upper	Injection	Jan-22	0.87	--
IRZ-35	Upper	Injection	Feb-22	0.63	--
IRZ-35	Upper	Injection	Mar-22	0.47	--
IRZ-35	Upper	Injection	Apr-22	0.54	--

**Table 3.3**

**Summary of NTH IRZ Well Specific Capacities**  
**Second Quarter 2022 Well Performance Report**  
**Pacific Gas and Electric Company, Topock Compressor Station, Needles, California**

Well ID	Aquifer Interval	Well Type	Operating Period	Monthly Average Specific Capacity (gpm/ft)	Baseline Specific Capacity
IRZ-35	Upper	Injection	May-22	0.42	--
IRZ-35	Upper	Injection	Jun-22	0.48	0.48
IRZ-37	Upper	Injection	Nov-21	--	--
IRZ-37	Upper	Injection	Dec-21	--	--
IRZ-37	Upper	Injection	Jan-22	0.53	--
IRZ-37	Upper	Injection	Feb-22	0.48	--
IRZ-37	Upper	Injection	Mar-22	0.33	--
IRZ-37	Upper	Injection	Apr-22	--	--
IRZ-37	Upper	Injection	May-22	0.34	--
IRZ-37	Upper	Injection	Jun-22	0.35	0.35
IRZ-39	Upper	Injection	Nov-21	--	--
IRZ-39	Upper	Injection	Dec-21	--	--
IRZ-39	Upper	Injection	Jan-22	--	--
IRZ-39	Upper	Injection	Feb-22	0.79	--
IRZ-39	Upper	Injection	Mar-22	0.20	--
IRZ-39	Upper	Injection	Apr-22	0.11	--
IRZ-39	Upper	Injection	May-22	--	--
IRZ-39	Upper	Injection	Jun-22	--	--
IRZ-9	Upper	Extraction	Nov-21	--	--
IRZ-9	Upper	Extraction	Dec-21	--	--
IRZ-9	Upper	Extraction	Jan-22	2.0	--
IRZ-9	Upper	Extraction	Feb-22	--	--
IRZ-9	Upper	Extraction	Mar-22	0.72	--
IRZ-9	Upper	Extraction	Apr-22	--	--
IRZ-9	Upper	Extraction	May-22	--	--
IRZ-9	Upper	Extraction	Jun-22	--	--
IRZ-13D	Lower	Extraction	Nov-21	--	--
IRZ-13D	Lower	Extraction	Dec-21	--	--
IRZ-13D	Lower	Extraction	Jan-22	--	--
IRZ-13D	Lower	Extraction	Feb-22	--	--
IRZ-13D	Lower	Extraction	Mar-22	--	--
IRZ-13D	Lower	Extraction	Apr-22	--	--
IRZ-13D	Lower	Extraction	May-22	17	--
IRZ-13D	Lower	Extraction	Jun-22	13	13
IRZ-13S	Upper	Extraction	Nov-21	--	--
IRZ-13S	Upper	Extraction	Dec-21	--	--
IRZ-13S	Upper	Extraction	Jan-22	--	--
IRZ-13S	Upper	Extraction	Feb-22	--	--
IRZ-13S	Upper	Extraction	Mar-22	5.5	--
IRZ-13S	Upper	Extraction	Apr-22	5.9	--
IRZ-13S	Upper	Extraction	May-22	6.5	--
IRZ-13S	Upper	Extraction	Jun-22	7.9	7.9
IRZ-23	Lower	Extraction	Nov-21	--	--
IRZ-23	Lower	Extraction	Dec-21	13	--
IRZ-23	Lower	Extraction	Jan-22	360	--

**Table 3.3****Summary of NTH IRZ Well Specific Capacities****Second Quarter 2022 Well Performance Report****Pacific Gas and Electric Company, Topock Compressor Station, Needles, California**

Well ID	Aquifer Interval	Well Type	Operating Period	Monthly Average Specific Capacity (gpm/ft)	Baseline Specific Capacity
IRZ-23	Lower	Extraction	Feb-22	21	--
IRZ-23	Lower	Extraction	Mar-22	47	--
IRZ-23	Lower	Extraction	Apr-22	110	--
IRZ-23	Lower	Extraction	May-22	850	--
IRZ-23	Lower	Extraction	Jun-22	660	660

**Notes:**

1. Specific capacities are calculated on five-minute intervals as flowrates measured from flowmeters divided by the change in water level measured from transducers compared to baseline. Baseline static water levels were adjusted by the typically observed difference in water levels at time of development and January, which is the month where water levels are at their lowest at the Site. Average monthly specific capacities were then calculated by averaging the five-minute interval specific capacities.
2. Water level data was not collected for well IRZ-13D in March and April 2022 due to a SCADA error and therefore specific capacities were not calculated.

**Acronyms and Abbreviations:**

-- = not operating or not applicable due to baseline not having been established yet

btoc = below top of casing

ft = foot

gpm = gallon per minute

ID = identification

IRZ = in-situ reactive zone

NTH = National Trails Highway

SCADA = supervisory data control and acquisition

**Table 3.5****Second Quarter 2022 Field Parameters****Second Quarter 2022 Well Performance Report****Pacific Gas and Electric Company, Topock Compressor Station, Needles, California**

Well ID	Sample Date	pH	Specific Conductance ( $\mu\text{S}/\text{cm}$ )	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (deg C)	Salinity (ppt)	Total Dissolved Solids (mg/L)	ORP (mV)
C-BNS	05/18/2022	8.3	943	6.0	10.91	18.60	0.47	610	12.6
C-CON-D	05/19/2022	8.4	945	4.0	11.05	18.80	0.47	610	107.5
C-CON-S	05/19/2022	8.3	942	5.0	9.96	18.80	0.47	610	115.9
C-I-3-D	05/18/2022	8.1	937	4.0	3.23	18.50	0.47	610	32.6
C-I-3-S	05/18/2022	8.1	945	5.0	1.51	18.40	0.47	620	37.6
C-MAR-D	05/19/2022	8.4	951	6.0	11.01	19.30	0.47	610	113.7
C-MAR-S	05/19/2022	8.3	949	3.0	9.98	19.30	0.47	610	116.6
C-NR1-D	05/19/2022	8.3	944	3.0	10.08	18.70	0.47	610	118.3
C-NR1-S	05/19/2022	8.3	951	4.0	10.11	18.90	0.47	610	119.1
C-NR3-D	05/19/2022	8.3	948	2.0	10.08	18.80	0.47	610	119.4
C-NR3-S	05/19/2022	8.3	945	1.0	9.91	19.10	0.47	610	117.8
C-NR4-D	05/19/2022	8.3	955	5.0	10.82	18.60	0.47	610	116.1
C-NR4-S	05/19/2022	8.3	947	3.0	9.98	18.60	0.47	610	118.5
C-R22A-D	05/18/2022	8.2	943	7.0	3.23	19.30	0.47	610	13.1
C-R22A-S	05/18/2022	8.2	947	2.0	2.09	19.60	0.47	610	23.9
C-R27-D	05/18/2022	8.3	948	8.0	9.54	18.60	0.47	610	19.7
C-R27-S	05/18/2022	8.3	948	7.0	11.61	18.70	0.47	600	19.8
C-TAZ-D	05/18/2022	8.3	970	5.0	3.68	18.70	0.48	520	4.0
C-TAZ-S	05/18/2022	8.3	946	3.0	4.16	18.80	0.47	610	20.0
IRZ-09-100	4/12/2022	7.86	20,051	24.39	1.38	28.2	--	--	27
IRZ-09-100	05/18/2022	8.0	8,739	21.3	1.32	27.90	0.00	nm	1.5
IRZ-09-100	06/13/2022	7.7	11,666	21.2	2.50	31.80	0.00	0	-18.3
IRZ-13D-210	4/12/2022	7.82	20,008	0	3.29	26.8	--	--	83.9
IRZ-13D-210	05/17/2022	7.7	20,378	1.0	2.10	29.70	0.00	nm	-6.1
IRZ-13D-210	06/13/2022	7.7	21,865	0.9	2.00	29.60	0.00	0	9.7
IRZ-13S-095	4/12/2022	7.71	6,721	0	2	27.1	--	--	11.1
IRZ-13S-095	05/17/2022	7.9	10,036	6.8	1.87	29.20	0.00	nm	-7.9
IRZ-13S-095	06/13/2022	7.9	10,179	6.8	2.39	28.90	0.00	0	17.3

**Table 3.5****Second Quarter 2022 Field Parameters****Second Quarter 2022 Well Performance Report****Pacific Gas and Electric Company, Topock Compressor Station, Needles, California**

Well ID	Sample Date	pH	Specific Conductance ( $\mu\text{S}/\text{cm}$ )	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (deg C)	Salinity (ppt)	Total Dissolved Solids (mg/L)	ORP (mV)
MW-09	06/08/2022	7.8	3,462	4.0	0.12	32.70	1.92	2,390	43.2
MW-10	06/08/2022	7.8	2,988	8.0	4.55	32.30	1.52	1,920	81.5
MW-10D	06/08/2022	7.8	4,426	6.0	3.90	31.50	2.01	2,500	82.4
MW-11	06/08/2022	8.0	2,091	4.0	6.38	31.80	1.05	1,340	77.1
MW-11D	06/08/2022	7.6	6,526	4.0	2.75	31.70	3.30	4,000	77.2
MW-12	06/08/2022	7.7	7,588	13.0	4.28	30.70	4.10	4,920	-165.3
MW-13	06/16/2022	7.8	3,321	6.0	3.73	30.40	1.74	2,170	77.9
MW-14	06/16/2022	7.8	3,449	27.0	5.73	33.20	1.74	2,160	70.3
MW-15	06/14/2022	7.7	2,144	2.0	4.89	27.90	1.09	1,390	77.3
MW-19	06/17/2022	7.8	2,293	4.0	5.60	29.60	1.18	1,500	104.1
MW-20-070	04/14/2022	7.9	2,440	7.0	8.05	29.90	1.25	1,590	81.8
MW-20-070	05/20/2022	7.6	2,556	15.0	7.91	30.30	1.30	1,650	108.8
MW-20-070	06/13/2022	7.3	3,242	10.0	7.24	30.90	1.50	1,890	49.9
MW-20-100	04/14/2022	7.1	5,925	7.0	1.50	29.90	3.12	3,780	88.9
MW-20-100	05/20/2022	7.8	5,365	5.0	0.24	29.90	2.85	3,450	-105.5
MW-20-100	06/13/2022	7.7	5,737	7.0	0.96	30.60	2.78	3,380	43.6
MW-20-130	04/14/2022	7.4	13,347	7.0	0.34	29.90	7.92	8,980	81.0
MW-20-130	05/20/2022	7.7	14,072	10.0	0.30	29.60	8.00	9,030	-102.6
MW-20-130	06/13/2022	7.4	14,489	4.0	0.43	31.40	7.34	8,350	50.9
MW-21	04/12/2022	7.5	10,369	8.0	0.91	27.50	5.95	7,470	5.3
MW-21	05/18/2022	7.1	10,997	6.0	0.95	35.10	6.15	7,150	109.6
MW-21	06/14/2022	7.9	11,509	5.0	0.77	32.00	5.65	6,590	-73.3
MW-22	05/05/2022	7.1	12,581	31.0	0.05	25.60	7.78	8,780	32.4
MW-23-060	06/09/2022	9.9	18,010	4.0	2.45	30.50	0.11	11,770	85.4
MW-23-080	06/09/2022	10.7	18,630	33.0	0.38	29.90	0.11	12,170	81.9
MW-24A	06/16/2022	8.0	2,146	7.0	1.06	30.70	1.08	1,380	-37.1
MW-24B	06/16/2022	7.6	19,529	3.0	0.67	30.40	0.12	12,680	-192.5
MW-24BR	06/17/2022	8.2	15,379	1.0	0.11	30.60	8.89	9,980	-252.8

**Table 3.5****Second Quarter 2022 Field Parameters****Second Quarter 2022 Well Performance Report****Pacific Gas and Electric Company, Topock Compressor Station, Needles, California**

Well ID	Sample Date	pH	Specific Conductance ( $\mu\text{S}/\text{cm}$ )	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (deg C)	Salinity (ppt)	Total Dissolved Solids (mg/L)	ORP (mV)
MW-25	06/14/2022	7.4	2,136	7.0	4.79	30.90	1.08	1,380	68.5
MW-26	04/13/2022	7.1	7,195	6.0	1.17	30.00	4.09	4,810	82.5
MW-26	05/20/2022	6.9	9,739	8.0	4.38	28.50	5.45	6,330	96.5
MW-26	06/14/2022	7.3	9,873	8.0	1.00	31.50	5.40	6,290	82.1
MW-27-020	05/05/2022	7.5	1,201	2.0	4.18	20.10	0.60	780	9.0
MW-27-060	05/05/2022	7.4	1,055	8.0	0.70	20.20	0.52	670	-76.2
MW-27-085	05/05/2022	7.1	10,782	5.0	2.12	20.60	6.12	6,990	-44.2
MW-28-025	05/04/2022	7.3	1,051	8.0	1.59	23.10	0.52	670	-16.1
MW-28-090	05/04/2022	7.1	5,191	6.0	0.70	21.50	2.80	3,370	-72.1
MW-29	06/13/2022	7.3	3,927	7.0	0.62	25.60	2.07	2,550	-118.9
MW-30-030	05/03/2022	8.0	1,990	19.0	0.16	24.90	1.06	1,350	51.3
MW-30-050	05/03/2022	7.8	1,390	8.0	5.90	24.60	0.70	910	83.9
MW-30-050	06/17/2022	7.8	1,168	6.0	0.30	23.80	0.60	780	-40.3
MW-31-060	04/12/2022	7.7	10,070	5.0	0.02	29.10	5.61	6,530	-156.2
MW-31-060	05/20/2022	7.2	9,492	5.0	0.29	30.70	5.26	6,110	-183.2
MW-31-060	06/13/2022	8.0	10,603	13.0	0.67	30.90	5.30	6,190	34.8
MW-31-135	04/12/2022	7.8	17,081	5.0	0.11	29.00	0.10	11,113	87.5
MW-31-135	05/20/2022	7.6	16,469	25.0	0.32	29.80	9.63	10,760	-109.1
MW-31-135	06/13/2022	7.4	16,556	45.0	0.93	30.60	8.64	9,760	46.0
MW-32-020	05/04/2022	7.3	11,509	16.0	0.12	24.40	6.54	7,400	1.0
MW-32-035	05/04/2022	7.0	6,729	25.0	0.14	25.30	3.72	4,420	79.3
MW-33-040	06/09/2022	7.4	12,630	20.0	0.31	26.60	6.97	7,930	-190.0
MW-33-090	06/09/2022	7.9	9,201	29.0	0.34	26.50	4.96	5,810	-184.4
MW-33-150	06/09/2022	8.1	15,177	33.0	0.51	27.90	8.31	9,360	-190.0
MW-33-210	06/09/2022	8.0	19,181	30.0	0.55	27.80	0.11	11,950	-183.7
MW-34-055	05/05/2022	7.5	922	6.0	0.22	20.90	0.45	590	-33.0
MW-34-080	05/05/2022	7.0	8,561	5.0	0.18	20.20	4.76	5,530	-62.5
MW-34-080	06/17/2022	7.6	9,396	2.0	1.15	19.50	5.28	6,090	-96.2

**Table 3.5****Second Quarter 2022 Field Parameters****Second Quarter 2022 Well Performance Report****Pacific Gas and Electric Company, Topock Compressor Station, Needles, California**

<b>Well ID</b>	<b>Sample Date</b>	<b>pH</b>	<b>Specific Conductance (<math>\mu\text{S}/\text{cm}</math>)</b>	<b>Turbidity (NTU)</b>	<b>Dissolved Oxygen (mg/L)</b>	<b>Temperature (deg C)</b>	<b>Salinity (ppt)</b>	<b>Total Dissolved Solids (mg/L)</b>	<b>ORP (mV)</b>
MW-34-100	05/05/2022	7.2	10,196	2.0	0.29	20.00	5.79	6,650	-50.1
MW-35-060	06/07/2022	7.6	6,295	8.0	1.36	28.50	3.33	3,390	80.9
MW-35-135	06/07/2022	7.6	11,717	9.0	0.27	28.20	6.68	7,660	82.5
MW-36-020	05/04/2022	7.4	1,295	6.0	0.15	23.40	0.65	840	44.9
MW-36-040	05/04/2022	8.0	1,132	4.0	0.12	22.60	0.54	700	20.3
MW-36-050	05/04/2022	7.6	1,026	6.0	0.19	22.90	0.49	650	89.4
MW-36-070	05/04/2022	6.6	1,076	5.0	0.24	25.00	0.51	660	160.2
MW-36-090	05/04/2022	7.6	5,815	9.0	0.14	25.00	2.02	2,490	68.5
MW-36-090	06/17/2022	7.5	4,913	15.0	0.27	22.00	2.81	3,290	2.6
MW-36-100	05/04/2022	4.4	5,740	4.0	0.16	23.10	3.07	3,680	212.6
MW-36-100	06/17/2022	7.6	5,638	5.0	0.26	21.70	3.30	3,930	-53.3
MW-37D	06/16/2022	7.8	11,120	6.0	2.52	30.50	6.23	7,180	110.3
MW-37S	06/16/2022	8.1	7,694	21.0	1.33	30.20	4.29	5,070	79.3
MW-38D	06/08/2022	8.0	20,421	44.0	0.03	31.50	0.10	11,300	-9.4
MW-38S	06/08/2022	7.4	2,522	11.0	3.76	37.20	1.02	1,330	-163.1
MW-39-040	05/03/2022	8.1	1,101	28.0	0.21	25.60	0.54	710	-6.6
MW-39-040	06/15/2022	7.8	974	6.0	0.25	22.60	0.50	660	-86.8
MW-39-050	05/03/2022	7.8	1,039	5.0	0.23	25.30	0.52	680	90.3
MW-39-050	06/15/2022	7.8	936	9.0	0.34	22.70	0.48	630	53.6
MW-39-060	05/03/2022	6.3	1,096	21.0	0.89	25.00	0.55	720	167.4
MW-39-060	06/15/2022	7.3	1,034	9.0	0.52	24.70	0.51	670	15.8
MW-39-070	05/03/2022	7.8	3,097	9.0	6.31	27.10	1.35	1,720	93.5
MW-39-070	06/15/2022	7.2	3,247	3.0	0.14	22.20	1.81	2,220	10.2
MW-39-080	05/03/2022	6.9	6,116	5.0	1.60	26.50	2.57	3,130	127.1
MW-39-080	06/15/2022	8.0	7,265	6.0	0.14	23.80	4.14	4,890	5.6
MW-39-100	05/03/2022	5.1	12,733	30.0	0.91	25.40	0.11	12,480	209.5
MW-39-100	06/15/2022	7.8	12,453	4.0	0.55	24.60	7.13	8,090	19.0
MW-40D	06/16/2022	7.3	14,839	5.0	0.45	29.90	8.56	9,630	-19.5

**Table 3.5****Second Quarter 2022 Field Parameters****Second Quarter 2022 Well Performance Report****Pacific Gas and Electric Company, Topock Compressor Station, Needles, California**

Well ID	Sample Date	pH	Specific Conductance ( $\mu\text{S}/\text{cm}$ )	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (deg C)	Salinity (ppt)	Total Dissolved Solids (mg/L)	ORP (mV)
MW-40S	06/16/2022	7.9	3,046	5.0	3.85	28.50	1.57	1,980	25.7
MW-41D	06/16/2022	8.0	16,472	4.0	0.41	30.60	9.77	10,890	68.4
MW-41M	06/16/2022	8.1	14,261	14.0	0.22	30.60	8.02	9,080	59.9
MW-41S	06/16/2022	8.2	7,390	34.0	5.25	30.50	4.00	4,750	60.1
MW-42-030	05/05/2022	8.6	1,100	8.0	0.06	23.10	0.60	780	10.2
MW-42-055	05/05/2022	8.4	1,163	6.0	0.10	22.80	0.59	770	47.7
MW-42-065	05/05/2022	7.8	7,225	6.0	0.10	23.60	4.59	5,360	60.7
MW-43-025	05/03/2022	7.1	2,160	40.0	0.40	22.50	1.10	1,400	-83.1
MW-43-075	05/03/2022	7.0	11,503	31.0	0.75	23.00	6.57	7,500	-82.6
MW-43-090	05/03/2022	7.1	17,793	22.0	0.75	23.00	0.11	11,610	-58.7
MW-44-070	05/06/2022	7.3	2,461	6.0	0.61	21.10	1.27	1,590	-63.6
MW-44-115	05/06/2022	7.5	10,720	4.0	0.59	21.70	6.01	6,940	-62.1
MW-44-115	06/17/2022	7.7	9,563	5.0	0.25	22.00	5.68	6,550	-12.6
MW-44-125	05/06/2022	7.7	11,440	14.0	0.35	21.70	6.48	7,370	-120.6
MW-44-125	06/17/2022	7.5	10,643	4.0	0.82	21.60	6.49	7,400	10.1
MW-45-095A	05/04/2022	7.0	8,819	5.0	0.27	21.60	4.93	5,720	-26.9
MW-45-095A	06/17/2022	7.6	9,592	3.0	0.43	20.30	5.41	6,230	-22.1
MW-46-175	05/05/2022	8.0	17,714	6.0	0.70	21.40	0.10	11,510	13.0
MW-46-205	05/05/2022	8.0	20,646	7.0	0.41	22.00	0.12	13,420	8.7
MW-47-055	06/07/2022	8.1	4,976	30.0	0.45	29.50	2.63	3,220	-174.7
MW-47-115	06/07/2022	7.9	13,387	9.0	0.50	29.10	7.13	8,130	-184.8
MW-48	06/10/2022	8.1	17,311	13.0	2.28	30.40	0.10	11,240	-171.1
MW-49-135	06/13/2022	7.8	14,520	7.0	0.25	27.30	8.41	9,420	-41.6
MW-49-275	06/13/2022	8.4	25,233	5.0	0.44	25.50	0.15	16,400	-70.2
MW-49-365	06/13/2022	7.7	36,976	2.0	0.67	25.70	0.23	24,050	-15.4
MW-50-095	06/17/2022	8.1	6,571	8.0	1.09	29.80	3.66	4,350	93.5
MW-50-200	06/17/2022	8.0	20,953	4.0	0.44	30.70	0.12	13,400	103.0
MW-51	04/13/2022	7.7	11,137	3.0	1.41	29.80	6.35	7,280	85.1

**Table 3.5****Second Quarter 2022 Field Parameters****Second Quarter 2022 Well Performance Report****Pacific Gas and Electric Company, Topock Compressor Station, Needles, California**

Well ID	Sample Date	pH	Specific Conductance ( $\mu\text{S}/\text{cm}$ )	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (deg C)	Salinity (ppt)	Total Dissolved Solids (mg/L)	ORP (mV)
MW-51	05/20/2022	7.5	11,617	7.0	1.75	29.40	6.56	7,540	65.9
MW-51	06/14/2022	7.8	10,686	7.0	0.93	30.80	6.02	6,960	86.5
MW-52D	05/03/2022	7.5	20,516	3.0	0.43	25.60	0.12	13,370	-70.8
MW-52M	05/03/2022	7.6	15,941	9.0	0.17	23.60	9.36	10,400	-120.7
MW-52S	05/03/2022	7.6	11,467	36.0	0.16	23.20	6.50	7,410	-121.9
MW-53D	05/03/2022	7.7	25,146	5.0	0.24	28.70	0.15	16,410	-96.6
MW-53M	05/03/2022	7.8	19,604	11.0	0.28	23.80	0.12	12,740	-111.5
MW-53S	05/03/2022	7.0	1,408	7.0	0.32	23.80	0.70	910	-132.1
MW-54-085	06/15/2022	7.7	9,785	2.0	1.04	27.70	5.48	6,360	-26.5
MW-54-140	06/15/2022	7.9	13,728	2.0	0.21	26.90	7.90	8,900	-69.2
MW-54-195	06/15/2022	8.2	20,374	2.0	0.45	27.50	0.12	13,240	-145.2
MW-55-045	06/14/2022	8.4	1,328	36.0	0.34	28.60	0.61	800	-55.5
MW-55-120	06/14/2022	8.6	7,631	3.0	1.23	29.60	3.77	4,490	9.8
MW-56D	06/14/2022	7.8	21,642	4.0	0.53	26.70	0.13	13,520	-23.0
MW-56M	06/14/2022	7.9	13,951	7.0	0.31	23.40	8.35	9,360	-93.6
MW-56S	06/14/2022	7.8	5,994	3.0	0.38	26.00	3.25	3,880	-107.1
MW-57-070	06/07/2022	7.4	1,610	4.0	4.31	31.80	0.83	1,070	79.1
MW-57-185	06/07/2022	11.0	18,468	8.0	0.10	29.90	0.11	11,830	58.9
MW-58BR	06/21/2022	7.7	7,945	6.0	2.85	29.50	4.37	5,160	41.2
MW-59-100	06/09/2022	7.4	13,794	33.0	4.56	33.20	8.02	9,110	91.1
MW-60-125	06/16/2022	7.6	9,515	9.0	1.15	29.50	5.31	6,180	-7.5
MW-60BR-245	06/16/2022	9.0	19,088	3.0	1.25	29.20	0.11	12,430	-9.2
MW-61-110	06/16/2022	7.7	18,215	8.0	1.02	29.80	0.11	11,840	-25.3
MW-62-065	06/09/2022	8.1	6,902	5.0	2.30	32.80	3.59	4,310	86.0
MW-62-110	06/22/2022	7.5	13,197	2.0	0.38	27.40	7.56	8,570	-211.6
MW-62-190	06/22/2022	7.5	20,188	2.0	0.23	27.53	0.12	13,140	-229.6
MW-63-065	06/09/2022	7.7	6,641	8.0	2.09	28.20	3.48	4,170	99.0
MW-64BR	06/22/2022	7.7	14,727	3.0	0.67	29.70	8.51	9,570	-120.2

**Table 3.5****Second Quarter 2022 Field Parameters****Second Quarter 2022 Well Performance Report****Pacific Gas and Electric Company, Topock Compressor Station, Needles, California**

<b>Well ID</b>	<b>Sample Date</b>	<b>pH</b>	<b>Specific Conductance (<math>\mu\text{S}/\text{cm}</math>)</b>	<b>Turbidity (NTU)</b>	<b>Dissolved Oxygen (mg/L)</b>	<b>Temperature (deg C)</b>	<b>Salinity (ppt)</b>	<b>Total Dissolved Solids (mg/L)</b>	<b>ORP (mV)</b>
MW-65-160	06/21/2022	7.3	4,721	19.0	2.93	30.60	2.50	3,060	31.4
MW-65-225	06/21/2022	7.4	11,068	7.0	0.78	30.60	6.45	7,400	-30.2
MW-66-165	06/06/2022	7.7	3,580	50.0	3.73	35.30	1.87	2,330	-116.7
MW-66-230	06/06/2022	7.6	18,992	48.0	1.60	34.20	0.11	12,350	-140.0
MW-66BR-270	06/20/2022	8.2	14,746	14.0	0.38	30.60	8.52	9,600	-189.6
MW-67-185	05/20/2022	7.6	5,763	47.0	1.05	30.90	3.09	3,790	87.1
MW-67-185	06/22/2022	7.3	5,409	43.0	2.23	30.30	2.86	3,510	42.9
MW-67-225	06/21/2022	8.1	5,705	32.0	2.65	30.70	3.04	3,690	36.6
MW-67-260	06/21/2022	9.4	20,539	22.0	1.53	30.40	0.12	13,310	57.1
MW-68-180	4/14/2022	8.1	3,968	8.0	4.81	28.60	2.08	2,570	45.3
MW-68-180	05/20/2022	7.4	3,311	17.0	4.62	30.20	1.72	2,150	84.5
MW-68-180	06/14/2022	7.6	3,152	9.0	2.63	30.60	1.63	2,050	41.9
MW-68-240	06/14/2022	7.6	17,831	8.0	1.25	30.50	0.10	11,570	-13.2
MW-68BR-280	06/14/2022	9.1	23,055	2.0	0.41	31.90	0.14	14,990	-145.1
MW-69-195	06/20/2022	7.4	3,443	14.0	1.54	30.90	1.77	2,220	16.5
MW-70-105	06/21/2022	7.8	3,591	8.0	3.38	27.80	1.88	2,330	52.6
MW-70BR-225	06/21/2022	8.8	12,871	4.0	1.72	29.50	7.36	8,360	45.7
MW-70BR-287	06/21/2022	9.2	17,497	4.0	0.51	28.70	0.10	11,370	-88.3
MW-71-035	04/12/2022	7.2	16,534	9.0	0.73	27.80	0.10	11,290	76.4
MW-71-035	05/18/2022	6.7	15,471	21.0	1.11	31.10	8.94	10,040	118.0
MW-71-035	06/15/2022	7.1	16,145	9.0	1.35	30.60	9.35	10,510	-13.1
MW-72-080	06/17/2022	7.8	17,195	45.0	1.02	27.40	0.10	11,180	-15.9
MW-72BR-200	06/17/2022	8.5	17,057	7.0	0.68	27.30	9.98	11,070	-125.2
MW-73-080	06/17/2022	7.6	11,088	8.0	1.18	26.10	6.27	7,190	-7.3
MW-74-240	06/20/2022	8.1	807	8.0	1.38	28.80	0.40	520	-48.1
MW-75-033	06/07/2022	8.2	5,297	15.0	2.20	28.30	2.66	3,240	-177.7
MW-75-117	06/07/2022	8.3	11,016	14.0	0.90	29.30	5.72	6,640	-194.2
MW-75-202	06/07/2022	8.1	16,020	7.0	0.43	32.20	9.27	10,390	-230.0

**Table 3.5****Second Quarter 2022 Field Parameters****Second Quarter 2022 Well Performance Report****Pacific Gas and Electric Company, Topock Compressor Station, Needles, California**

<b>Well ID</b>	<b>Sample Date</b>	<b>pH</b>	<b>Specific Conductance (<math>\mu\text{S}/\text{cm}</math>)</b>	<b>Turbidity (NTU)</b>	<b>Dissolved Oxygen (mg/L)</b>	<b>Temperature (deg C)</b>	<b>Salinity (ppt)</b>	<b>Total Dissolved Solids (mg/L)</b>	<b>ORP (mV)</b>
MW-75-267	06/07/2022	8.2	22,302	12.0	0.56	31.50	0.13	14,490	-297.5
MW-75-337	06/07/2022	8.3	28,410	42.0	0.33	36.80	0.17	18,480	-267.2
MW-76-039	04/11/2022	7.7	4,104	9.0	3.17	29.30	2.07	2,680	73.0
MW-76-039	05/16/2022	8.0	4,281	9.0	3.15	29.30	2.26	2,780	26.3
MW-76-039	06/13/2022	7.7	4,274	4.0	3.99	29.40	2.37	2,390	121.1
MW-76-156	04/11/2022	7.7	17,605	5.0	0.22	28.80	0.10	11,350	71.1
MW-76-156	05/16/2022	8.0	16,393	8.0	0.40	29.80	9.52	10,620	-47.6
MW-76-156	06/13/2022	7.8	16,737	3.0	0.28	29.60	9.34	10,450	74.5
MW-76-181	04/11/2022	7.5	20,251	8.0	0.49	28.60	0.12	13,050	83.6
MW-76-181	05/16/2022	7.6	19,680	27.0	0.33	29.30	0.12	12,800	-7.4
MW-76-181	06/13/2022	7.6	20,699	44.0	0.52	29.30	0.12	13,370	78.3
MW-76-218	04/11/2022	8.1	20,915	8.0	0.20	28.70	0.11	11,700	91.7
MW-76-218	05/16/2022	7.6	21,709	2.0	0.26	30.10	0.13	14,100	-30.1
MW-76-218	06/13/2022	8.1	22,720	8.0	0.22	29.70	0.14	14,700	79.9
MW-77-046	05/02/2022	7.7	6,280	9.0	0.33	27.10	3.39	4,040	39.2
MW-77-046	06/15/2022	5.8	6,689	36.0	0.13	27.30	3.65	4,360	162.9
MW-77-102	05/02/2022	7.7	9,601	5.0	0.37	26.50	5.33	6,180	88.1
MW-77-102	06/15/2022	7.9	10,594	7.0	0.15	27.80	6.02	6,920	76.9
MW-77-158	05/02/2022	7.9	11,336	3.0	0.39	27.50	6.34	7,280	85.5
MW-77-158	06/15/2022	8.2	10,171	17.0	0.24	28.10	5.73	6,630	74.4
MW-77-187	05/02/2022	8.1	20,851	4.0	0.43	27.40	0.12	13,190	92.2
MW-77-187	06/15/2022	8.5	19,109	5.0	0.14	27.90	0.10	11,200	72.8
MW-78-070	04/13/2022	7.5	4,294	5.0	3.36	30.10	2.19	2,700	80.4
MW-78-070	05/19/2022	7.0	6,610	43.0	2.93	31.20	3.57	4,270	109.2
MW-78-070	06/14/2022	7.7	8,764	16.0	1.16	30.90	4.14	4,770	22.5
MW-78-142	04/13/2022	7.6	11,321	5.0	3.49	29.80	6.17	7,160	84.7
MW-78-142	05/19/2022	7.2	11,757	18.0	0.45	30.70	6.60	7,590	-61.0
MW-78-142	06/14/2022	7.7	12,320	27.0	0.49	31.00	6.35	7,350	85.8

**Table 3.5****Second Quarter 2022 Field Parameters****Second Quarter 2022 Well Performance Report****Pacific Gas and Electric Company, Topock Compressor Station, Needles, California**

<b>Well ID</b>	<b>Sample Date</b>	<b>pH</b>	<b>Specific Conductance (<math>\mu\text{S}/\text{cm}</math>)</b>	<b>Turbidity (NTU)</b>	<b>Dissolved Oxygen (mg/L)</b>	<b>Temperature (deg C)</b>	<b>Salinity (ppt)</b>	<b>Total Dissolved Solids (mg/L)</b>	<b>ORP (mV)</b>
MW-79-058	04/13/2022	7.7	3,163	8.0	3.95	30.10	1.65	2,060	78.9
MW-79-058	05/19/2022	7.3	3,133	18.0	4.99	30.90	1.62	2,030	98.5
MW-79-058	06/14/2022	7.8	3,501	5.0	5.61	31.00	1.84	2,310	85.5
MW-79-102	04/13/2022	7.7	8,413	8.0	0.92	30.20	4.56	5,370	80.3
MW-79-102	05/19/2022	7.2	9,809	7.0	1.33	31.10	5.48	6,380	111.6
MW-79-102	06/14/2022	7.7	10,501	5.0	1.15	31.30	3.90	4,650	85.6
MW-80-057	04/12/2022	7.7	5,739	7.0	3.30	30.30	3.06	3,700	82.1
MW-80-057	05/18/2022	7.3	6,934	10.0	3.08	32.20	3.74	4,480	121.0
MW-80-057	06/14/2022	7.8	6,360	6.0	3.19	32.10	3.47	4,170	89.0
MW-80-082	04/12/2022	7.4	9,252	8.0	0.60	30.90	5.18	6,070	85.2
MW-80-082	05/18/2022	7.3	10,075	16.0	2.15	30.80	5.64	6,640	136.8
MW-80-082	06/14/2022	7.7	10,227	8.0	0.45	31.20	5.68	6,610	90.9
MW-81-043	05/06/2022	7.7	7,438	15.0	0.14	27.60	4.07	4,820	85.2
MW-81-043	06/16/2022	8.0	7,555	47.0	0.25	30.50	3.70	4,420	-22.0
MW-81-098	05/06/2022	7.7	10,585	18.0	0.08	27.30	5.84	6,750	91.9
MW-81-098	06/16/2022	8.2	16,759	26.0	1.20	30.50	8.70	9,810	34.3
MW-82-046	05/02/2022	7.5	12,514	42.0	0.94	26.00	7.01	7,980	-128.6
MW-82-046	06/16/2022	7.8	10,831	17.0	1.21	26.70	5.91	6,810	-98.6
MW-82-112	05/02/2022	7.1	8,837	22.0	0.42	26.40	4.91	5,730	-50.0
MW-82-112	06/16/2022	8.3	10,485	24.0	0.29	28.60	5.52	6,400	-7.8
MW-82-168	05/02/2022	7.1	17,016	14.0	0.40	26.40	0.10	11,190	-35.8
MW-82-168	06/16/2022	7.3	9,298	4.0	0.64	28.10	4.91	5,730	1.5
MW-82-198	05/02/2022	7.5	19,112	39.0	0.38	27.10	0.11	12,420	-58.6
MW-82-198	06/16/2022	7.5	18,560	26.0	0.27	27.60	0.10	11,530	-3.3
MW-83-090	06/22/2022	7.6	2,617	22.0	4.22	29.80	1.33	1,690	52.9
MW-83-180	06/22/2022	7.7	10,579	8.0	1.03	29.30	5.96	6,880	17.9
MW-83-225	06/22/2022	8.3	16,358	20.0	0.81	29.30	9.52	10,600	14.2
MW-83-245	06/22/2022	8.9	20,047	7.0	0.31	29.30	0.12	13,010	-59.6

**Table 3.5****Second Quarter 2022 Field Parameters****Second Quarter 2022 Well Performance Report****Pacific Gas and Electric Company, Topock Compressor Station, Needles, California**

Well ID	Sample Date	pH	Specific Conductance ( $\mu\text{S}/\text{cm}$ )	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (deg C)	Salinity (ppt)	Total Dissolved Solids (mg/L)	ORP (mV)
MW-84-057	06/06/2022	7.8	2,246	5.0	5.48	30.10	1.16	1,480	54.8
MW-84-095	06/06/2022	7.5	6,667	8.0	0.60	30.90	3.25	4,250	61.9
MW-84-132	06/06/2022	7.5	8,175	5.0	1.39	30.90	4.26	5,050	67.8
MW-84-193	06/06/2022	7.5	10,956	7.0	1.63	31.20	6.03	6,980	69.9
MW-85-129	06/10/2022	7.6	2,221	5.0	6.01	32.20	1.11	1,420	98.5
MW-85-217	06/10/2022	8.0	11,545	47.0	0.17	31.40	6.32	7,290	103.0
MW-85-237	06/10/2022	8.0	17,229	5.0	0.33	31.30	8.56	9,620	64.1
MW-86-030	05/04/2022	7.4	1,135	35.0	0.25	22.00	0.56	740	-95.8
MW-86-066	05/04/2022	7.8	4,776	4.0	0.85	22.70	2.60	3,150	-24.7
MW-86-120	05/04/2022	7.4	11,529	8.0	1.14	21.90	6.55	7,480	6.1
MW-86-140	05/04/2022	7.2	12,562	7.0	0.40	22.00	7.32	8,270	-104.9
MW-87-109	06/08/2022	7.3	2,802	6.0	0.23	31.50	1.27	1,620	-149.0
MW-87-139	06/08/2022	7.1	8,426	5.0	0.18	33.90	3.91	4,680	-159.4
MW-87-192	06/08/2022	7.4	9,280	8.0	0.40	30.80	4.62	5,440	-126.6
MW-87-275	06/08/2022	7.3	11,293	19.0	0.28	30.40	5.75	6,640	-162.2
MW-88-107	06/08/2022	7.9	2,200	8.0	5.21	31.90	1.10	1,410	87.6
MW-89-183	06/16/2022	7.3	7,920	39.0	5.64	32.10	3.79	4,540	180.8
MW-89-273	06/16/2022	8.1	7,981	13.0	6.37	31.20	3.91	4,630	45.4
MW-90-031	05/05/2022	7.4	10,956	8.0	0.06	24.60	5.28	6,120	22.1
MW-91-045	06/15/2022	8.3	2,110	2.0	0.25	26.40	1.05	1,330	-1.6
MW-91-120	06/15/2022	8.0	9,353	5.0	0.37	26.60	5.06	5,920	-1.0
MW-91-170	06/15/2022	8.5	11,303	4.0	0.25	26.50	6.23	7,150	-34.7
MW-91-320	06/15/2022	8.0	29,851	8.0	0.18	27.00	0.18	18,620	-88.4
MW-92-037	06/15/2022	8.4	1,698	2.0	0.47	26.90	0.85	1,100	-145.9
MW-92-072	06/15/2022	8.3	2,443	2.0	0.51	26.90	1.25	1,590	-87.3
MW-92-102	06/15/2022	8.4	3,572	2.0	0.40	26.90	1.87	2,320	-127.1
MW-92-122	06/15/2022	8.1	15,665	2.0	0.29	26.90	9.11	10,160	-215.4
MW-93-050	06/23/2022	7.6	4,871	8.0	2.26	27.20	2.60	3,160	42.9

**Table 3.5****Second Quarter 2022 Field Parameters****Second Quarter 2022 Well Performance Report****Pacific Gas and Electric Company, Topock Compressor Station, Needles, California**

<b>Well ID</b>	<b>Sample Date</b>	<b>pH</b>	<b>Specific Conductance (<math>\mu\text{S}/\text{cm}</math>)</b>	<b>Turbidity (NTU)</b>	<b>Dissolved Oxygen (mg/L)</b>	<b>Temperature (deg C)</b>	<b>Salinity (ppt)</b>	<b>Total Dissolved Solids (mg/L)</b>	<b>ORP (mV)</b>
MW-93-213	06/23/2022	7.7	12,817	7.0	0.46	26.30	7.34	8,330	-25.7
MW-95-113	06/22/2022	7.6	1,516	20.0	3.64	29.30	0.76	980	61.9
MW-95-157	06/22/2022	7.3	5,341	16.0	2.23	29.60	2.87	3,480	16.8
MW-96-045	06/09/2022	7.7	8,563	29.0	0.38	26.80	4.54	5,310	-217.7
MW-96-217	06/09/2022	7.9	18,914	14.0	0.40	27.40	0.11	11,800	-212.0
MW-97-042	06/07/2022	7.8	3,794	7.0	0.66	30.10	2.01	2,490	74.0
MW-97-202	06/07/2022	7.5	19,951	3.0	0.20	29.30	0.12	12,900	-1.1
MW-98-055	06/09/2022	8.1	3,910	4.0	0.81	29.80	2.00	2,480	86.1
MW-98-077	06/09/2022	8.1	7,120	4.0	3.06	30.60	3.48	4,200	97.9
PGE-08	06/10/2022	7.7	21,985	3.0	0.30	33.80	0.11	12,220	-280.8
PT5D	05/05/2022	8.3	10,240	8.0	0.17	26.20	5.96	6,850	83.4
PT5M	05/05/2022	7.3	3,520	20.0	0.14	23.50	1.55	1,880	99.6
PT5S	05/05/2022	5.1	1,379	34.0	0.13	23.70	0.70	910	146.5
PT8D	06/23/2022	7.2	19,047	8.0	1.22	29.40	0.11	12,390	10.5
PT9D	06/23/2022	7.7	18,369	6.0	0.27	29.90	0.11	11,910	25.9
PT9M	06/23/2022	6.9	9,679	7.0	0.68	30.10	5.40	6,290	6.5
PT9S	06/23/2022	7.5	4,065	9.0	1.47	29.80	2.14	2,640	18.6
R-19	05/19/2022	8.3	944	8.0	10.05	19.20	0.46	600	115.5
R-28	05/18/2022	8.3	936	6.0	10.63	19.40	0.47	610	20.7
R63	05/18/2022	8.3	950	8.0	1.26	19.70	0.47	610	11.3
RRB	05/19/2022	8.1	957	9.0	10.08	19.80	0.48	620	118.9
SW1	05/18/2022	8.4	1,111	6.0	6.15	19.80	0.54	710	94.2
SW2	05/18/2022	7.8	988	9.0	6.15	19.40	0.48	640	113.4
TW-02D	04/14/2022	7.8	20,941	8.0	0.23	27.50	0.13	14,090	80.6
TW-02D	05/19/2022	7.2	8,179	6.0	0.37	29.10	4.49	5,270	162.0
TW-02D	06/15/2022	8.0	19,755	9.0	0.20	28.50	0.14	14,870	91.4
TW-02S	04/14/2022	7.8	2,985	4.0	5.10	28.50	1.53	1,930	87.2
TW-02S	05/19/2022	7.8	3,422	5.0	3.87	29.90	1.78	2,220	55.1

**Table 3.5****Second Quarter 2022 Field Parameters****Second Quarter 2022 Well Performance Report****Pacific Gas and Electric Company, Topock Compressor Station, Needles, California**

Well ID	Sample Date	pH	Specific Conductance ( $\mu\text{S}/\text{cm}$ )	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (deg C)	Salinity (ppt)	Total Dissolved Solids (mg/L)	ORP (mV)
TW-02S	06/15/2022	7.9	3,410	4.0	4.57	29.20	1.79	2,220	77.9
TW-03D	04/14/2022	7.5	20,759	7.0	0.22	28.00	0.13	14,520	88.2
TW-03D	05/19/2022	7.4	20,945	9.0	0.26	27.80	0.12	13,560	40.6
TW-03D	06/15/2022	7.7	21,281	9.0	0.11	29.20	0.14	15,320	47.3
TW-04	06/07/2022	8.3	22,622	8.0	0.32	28.50	0.13	13,760	-186.8
TW-05	06/17/2022	8.0	13,941	7.0	0.30	29.60	8.01	9,060	106.0
IRZ-21-157	4/12/2022	8.17	12,160	0	2.03	25.4	--	--	29.7
IRZ-15-055	4/12/2022	8.04	15,685	0	1.53	25.5	--	--	13.5
IRZ-15-200	4/12/2022	7.88	8,602	0	1.38	24.3	--	--	27
IRZ-25-166	4/12/2022	7.73	7,982	0	0.85	27.7	--	--	4.6
IRZ-25-100	4/12/2022	7.89	2,901	0	4.09	27.3	--	--	-4.4
IRZ-21-065	4/12/2022	8.17	10,791	0	1.66	25.4	--	--	12.9
IRZ-23-143	4/12/2022	7.45	6,699	0	2.37	27.4	--	--	14.1
IRZ-23-143	05/17/2022	7.4	20,372	14.8	2.42	29.70	nm	nm	-6.0
IRZ-23-143	06/13/2022	7.6	7,616	18.4	4.28	26.40	nm	nm	64.2

**Abbreviations:**

-- = not available

deg C = degrees Celsius

mg/L = milligrams per liter

mV = millivolts

nm = not measured

NTU = nephelometric turbidity units

ORP = oxidation-reduction potential

ppt = parts per thousand

 $\mu\text{S}/\text{cm}$  = microsiemens per centimeter

Table 4.1

## Monitoring Well Inspection Results

## Second Quarter 2022 Well Performance Report

Pacific Gas and Electric Company, Topock Compressor Station, Needles, California

Well ID	Date	Well Labeled On Casing Or Pad	Traffic Poles Intact	Concrete Pad Intact?	Erosion Around Wellhead?	Steel Casing Or Well Box Intact?	Any Tabs Stripped Or Missing?	Water In Well Box?	J Plug Replaced Properly?	Well Locked At Arrival?	All Bolts Present?	Comments
HNWR-01A-098	5/18/2022	Y	--	Y	N	Y	--	N	Y	Y	--	--
HNWR-01A-174	5/18/2022	Y	--	Y	N	Y	--	N	Y	Y	--	--
IRZ-09-100	6/13/2022	N	--	Y	N	Y	--	N	Y	Y	--	--
IRZ-13D	5/17/2022	--	--	--	--	--	--	--	--	--	--	--
IRZ-13D-210	6/13/2022	N	--	Y	N	Y	--	N	Y	Y	--	--
IRZ-13S	5/17/2022	--	--	--	--	--	--	--	--	--	--	--
IRZ-13S-095	6/13/2022	N	--	Y	N	Y	--	N	Y	Y	--	--
IRZ-23	5/17/2022	--	--	--	--	--	--	--	--	--	--	--
IRZ-23-143	6/13/2022	N	--	Y	N	Y	--	N	Y	Y	--	--
IRZ-9	5/18/2022	Y	--	Y	N	Y	--	--	Y	--	--	--
Marina-1	5/17/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MTS-1	5/17/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MTS-2	5/17/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-09	6/8/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-10	6/8/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-10D	6/8/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-11	6/8/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-11D	6/8/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-12	6/8/2022	Y	Y	Y	N	Y	N	N	Y	Y	Y	--
MW-13	6/16/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-14	6/16/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-15	6/14/2022	Y	Y	Y	N	Y	--	N	Y	Y	--	--
MW-19	6/17/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-20-070	4/14/2022	Y	--	Y	N	Y	N	Y	Y	Y	Y	Water level below well riser.
MW-20-070	5/20/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-20-070	6/13/2022	Y	--	Y	N	Y	Y	N	Y	Y	Y	Tab stripped and needs retap
MW-20-100	4/14/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-20-100	5/20/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-20-100	6/13/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-20-130	4/14/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-20-130	5/20/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-20-130	6/13/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-21	4/12/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-21	5/18/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-21	6/14/2022	Y	--	Y	N	Y	Y	N	Y	Y	Y	Tabs stripped and need retap
MW-22	5/5/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-23-060	6/9/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-23-080	6/9/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-24A	6/16/2022	Y	Y	Y	N	Y	--	N	Y	Y	--	--
MW-24B	6/16/2022	Y	Y	Y	N	Y	--	N	Y	Y	--	--
MW-24BR	6/16/2022	Y	Y	Y	N	Y	--	N	Y	Y	--	--
MW-25	6/14/2022	Y	Y	Y	N	Y	--	N	Y	Y	--	--
MW-26	4/13/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-26	5/20/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-26	6/14/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-27-020	5/5/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-27-060	5/5/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-27-085	5/5/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-28-025	5/4/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-28-090	5/4/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-29	6/13/2022	Y	--	Y	N	Y	--	N	Y	Y	--	--
MW-30-030	5/3/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-30-050	5/3/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--

Table 4.1

## Monitoring Well Inspection Results

## Second Quarter 2022 Well Performance Report

Pacific Gas and Electric Company, Topock Compressor Station, Needles, California

Well ID	Date	Well Labeled On Casing Or Pad	Traffic Poles Intact	Concrete Pad Intact?	Erosion Around Wellhead?	Steel Casing Or Well Box Intact?	Any Tabs Stripped Or Missing?	Water In Well Box?	J Plug Replaced Properly?	Well Locked At Arrival?	All Bolts Present?	Comments
MW-30-050	6/17/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-31-060	4/12/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-31-060	5/20/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-31-060	6/13/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-31-135	4/12/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-31-135	5/20/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-31-135	6/13/2022	Y	--	Y	N	Y	Y	N	Y	Y	Y	Tab stripped and need retap.
MW-32-020	5/4/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-32-035	5/4/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-33-040	6/9/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-33-090	6/9/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-33-150	6/9/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-33-210	6/9/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-34-055	5/5/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-34-080	5/5/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-34-080	6/17/2022	Y	--	Y	N	Y	--	N	Y	Y	--	--
MW-34-100	5/5/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-35-060	6/7/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-35-135	6/7/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-36-020	5/4/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-36-040	5/4/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-36-050	5/4/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-36-070	5/4/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-36-090	5/4/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-36-090	6/17/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-36-100	5/4/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-36-100	6/17/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-37D	6/16/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-37S	6/16/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-38D	6/8/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-38S	6/8/2022	Y	--	Y	N	N	N	N	Y	Y	Y	Monitoring well has a slanted stand pipe and a bend in casing that requires 3/4" bladder pump. Damage to the well box was due to the March 2022 storm event and was repaired in July 2022.
MW-39-040	5/3/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-39-040	6/15/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-39-050	5/3/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-39-050	6/15/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-39-060	5/3/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-39-060	6/15/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-39-070	5/3/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-39-070	6/15/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-39-080	5/3/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-39-080	6/15/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-39-100	5/3/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-39-100	6/15/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-40D	6/16/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-40S	6/16/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-41D	6/16/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-41M	6/16/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-41S	6/16/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-42-030	5/5/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-42-055	5/5/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--

Table 4.1

## Monitoring Well Inspection Results

## Second Quarter 2022 Well Performance Report

Pacific Gas and Electric Company, Topock Compressor Station, Needles, California

Well ID	Date	Well Labeled On Casing Or Pad	Traffic Poles Intact	Concrete Pad Intact?	Erosion Around Wellhead?	Steel Casing Or Well Box Intact?	Any Tabs Stripped Or Missing?	Water In Well Box?	J Plug Replaced Properly?	Well Locked At Arrival?	All Bolts Present?	Comments
MW-42-065	5/5/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-43-025	5/3/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-43-075	5/3/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-43-090	5/3/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-44-070	5/6/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-44-115	5/6/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-44-115	6/17/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-44-125	5/6/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-44-125	6/17/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-45-095a	5/4/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-45-095a	6/17/2022	Y	--	Y	N	Y	--	N	Y	Y	--	--
MW-46-175	5/5/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-46-205	5/5/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-47-055	6/7/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-47-115	6/7/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-48	6/8/2022	Y	Y	Y	N	Y	N	N	Y	Y	Y	--
MW-49-135	6/13/2022	Y	--	Y	N	Y	--	N	Y	Y	--	--
MW-49-275	6/13/2022	Y	--	Y	N	Y	--	N	Y	Y	--	--
MW-49-365	6/13/2022	Y	--	Y	N	Y	--	N	Y	Y	--	--
MW-50-095	6/17/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-50-200	6/17/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-51	4/13/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-51	5/20/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-51	6/14/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-52D	5/3/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-52M	5/3/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-52S	5/3/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-53D	5/3/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-53M	5/3/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-53S	5/3/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-54-085	6/15/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-54-140	6/15/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-54-195	6/15/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-55-045	6/14/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-55-120	6/14/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-56D	6/14/2022	Y	Y	Y	N	Y	N	N	Y	Y	Y	--
MW-56M	6/14/2022	Y	Y	Y	N	Y	N	N	Y	Y	Y	--
MW-56S	6/14/2022	Y	Y	Y	N	Y	N	N	Y	Y	Y	--
MW-57-050	6/7/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-57-070	6/7/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-57-185	6/7/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-58-065	6/21/2022	Y	--	Y	N	Y	--	N	Y	Y	--	--
MW-58BR	6/21/2022	Y	--	Y	N	Y	--	N	Y	Y	--	--
MW-59-100	6/9/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-60-125	6/16/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-60BR-245	6/16/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-61-110	6/16/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-62-065	6/9/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-62-110	6/21/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-62-190	6/21/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-63-065	6/9/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-64BR	6/22/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-65-160	6/21/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--

Table 4.1

## Monitoring Well Inspection Results

## Second Quarter 2022 Well Performance Report

Pacific Gas and Electric Company, Topock Compressor Station, Needles, California

Well ID	Date	Well Labeled On Casing Or Pad	Traffic Poles Intact	Concrete Pad Intact?	Erosion Around Wellhead?	Steel Casing Or Well Box Intact?	Any Tabs Stripped Or Missing?	Water In Well Box?	J Plug Replaced Properly?	Well Locked At Arrival?	All Bolts Present?	Comments
MW-65-225	6/21/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-66-165	6/6/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-66-230	6/6/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-66BR-270	6/6/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-67-185	5/20/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-67-185	6/22/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-67-225	6/21/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-67-260	6/21/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-68-180	4/14/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-68-180	5/20/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-68-180	6/14/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-68-240	6/14/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-68BR-280	6/14/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-69-195	6/20/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-70-105	6/21/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-70BR-225	6/21/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-70BR-287	6/21/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-71-035	4/12/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-71-035	5/18/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-71-035	6/15/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-72-080	6/17/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-72BR-200	6/17/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-73-080	6/17/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-74-240	6/20/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-75-033	6/7/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-75-117	6/7/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-75-202	6/7/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-75-267	6/7/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-75-337	6/7/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-76-039	4/11/2022	Y	Y	Y	N	Y	N	N	Y	Y	Y	--
MW-76-039	5/16/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-76-039	6/13/2022	Y	Y	Y	N	Y	N	N	Y	Y	Y	--
MW-76-156	4/11/2022	Y	Y	Y	N	Y	N	N	Y	Y	Y	--
MW-76-156	5/16/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-76-156	6/13/2022	Y	Y	Y	N	Y	N	N	Y	Y	Y	--
MW-76-181	4/11/2022	Y	Y	Y	N	Y	N	N	Y	Y	Y	--
MW-76-181	5/16/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-76-181	6/13/2022	Y	Y	Y	N	Y	N	N	Y	Y	Y	--
MW-76-218	4/11/2022	Y	Y	Y	N	Y	N	N	Y	Y	Y	--
MW-76-218	5/16/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-76-218	6/13/2022	Y	Y	Y	N	Y	N	N	Y	Y	Y	--
MW-77-046	5/2/2022	Y	Y	Y	N	Y	N	N	Y	Y	Y	--
MW-77-046	6/15/2022	Y	Y	Y	N	Y	N	N	Y	Y	Y	--
MW-77-102	5/2/2022	Y	Y	Y	N	Y	N	N	Y	Y	Y	--
MW-77-102	6/15/2022	Y	Y	Y	N	Y	N	N	Y	Y	Y	--
MW-77-158	5/2/2022	Y	Y	Y	N	Y	N	N	Y	Y	Y	--
MW-77-158	6/15/2022	Y	Y	Y	N	Y	N	N	Y	Y	Y	--
MW-77-187	5/2/2022	Y	Y	Y	N	Y	N	N	Y	Y	Y	--
MW-77-187	6/15/2022	Y	Y	Y	N	Y	N	N	Y	Y	Y	--
MW-78-070	4/13/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-78-070	5/19/2022	Y	--	Y	N	Y	Y	N	Y	Y	Y	Tab stripped. Repaired for June event.
MW-78-070	6/14/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-78-142	4/13/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--

Table 4.1

## Monitoring Well Inspection Results

## Second Quarter 2022 Well Performance Report

Pacific Gas and Electric Company, Topock Compressor Station, Needles, California

Well ID	Date	Well Labeled On Casing Or Pad	Traffic Poles Intact	Concrete Pad Intact?	Erosion Around Wellhead?	Steel Casing Or Well Box Intact?	Any Tabs Stripped Or Missing?	Water In Well Box?	J Plug Replaced Properly?	Well Locked At Arrival?	All Bolts Present?	Comments
MW-78-142	5/19/2022	Y	--	Y	N	Y	Y	N	Y	Y	Y	Tab stripped. Repaired for June event.
MW-78-142	6/14/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-79-058	4/13/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-79-058	5/19/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-79-058	6/14/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-79-102	4/13/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-79-102	5/19/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-79-102	6/14/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-80-057	4/12/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-80-057	5/18/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-80-057	6/14/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-80-082	4/12/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-80-082	5/18/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-80-082	6/14/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-81-043	5/6/2022	Y	Y	Y	N	Y	N	N	Y	Y	Y	--
MW-81-043	6/16/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-81-098	5/6/2022	Y	Y	Y	N	Y	N	N	Y	Y	Y	--
MW-81-098	6/16/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-82-046	5/2/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-82-046	6/16/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-82-112	5/2/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-82-112	6/16/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-82-168	5/2/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-82-168	6/16/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-82-198	5/2/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-82-198	6/16/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-83-090	6/22/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-83-180	6/22/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-83-225	6/22/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-83-245	6/22/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-84-057	6/6/2022	Y	--	Y	N	Y	N	Y	Y	Y	Y	Water level below well riser.
MW-84-095	6/6/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-84-132	6/6/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-84-193	6/6/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-85-129	6/10/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-85-217	6/10/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-85-237	6/10/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-86-030	5/4/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-86-066	5/4/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-86-120	5/4/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-86-140	5/4/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-87-109	6/8/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-87-139	6/8/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-87-192	6/8/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-87-275	6/8/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-88-107	6/8/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-89-183	6/16/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-89-273	6/16/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-90-031	5/5/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-91-045	6/15/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-91-120	6/15/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-91-170	6/15/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-91-320	6/15/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--

Table 4.1

## Monitoring Well Inspection Results

## Second Quarter 2022 Well Performance Report

Pacific Gas and Electric Company, Topock Compressor Station, Needles, California

Well ID	Date	Well Labeled On Casing Or Pad	Traffic Poles Intact	Concrete Pad Intact?	Erosion Around Wellhead?	Steel Casing Or Well Box Intact?	Any Tabs Stripped Or Missing?	Water In Well Box?	J Plug Replaced Properly?	Well Locked At Arrival?	All Bolts Present?	Comments
MW-92-037	6/15/2022	Y	--	Y	N	Y	--	N	Y	Y	--	--
MW-92-072	6/15/2022	Y	--	Y	N	Y	--	N	Y	Y	--	--
MW-92-102	6/15/2022	Y	--	Y	N	Y	--	N	Y	Y	--	--
MW-92-122	6/15/2022	Y	--	Y	N	Y	--	N	Y	Y	--	--
MW-93-050	6/23/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-93-213	6/23/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-94-030	5/17/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-94-100	5/17/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-94-175	5/17/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-95-113	6/22/2022	Y	--	Y	N	Y	--	N	Y	Y	--	--
MW-95-157	6/22/2022	Y	--	Y	N	Y	--	N	Y	Y	--	--
MW-96-045	6/9/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-96-217	6/9/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-97-042	6/7/2022	Y	Y	Y	N	Y	N	N	Y	Y	Y	--
MW-97-202	6/7/2022	Y	Y	Y	N	Y	N	N	Y	Y	Y	--
MW-98-055	6/9/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-98-077	6/9/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-99-060	5/19/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
MW-99-140	5/19/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
PGE-08	6/10/2022	Y	Y	Y	N	Y	N	N	Y	Y	Y	--
PGE-09N	5/19/2022	Y	--	Y	N	Y	--	N	Y	Y	--	--
PGE-09S	5/19/2022	Y	--	Y	N	Y	--	N	Y	Y	--	--
PT5D	5/5/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
PT5M	5/5/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
PT5S	5/5/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
PT8D	6/23/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
PT9D	6/23/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
PT9M	6/23/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
PT9S	6/23/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
Site B-165	5/18/2022	Y	--	Y	N	Y	--	N	Y	Y	--	--
Site B-220	5/18/2022	Y	--	Y	N	Y	--	N	Y	Y	--	--
Site B-285	5/18/2022	Y	--	Y	N	Y	--	N	Y	Y	--	--
Topock-2	5/18/2022	Y	--	Y	N	Y	--	N	Y	Y	--	--
Topock-3	5/18/2022	Y	--	Y	N	Y	--	N	Y	Y	--	--
TW-02D	4/14/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
TW-02D	5/19/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
TW-02D	6/15/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
TW-02S	4/14/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
TW-02S	5/19/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
TW-02S	6/15/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
TW-03D	4/14/2022	Y	--	Y	N	Y	N	Y	Y	Y	Y	1" water in vault floor
TW-03D	5/19/2022	Y	--	Y	N	Y	N	N	Y	--	Y	--
TW-03D	6/15/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
TW-04	6/7/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--
TW-05	6/17/2022	Y	--	Y	N	Y	N	N	Y	Y	Y	--

## Abbreviation:

-- = Not applicable

N = No

Y = Yes











**Table 4.2**  
**Monitoring Well Water Levels and Specific Capacities**  
**Second Quarter 2022 Well Performance Report**  
**Pacific Gas and Electric Company, Topock Compressor Station, Needles, California**

Well ID	Well Screen Lithology	Sample Date	Constructed Well Depth (feet bTOC)	Measured Well Depth (feet bTOC)	Difference in Constructed and Measured Well Depth (feet bTOC)	Screen Start Depth (feet bTOC)	Screen End Depth (feet bTOC)	Pre-Purge Depth to Water (feet bTOC)	Post-Purge Depth to Water (feet bTOC)	Drawdown During Purging (feet)	Purging Rate (ml/min)	Specific Capacity (gpm/feet)	Measured Depth Covering Greater than 20% of screen?	Flagged for Additional Evaluation
TW-02D	Alluvial	06/15/2022	146.50	149.61	-3.11	109.50	144.50	30.74	30.74	0.00	3,785	--	No	X
TW-02S	Alluvial	04/14/2022	100.14	96.27	3.87	45.14	95.14	37.32	37.35	0.03	3,785	33.33	No	
TW-02S	Alluvial	05/19/2022	100.14	96.27	3.87	45.14	95.14	36.51	36.55	0.04	3,785	25.00	No	
TW-02S	Alluvial	06/15/2022	100.14	96.27	3.87	45.14	95.14	37.07	37.07	0.00	3,785	--	No	
TW-03D	Alluvial	04/14/2022	N/A	152.32	N/A	N/A	N/A	37.13	36.76	-0.37	3,785	2.70	N/A	X
TW-03D	Alluvial	05/19/2022	N/A	156.00	N/A	N/A	N/A	35.61	35.68	0.07	3,785	14.28	N/A	X
TW-03D	Alluvial	06/15/2022	N/A	152.32	N/A	N/A	N/A	36.3	36.3	0.00	3,785	--	N/A	X
TW-04	Alluvial	06/07/2022	256.49	253.96	2.53	211.49	251.49	28.73	28.93	0.20	500	0.66	No	
TW-05	Alluvial	06/17/2022	156.33	155.70	0.63	111.33	151.33	40	40.04	0.04	500	3.30	No	

**Notes and Abbreviations:**

1. Slant wells (MW-52D, MW-52M, MW-52S, MW-53D, MW-53M, and MW-53S) are not included in this evaluation.
2. Specific capacity is evaluated for alluvial and fluvial wells. Bedrock wells are not included in this evaluation.
3. Monitoring wells MW-20-70, MW-20-100, MW-20-130, MW-22, MW-22, MW-38-D, and MW-38-S were resurveyed on July 25, 2022 due to observed discrepancies between constructed and measured well depths.

N/A = Not Applicable

-- = No drawdown during purging.

# **Figures**



#### LEGEND

- ◆ REMEDIATION WELL (EXTRACTION)
- REMEDIATION WELL (INJECTION)
- ◇ REMEDIATION WELL (NOT PLUMBED INTO SYSTEM CURRENTLY)
- BAT CAVE WASH
- PIPELINE
- REMEDY STRUCTURE

**Notes:**

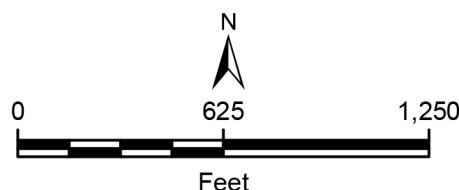
1. NTH = National Trails Highway
2. IRZ = In Situ Reactive Zone

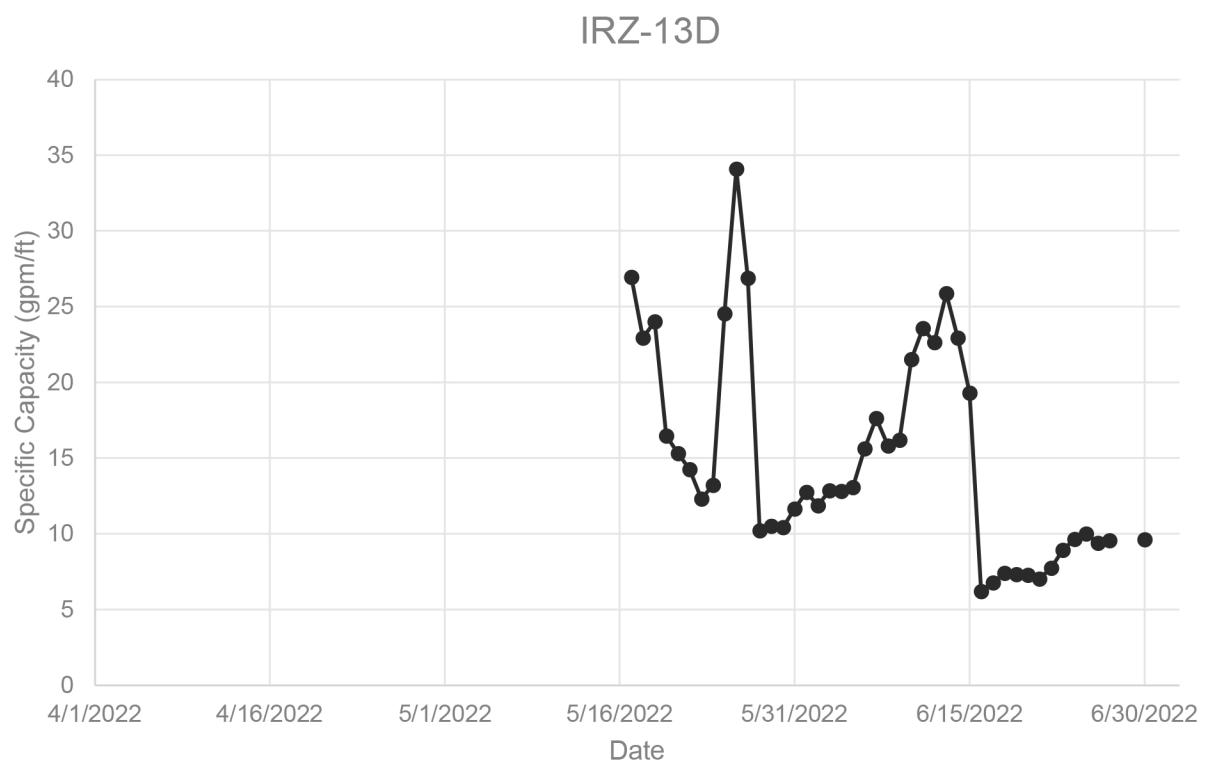
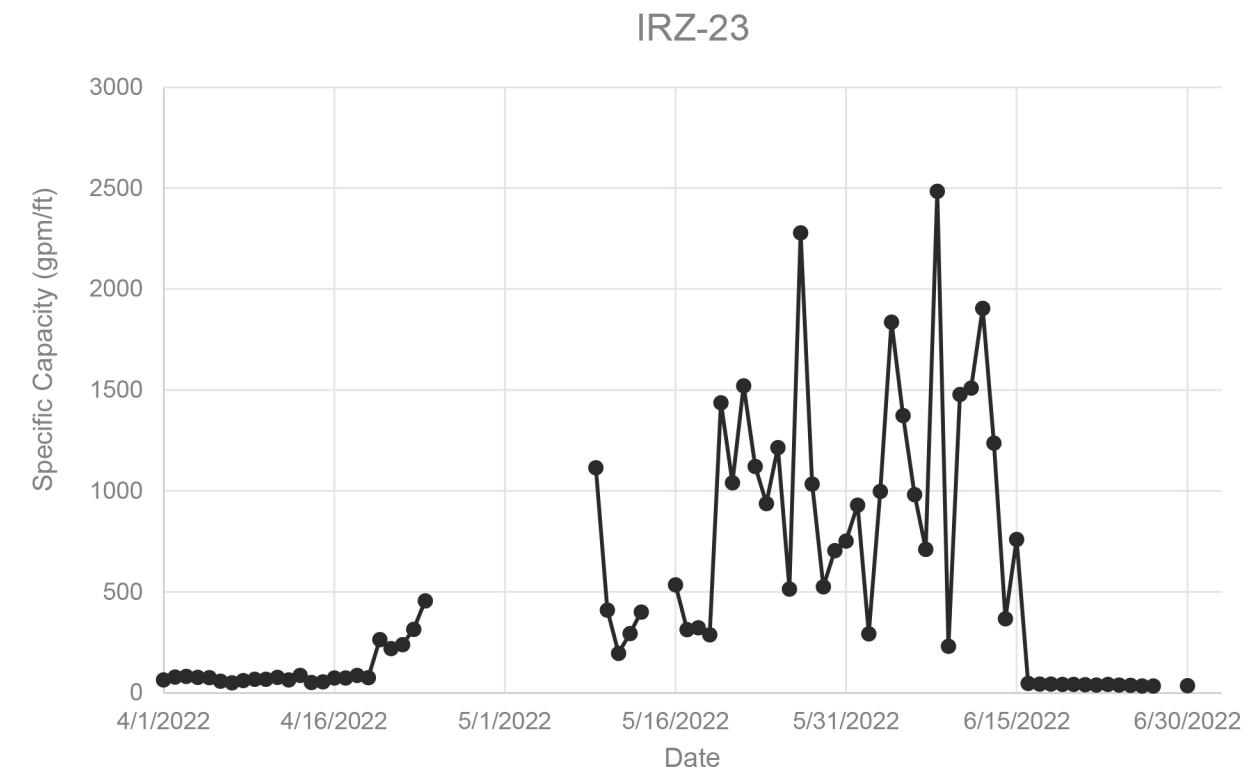
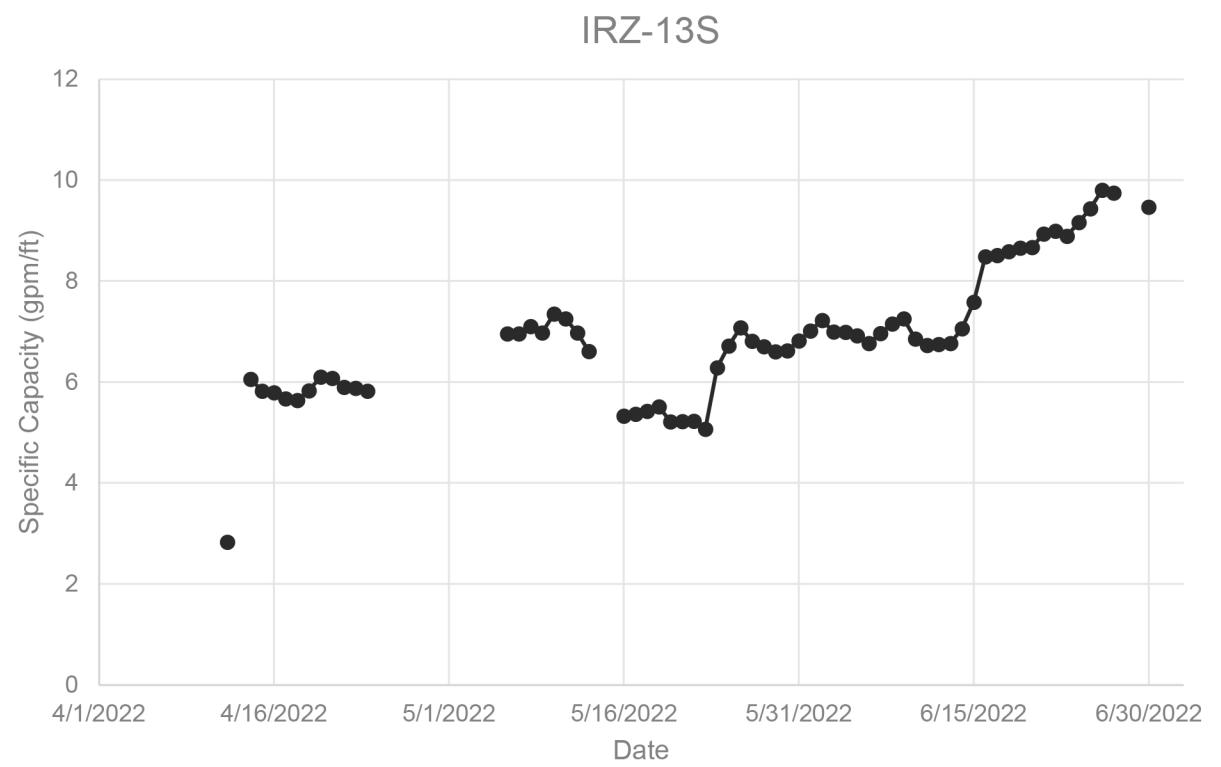
**SECOND QUARTER 2022  
WELL PERFORMANCE REPORT  
PG&E TOPOCK COMPRESSOR STATION  
NEEDLES, CALIFORNIA**

#### PARTIAL REMEDY SYSTEM LAYOUT

**ARCADIS**

**FIGURE  
1.1**

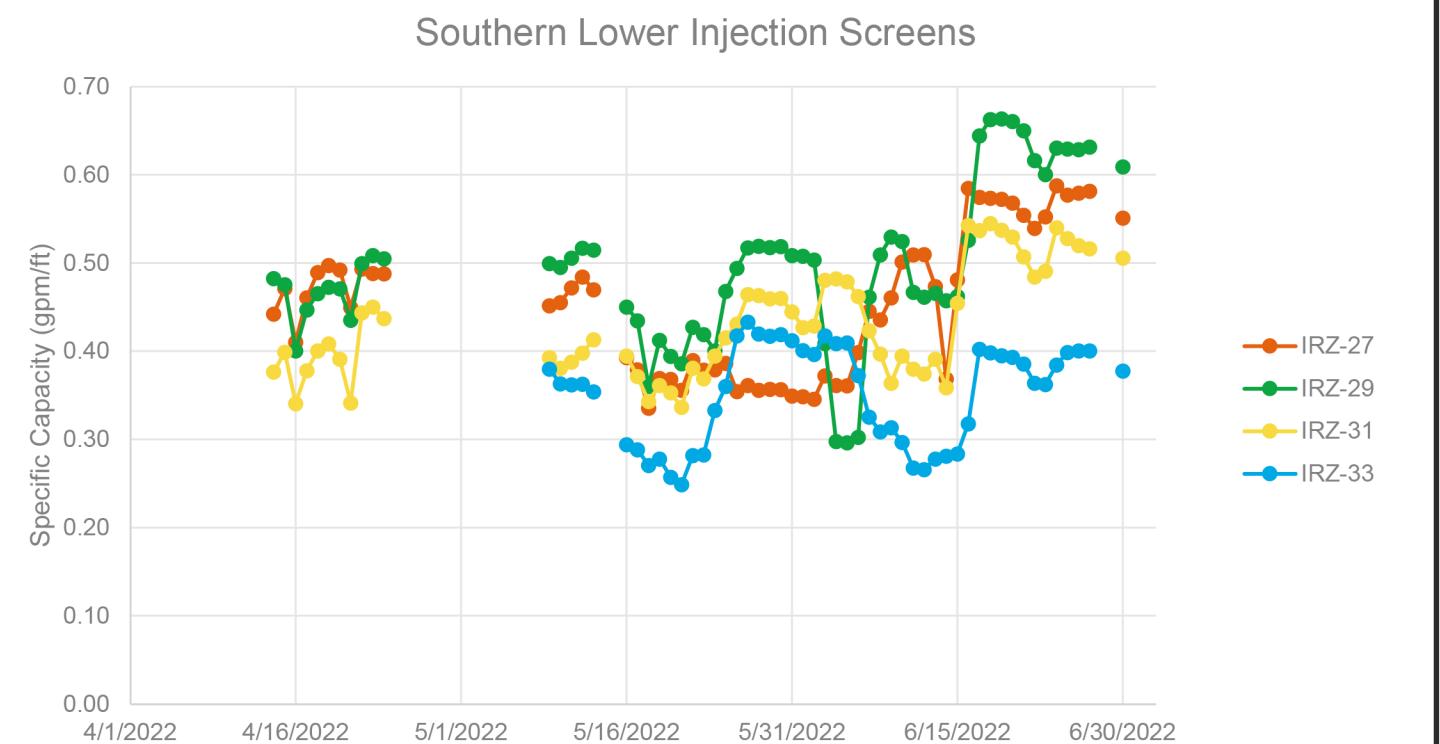
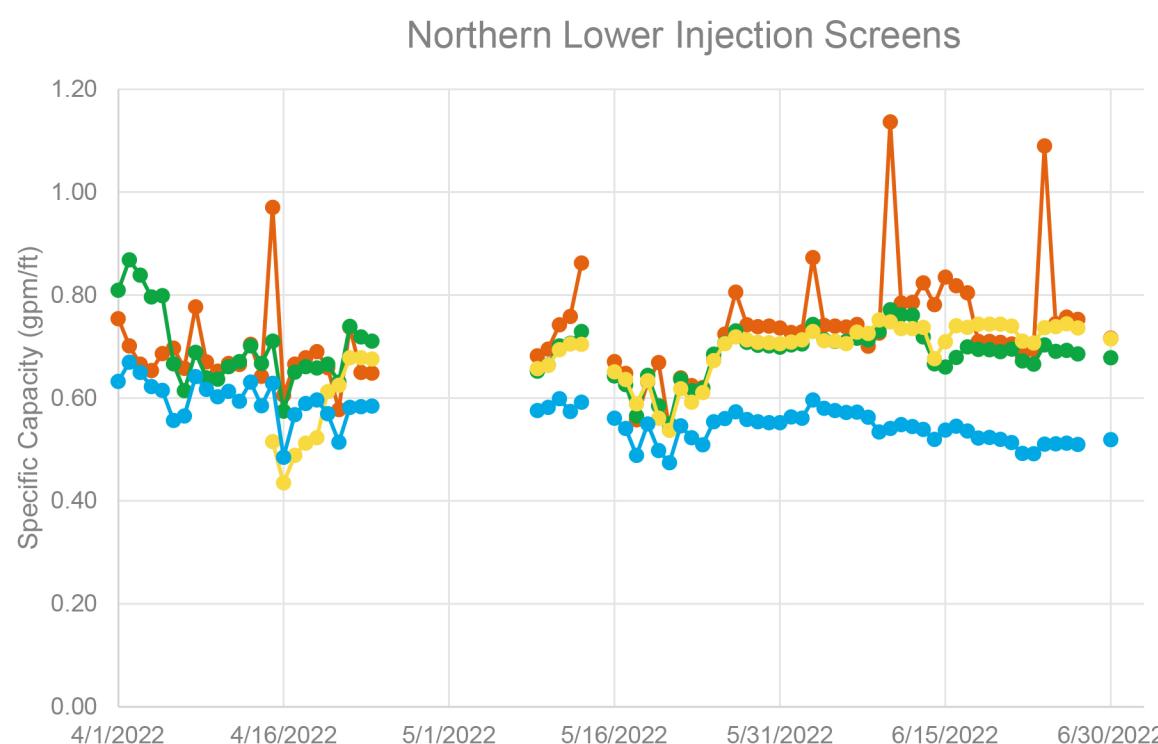
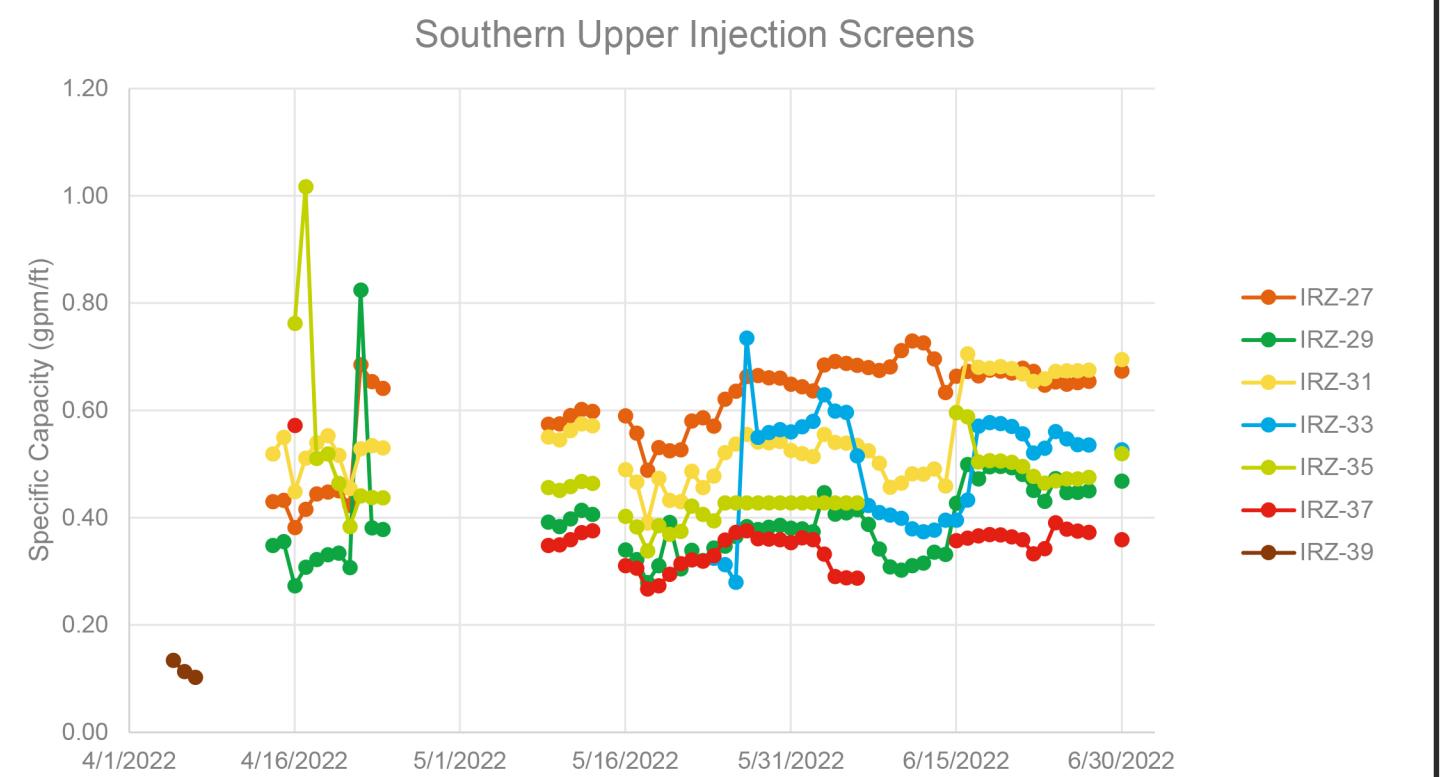
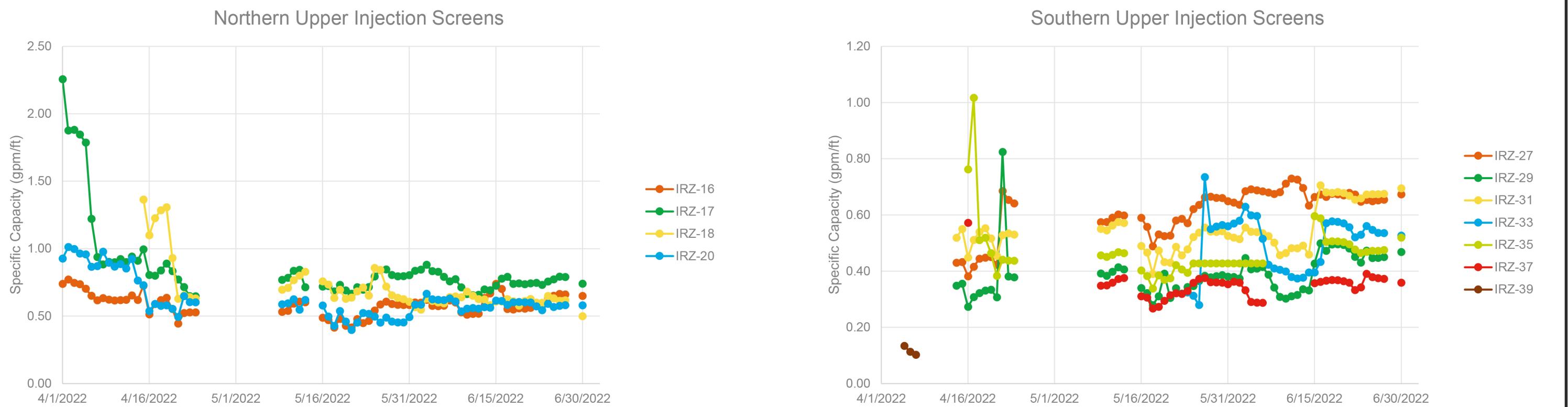




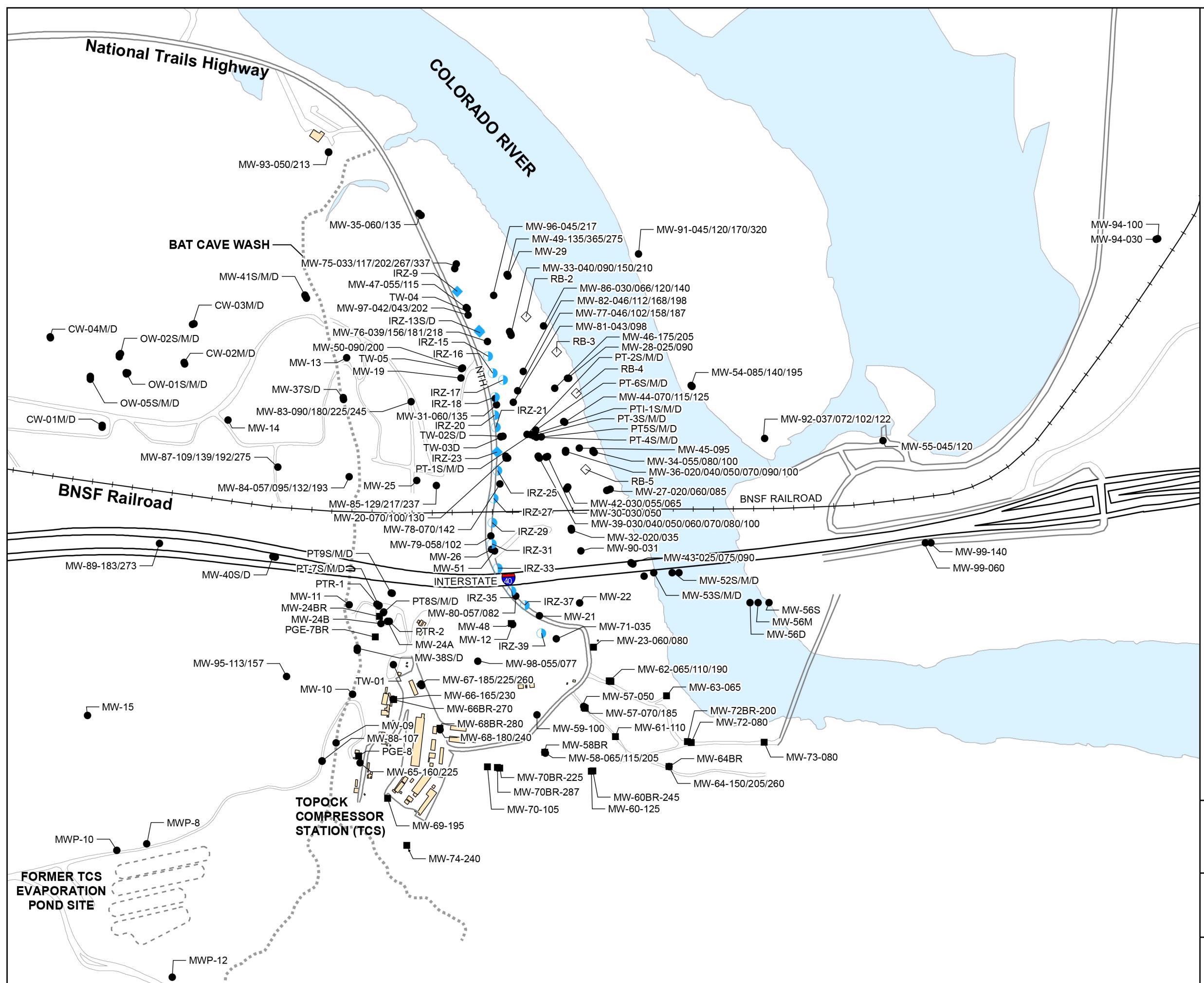
**Note:**  
1. gpm/ft = gallon per minute per foot of drawdown

SECOND QUARTER 2022  
WELL PERFORMANCE REPORT  
PG&E TOPOCK COMPRESSOR STATION  
NEEDLES, CALIFORNIA

**EXTRACTION WELL SPECIFIC  
CAPACITY TRENDS**



**Note:**  
1. gpm/ft = gallon per minute per foot of drawup



**LEGEND**

- GROUNDWATER MONITORING WELL
- REMEDIATION WELL (INJECTION)
- ◆ REMEDIATION WELL (EXTRACTION)
- ◇ REMEDIATION WELL (NOT PLUMBED INTO SYSTEM CURRENTLY)
- BEDROCK WELL
- BAT CAVE WASH

SECOND QUARTER 2022  
WELL PERFORMANCE REPORT  
PG&E TOPOCK COMPRESSOR STATION  
NEEDLES, CALIFORNIA

## MONITORING WELL NETWORK

Arcadis U.S., Inc.  
100 Montgomery Street  
Suite 300  
San Francisco  
California 94104  
Phone: 415 374 2744  
Fax: 415 374 2745  
[www.arcadis.com](http://www.arcadis.com)