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July 13, 2018

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Scot Stormo  
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Colorado River Basin Region  
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**Subject: Topock IM-3 Combined Second Quarter 2018 Monitoring, Semiannual January – June 2018  
Operation and Maintenance Report  
PG&E Topock Compressor Station, Needles, California  
Interim Measure No. 3 Groundwater Treatment System  
(Document ID: PGE20180713A)**

Dear Ms. Innis and Mr. Stormo:

Enclosed is the Second Quarter 2018 Monitoring, Semiannual January – June 2018 Operation and Maintenance Report for the Pacific Gas and Electric Company (PG&E) Topock Compressor Station, Interim Measure No. 3 (IM-3) Groundwater Treatment System.

From July 2005 through September 2011 PG&E was operating the IM-3 groundwater treatment system as authorized by the Colorado River Basin Regional Water Quality Control Board (Regional Water Board) Order No. R7-2004-0103 (issued October 13, 2004); Order No. R7-2006-0060 (issued September 20, 2006); and the revised Monitoring and Reporting Program under Order No. R7-2006-0060 (issued August 28, 2008). Order No. R7-2006-0060 expired on September 20, 2011.

PG&E is currently operating the IM-3 groundwater treatment system as authorized by the U.S. Department of the Interior (DOI) Waste Discharge Applicable or Relevant and Appropriate Requirements (ARARs) as documented in Attachment A to the Letter Agreement issued July 26, 2011 from the Regional Water Board to DOI, and the subsequent Letter of Concurrence issued August 18, 2011 from DOI to the Regional Water Board. Quarterly monitoring reports are required to be submitted by the fifteenth day of the month following the end of the quarter.

Sustainable remediation is a corporate commitment internally monitored by PG&E. IM-3 is operated in a manner that has resulted in sustainable reductions in electrical use, greenhouse gas (GHG) emissions, and generation of solid and liquid waste. Examples include: (1) reduced electricity use and associated GHG emissions due to use of photocells to manage outdoor lighting at IM-3 and use of solar power for the injection area wellhead data collection system; (2) process optimization initiatives (within

Pamela S. Innis  
Scot Stormo  
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constraints of the injection permit) have reduced brine production, treatment sludge production, and treatment chemical use, and (3) these efforts also reduce the fuel consumption and GHG emissions from chemical deliveries and waste disposal.

The IM-3 groundwater extraction and treatment system has extracted and treated approximately 859,646,309 gallons of water and removed approximately 7,430 pounds of total chromium from August 1, 2005 through June 30, 2018.

The groundwater monitoring results for wells OW-1S/M/D, OW-2S/M/D, OW-5S/M/D, CW-1M/D, CW-2M/D, CW-3M/D, and CW-4M/D will be submitted under separate cover as part of the Compliance Monitoring Program.

If you have any questions regarding this report, please call me at (760) 326-5582.

Sincerely,

A handwritten signature in blue ink, appearing to read "Curt Russell", is positioned above the printed name.

Curt Russell  
Topock Site Manager

Enclosures:

Topock IM-3 Combined Second Quarter 2018 Monitoring, Semiannual January – June 2018 Operation and Maintenance Report

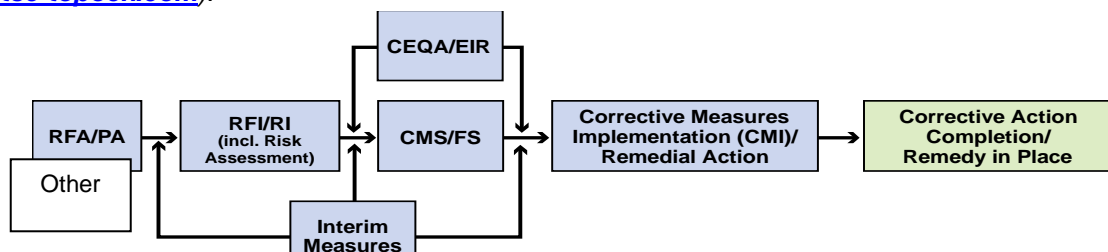
cc: Aaron Yue, California Department of Toxic Substances Control

## Topock Project Executive Abstract

<p>Document Title:  Topock IM-3 Second Quarter 2018 Monitoring, Semiannual January - June 2018 Operation and Maintenance Report  Submitting Agency/Author: U.S. Department of the Interior and Regional Water Quality Control Board  Final Document? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>	<p>Date of Document: July 13, 2018  Who Created this Document?: (i.e. PG&amp;E, DTSC, DOI, Other)  PG&amp;E  Document ID Number:  PGE20180713A</p>
<p>Priority Status: <input type="checkbox"/> HIGH <input type="checkbox"/> MED <input checked="" type="checkbox"/> LOW  Is this time critical? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p>	<p>Action Required:  <input checked="" type="checkbox"/> Information Only <input type="checkbox"/> Review &amp; Comment  Return to: _____   By Date: _____  <input type="checkbox"/> Other / Explain:</p>
<p>Type of Document:  <input type="checkbox"/> Draft <input checked="" type="checkbox"/> Report <input type="checkbox"/> Letter <input type="checkbox"/> Memo  <input type="checkbox"/> Other / Explain:</p>	
<p>What does this information pertain to?  <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 type="checkbox"/> Corrective Measures Implementation (CMI)/Remedial Action  <input type="checkbox"/> California Environmental Quality Act (CEQA)/Environmental Impact Report (EIR)  <input checked="" type="checkbox"/> Interim Measures  <input type="checkbox"/> Other / Explain:</p>	<p>Is this a Regulatory Requirement?  <input checked="" type="checkbox"/> Yes  <input type="checkbox"/> No  If no, why is the document needed?</p>
<p>What is the consequence of NOT doing this item? What is the consequence of DOING this item?   Submittal of this report is a compliance requirement of the Applicable or Relevant and Appropriate Requirements (ARARs) for waste discharge as documented in Attachment A to the Letter Agreement issued July 26, 2011.</p>	<p>Other Justification/s:  <input type="checkbox"/> Permit <input type="checkbox"/> Other / Explain:</p>
<p>Brief Summary of attached document:</p> <p>This report covers the Interim Measures No. 3 (IM-3) groundwater treatment system monitoring activities during the Second Quarter 2018 period, and the operation and maintenance activities during the January 1, 2018 to June 30, 2018 semiannual period. The groundwater monitoring results for wells OW-1S/M/D, OW-2S/M/D, OW-5S/M/D, CW-1M/D, CW-2M/D, CW-3M/D, and CW-4M/D will be submitted under separate cover as part of the Compliance Monitoring Program.</p> <p>Written by: PG&amp;E</p>	
<p>Recommendations:  This report is for your information only.</p>	
<p>How is this information related to the Final Remedy or Regulatory Requirements?</p> <p>The Topock IM-3 Second Quarter 2018 Monitoring, Semiannual January - June 2018 Operation and Maintenance Report is related to the Interim Measure. PG&amp;E is currently operating the IM-3 groundwater treatment system as authorized by the U.S. Department of the Interior (DOI) Waste Discharge ARARs as documented in Attachment A to the Letter Agreement issued July 26, 2011 from the Colorado River Basin Regional Water Quality Control Board (Regional Water Board) to DOI, and the subsequent Letter of Concurrence issued August 18, 2011 from DOI to the Regional Water Board.</p>	
<p>Other requirements of this information?  None.</p>	

Related Reports and Documents:

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



Legend

RFA/PA – RCRA Facility Assessment/Preliminary Assessment

RFI/RI – RCRA Facility Investigation/CERCLA Remedial Investigation (including Risk Assessment)

CMS/FS – RCRA Corrective Measure Study/CERCLA Feasibility Study

Version 9



Combined Second Quarter 2018 Monitoring,  
Semiannual January – June 2018  
Operation and Maintenance Report  
Interim Measure No. 3 Groundwater  
Treatment System

Document ID: PGE20180713A

PG&E Topock Compressor Station  
Needles, California

*Prepared for*

Colorado River Basin Regional Water Quality Control Board  
and  
United States Department of the Interior

*on behalf of*

Pacific Gas and Electric Company

July 13, 2018



155 Grand Avenue, Suite 800  
Oakland, CA 94612

Combined Second Quarter 2018 Monitoring, Semiannual January - June 2018  
Operation and Maintenance Report  
for Interim Measure No. 3 Groundwater Treatment System

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July 13, 2018

This report was prepared under the supervision of a  
California Certified Professional Engineer



Dennis Fink, P.E.  
Project Engineer



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- A Semiannual Operations and Maintenance Log, January 1, 2018 through June 30, 2018
- B Daily Volumes of Groundwater Treated
- C Flowmeter Calibration Records
- D Second Quarter 2018 Laboratory Analytical Reports

# Acronyms and Abbreviations

ARARs	Applicable or Relevant and Appropriate Requirements
ASSET	ASSET Laboratories
DOI	United States Department of the Interior
gpm	gallons per minute
IM	Interim Measure
IM-3	Interim Measure No. 3
IW	injection well
MRP	Monitoring and Reporting Program
PG&E	Pacific Gas and Electric Company
PST	Pacific Standard Time
RCRA	Resource Conservations and Recovery Act
Regional Water Board	Colorado River Basin Regional Water Quality Control Board
RO	reverse osmosis
Truesdail	Truesdail Laboratories, Inc.
WDR	Waste Discharge Requirements

# Introduction

Pacific Gas and Electric Company (PG&E) is implementing an Interim Measure (IM) to address chromium concentrations in groundwater at the Topock Compressor Station near Needles, California. The IM consists of groundwater extraction for hydraulic control of the plume boundaries in the Colorado River floodplain, treatment of extracted groundwater, and treated groundwater injection into injection wells located on San Bernardino County Assessor's Parcel No. 650-151-06. The groundwater extraction, treatment, and injection systems collectively are referred to as Interim Measure No. 3 (IM-3). Figure 1 provides a map of the project area. All figures are located at the end of this report.

From July 2005 through September 2011 PG&E was operating the IM-3 groundwater treatment system as authorized by the Colorado River Basin Regional Water Quality Control Board (Regional Water Board) Order No. R7-2004-0103 (issued October 13, 2004), Order No. R7-2006-0060 (issued September 20, 2006), and the revised Monitoring and Reporting Program (MRP) under Order No. R7-2006-0060 (issued August 28, 2008). Order No. R7-2006-0060 expired September 20, 2011.

PG&E is currently operating the IM-3 groundwater treatment system as authorized by the U.S. Department of the Interior (DOI) Waste Discharge Applicable or Relevant and Appropriate Requirements (ARARs) as documented in Attachment A to the Letter Agreement issued July 26, 2011 from the Regional Water Board to DOI, and the subsequent Letter of Concurrence issued August 18, 2011 from DOI to the Regional Water Board. Quarterly monitoring reports are required to be submitted by the fifteenth day of the month following the end of the quarter.

**This report covers monitoring activities related to operation of the IM-3 groundwater treatment system during the Second Quarter 2018 and the operation and maintenance activities during the January 1, 2018 to June 30, 2018 semiannual period.** The groundwater monitoring results for wells OW-1S/M/D, OW-2S/M/D, OW-5S/M/D, CW-1M/D, CW-2M/D, CW-3M/D, and CW-4M/D will be submitted under separate cover, as part of the Compliance Monitoring Program.

# Sampling Station Locations

Table 1 lists the locations of sampling stations. (All tables are located at the end of this report.) Sampling station locations are shown on the process and instrumentation diagrams (Figures TP-PR-10-10-04, PR-10-03, PR-10-04, and TP-PR-10-10-06) provided at the end of this report.

# Description of Activities

This report describes Second Quarter 2018 monitoring activities and the January 1, 2018 through June 30, 2018 (First and Second Quarters) operation and maintenance activities related to the IM-3 groundwater treatment system. IM-3 monitoring activities from January 1, 2018 through March 31, 2018 (First Quarter) were presented in the First Quarter 2018 Monitoring Report for IM-3 submitted to the DOI and Regional Water Board April 14, 2018.

This report, therefore, serves as the Semiannual January – June 2018 Operation and Maintenance Report for IM-3.

## 3.1 Groundwater Treatment System

The treatment system was initially operated between July 25 and July 28, 2005 for the Waste Discharge Requirements (WDR)-mandated startup phase. Discharge to the injection wells was initiated July 31, 2005 after successfully completing the startup phase in accordance with Order R7-2004-0103. Full-time operation of the treatment system commenced in August 2005.

Influent to the treatment facility, as listed in Attachment A, Waste Discharge ARARs, to the Letter Agreement issued July 26, 2011, includes the following:

- Groundwater from extraction wells TW-2S, TW-2D, TW-3D, and PE-1
- Purged groundwater and water generated from rinsing field equipment during monitoring events
- Groundwater generated during well installation, well development, and aquifer testing

Operation of the groundwater treatment system results in the following three effluent streams:

- **Treated Effluent:** Treated water that is discharged to the injection well(s)
- **Reverse Osmosis (RO) Concentrate (brine):** Treatment byproduct that is transported and disposed of offsite at a permitted facility
- **Sludge:** Treatment byproduct that is transported offsite for disposal at a permitted facility, which occurs either when a sludge waste storage bin reaches capacity, or within 90 days of the start date for accumulation in the storage container, whichever occurs first

## 3.2 Groundwater Treatment System Flow Rates for Second Quarter 2018

Downtime is defined as any periods when all extraction wells are not operating so that no groundwater is being extracted and piped into IM-3 as influent. Periods of planned and unplanned extraction system downtime are summarized in the Semiannual Operations and Maintenance Log provided in Appendix A. The times shown are in Pacific Standard Time to be consistent with other data collected (e.g., water level data) at the site. Periods of planned and unplanned extraction system downtime during the months January 2018 through March 2018 were originally reported in the First Quarter 2018 Monitoring Report for IM-3 submitted to the DOI and Regional Water Board on April 14, 2018, and are also included in Appendix A of this report.

Data regarding daily volumes of groundwater treated and discharged are provided in Appendix B. The IM-3 groundwater treatment system flowmeter calibration records are included in Appendix C.



### 3.2.1 Treatment System Influent

During the Second Quarter 2018, extraction wells TW-2D, TW-3D, and PE-1 operated with a target pumping rate of 135 gallons per minute (gpm), excluding periods of planned and unplanned downtime. Extraction well TW-2S was not operated during Second Quarter 2018. Extraction well TW-2D was operated for sample collection only during Second Quarter 2018. The operational run time for the IM groundwater extraction system (combined or individual pumping), by month, was approximately:

- 82.4 percent during April 2018
- 95.5 percent during May 2018
- 88.1 percent during June 2018

The Second Quarter 2018 treatment system monthly average flow rates (influent, effluent, and RO concentrate) are presented in Table 2. The system influent flow rate was measured by flowmeters at groundwater extraction wells TW-2S, TW-2D, TW-3D, and PE-1 (Figure TP-PR-10-10-03).

The IM-3 facility treated approximately 15,716,666 gallons of extracted groundwater during Second Quarter 2018.

In addition to extracted groundwater, during Second Quarter 2018 the IM-3 facility treated 2,020 gallons of water generated from the groundwater monitoring program and 1,030 gallons of injection well development water from Groundwater Partners.

### 3.2.2 Effluent Streams

The treatment system effluent flow rate was measured by flowmeters in the piping leading to injection wells IW-2 and IW-3 (Figure TP-PR-10-10-11) and in the piping running from the treated water tank T-700 to the injection wells (Figure TP-PR-10-10-04). The IM-3 facility injected 15,757,120 gallons of treatment system effluent during Second Quarter 2018. The monthly average flow rate to injection wells is shown in Table 2.

The RO concentrate flow rate was measured by a flowmeter at the piping carrying water from RO concentrate tank T-701 to the truck load-out station (Figure PR-10-04). The IM-3 facility generated 97,510 gallons of RO concentrate during Second Quarter 2018. The monthly average RO concentrate flow rate is shown in Table 2.

The sludge flow rate is measured by the size and weight of containers shipped offsite. Three sludge containers were shipped offsite from the IM-3 facility during Second Quarter 2018. The shipment dates and approximate weights are provided in Section 5.3.

## 3.3 Sampling and Analytical Procedures

With the exception of pH, all samples were collected at the designated sampling locations and placed directly into containers provided by ASSET Laboratories (ASSET) and Truesdail Laboratories, Inc. (Truesdail). Sample containers were labeled and packaged according to standard sampling procedures.

The samples were stored in a sealed container chilled with ice and transported to ASSET or Truesdail via courier under chain-of-custody documentation. The laboratories confirmed the samples were received in chilled condition upon arrival.

ASSET is certified by the California Department of Health Services (Certification No. 2676) under the State of California's Environmental Laboratory Accreditation Program. Truesdail is certified by the California Department of Health Services (Certification No. 1237) under the State of California's Environmental Laboratory Accreditation Program. California-certified laboratory analyses were performed in accordance with the latest edition of the *Guidelines Establishing Test Procedures for*

*Analysis of Pollutants* (40 Code of Federal Regulations Part 136), promulgated by the U.S. Environmental Protection Agency.

Analysis of pH was conducted by field method pursuant to the Regional Water Board letter dated October 16, 2007 (subject: Clarification of Monitoring and Reporting Program Requirements) authorizing pH measurements to be conducted in the field. The field method pH samples were collected at the designated sampling locations and field tested within 15 minutes of sampling.

As required by the MRP, the analytical method selected for total chromium has a method detection limit of 1 part per billion, and the analytical method selected for hexavalent chromium has a method detection limit of 0.2 part per billion.

Influent, effluent, RO concentrate, and sludge sampling frequency were in accordance with the MRP. The Second Quarter 2018 sample collection schedule is shown in Table 3.

Groundwater quality is being monitored in observation and compliance wells according to Attachment A, Waste Discharge ARARs, to the Letter Agreement issued July 26, 2011, and the procedures and schedules approved in the *Groundwater Compliance Monitoring Plan for Interim Measures No. 3 Injection Area* submitted to the Regional Water Board on June 17, 2005. Quarterly groundwater monitoring analytical results for the injection area (wells OW-1S/M/D, OW-2S/M/D, OW-5S/M/D, CW-1M/D, CW-2M/D, CW-3M/D, and CW-4M/D) are reported in a separate document, in conjunction with groundwater level maps of the same monitoring wells.

# Analytical Results

The analytical results and laboratory reports for the IM-3 groundwater treatment system monitoring program were previously reported for the First Quarter of 2018 in the First Quarter 2018 Monitoring Report submitted to the DOI and Regional Water Board on April 14, 2018.

Laboratory reports for samples collected in Second Quarter 2018 were prepared by certified analytical laboratories, and are presented in Appendix D. The Second Quarter 2018 analytical results are presented in Tables 4, 5, 6, and 7:

- Influent analytical results are presented in Table 4.
- Effluent analytical results are presented in Table 5. There were no exceedances of effluent limitations during the reporting period.
- RO concentrate analytical results are presented in Table 6.
- Sludge analytical results are presented in Table 7.

The sludge is required to have an aquatic bioassay test annually. The most recent aquatic bioassay test was conducted on a Third Quarter 2017 sample. The next sludge aquatic bioassay test is scheduled for the Third Quarter 2018 sampling event.

Table 8 identifies the following information for each analysis:

- Sample location
- Sample identification number
- Sampler name
- Sample date
- Sample time
- Laboratory performing analysis
- Analysis method
- Analysis date
- Laboratory technician

# Semiannual Operation and Maintenance

This section includes the Semiannual Operation and Maintenance Report for the IM-3 groundwater treatment system for the period January 1, 2018 through June 30, 2018.

All operation and maintenance records are maintained at the facility, including site inspection forms, process monitoring records, hazardous waste generator records (i.e., waste manifests), and self-monitoring reports. These records will be maintained onsite for a period of at least 5 years. Operational programmable logic controller data (flow rates, system alarms, process monitoring data, etc.) are maintained electronically via data historian software. Operation and maintenance records are also archived using maintenance software. The subsections below summarize the operation and maintenance activities during this semiannual reporting period.

## 5.1 Flowmeter Calibration Records

The IM-3 groundwater treatment system flowmeter calibration records are included in Appendix C. Flowmeter calibrations are performed in a timely manner consistent with the use, flow, material, and manufacturer recommendations. The following flowmeters are used at the facility to measure groundwater flow:

Location	Flowmeter Location ID	Current Flowmeter Serial No.	Date of Calibration	Date of Installation
Extraction well PE-1	FIT-103	6A021F16000	9/16/2015	1/6/2016
Extraction well TW-3D	FIT-102	6C037116000	9/17/2015	1/6/2016
Extraction well TW-2D	FIT-101	6C036F16000	1/15/2016	6/1/2016
Extraction well TW-2S	FIT-100	6A022116000	9/20/2013	7/8/2015
Injection well IW-03	FIT-1203	6C037316000	1/15/2016	3/1/2016
Injection well IW-02	FIT-1202	7700F216000	5/4/2017	8/8/2017
Combined IW-02 and IW-03	FIT-700	L200EO16000	2/5/2016	10/6/2016
Reverse osmosis concentrate	FIT-701	6C037216000	5/6/2016	8/8/2017

## 5.2 Volumes of Groundwater Treated

Data regarding daily volumes of groundwater treated between January 1, 2018 through June 30, 2018 are provided in Appendix B.

Approximately 32,708,538 gallons of groundwater were extracted and treated between January 1, 2018 and June 30, 2018. Treatment of this water at the IM-3 facility is being performed in accordance with the conditions of ARARs.

Additionally, approximately 2,395 gallons of well purge water (generated during well development, monitoring well sampling, and/or aquifer testing) and 19,930 gallons of injection well re-development water from Groundwater Partners were treated at the IM-3 facility during the January 1, 2018 through June 30, 2018 semiannual period.

A total of approximately 32,813,047 gallons of treated groundwater were injected back into the Alluvial Aquifer between January 1, 2018 and June 30, 2018.

### 5.3 Residual Solids Generated (Sludge)

During the January 1, 2018 through June 30, 2018 reporting period, eight containers of sludge were shipped offsite for disposal. The sludge was shipped to U.S. Ecology in Beatty, Nevada for disposal. A listing of each shipment during the reporting period is provided below.

Date Sludge Bin Removed from Site	Approximate Quantity from Waste Manifests (cubic yards)	Type of Shipment
3/2/2018	8	Non-RCRA hazardous waste
3/2/2018	8	Non-RCRA hazardous waste
3/26/2018	8	Non-RCRA hazardous waste
3/26/2018	8	Non-RCRA hazardous waste
3/27/2018	8	Non-RCRA hazardous waste
6/27/2018	8	Non-RCRA hazardous waste
6/28/2018	8	Non-RCRA hazardous waste
6/28/2018	8	Non-RCRA hazardous waste

**Note:**

RCRA = Resource Conservation and Recovery Act

### 5.4 Reverse Osmosis Concentrate Generated

Data regarding daily volumes of RO concentrate generated are provided in Appendix B, as measured by flowmeter FIT-701 (Figures PR-10-03 and PR-10-04). From January 1, 2018 through June 30, 2018, approximately 236,973 gallons of RO concentrate were transported to Liquid Environmental Solutions in Phoenix, Arizona for disposal.

### 5.5 Summary of ARARs Compliance

No ARAR violations were identified during the January 1, 2018 through June 30, 2018 semiannual reporting period.

### 5.6 Operation and Maintenance – Required Shutdowns

Records of routine maintenance are kept onsite.

Appendix A contains a summary of the operation or maintenance issues that required the groundwater extraction system to be shut down during the January 1, 2018 through June 30, 2018 semiannual reporting period.

Activities during the Second Quarter 2018 included two extended shutdowns.

- The extraction well system was offline from 6:36 a.m. on April 2, 2018 to 6:50 a.m. on April 3, 2018, and from 7:00 a.m. on April 3, 2018 to 2:02 p.m. on April 6, 2018, and from 4:16 p.m. on April 6, 2018 to 5:48 p.m. on April 6, 2018 for semiannual scheduled maintenance. The extraction wells were operated intermittently during the end of the outage to confirm piping re-assembly and pump operation. Total extraction system downtime during the extended shutdown was 4 days, 8 hours, 48 minutes.
- The extraction well system was offline from 6:16 p.m. June 18, 2018 to 6:40 p.m. June 19, 2018 and from 9:50 p.m. June 19, 2018 to 10:16 a.m. June 20, 2018 due to a bad batch of ferrous chloride

chemical that resulted in poor conversion of hexavalent chromium to trivalent chromium. This required the plant to be set in recirculation mode to troubleshoot the cause. Once the cause was determined, the ferrous chloride was replaced. The bad batch also resulted in excess solids that flocculated poorly and accumulated in the piping, the tanks between the pipe reactor, the clarifier, the microfilters, and the Pre-Treated Water Tank (T-500). A power outage also occurred during this shutdown. Some of the accumulated solids were removed from the equipment. Later plant outages in June were caused by this situation. Extraction system downtime was 1 day 12 hours 50 minutes.

## 5.7 Treatment Facility Modifications

No modifications were made to the IM-3 treatment facility that resulted in a material change in the quality or quantity of wastewater treated or discharged, nor resulted in a material change in the location of discharge, during the January 1, 2018 through June 30, 2018 semiannual period.

# Conclusions

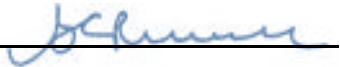
There were no exceedances of effluent limitations during the reporting period.

In addition, no incidents of non-compliance were identified during the reporting period. No events that caused an immediate or potential threat to human health or the environment, and no new releases of hazardous waste or hazardous waste constituents, or new solid waste management units, were identified during the reporting period.

# Certification

Certification Statement:

I declare under the penalty of law that I have personally examined and am familiar with the information submitted in this document, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of a fine and imprisonment for knowing violations.

Signature:   
Name: Curt Russell  
Company: Pacific Gas and Electric Company  
Title: Topock Site Manager  
Date: July 13, 2018



Tables

**Table 1. Sampling Station Descriptions***Second Quarter 2018 Monitoring Report for Interim Measure No. 3 Groundwater Treatment System*

Sample Station	Sample ID <sup>a</sup>	Location
Sampling Station A: Groundwater Treatment System Influent	SC-100B-WDR-###	Sample collected from tap on pipe into T-100 (see Figure TP-RP-10-10-04).
Sampling Station B: Groundwater Treatment System Effluent	SC-700B-WDR-###	Sample collected from tap on pipe downstream from T-700 (see Figure TP-RP-10-10-04).
Sampling Station D: Groundwater Treatment System Reverse Osmosis Concentrate	SC-701-WDR-###	Sample collected from tap on pipe into T-701 (see Figure PR-10-03 and PR-10-04).
Sampling Station E: Groundwater Treatment System Sludge	SC-SLUDGE-WDR-###	Sample collected from sludge accumulated in the phase separator used this quarter (see Figure TP-RP-10-10-06).

**Notes:**

### = Sequential sample identification number at each sample station

<sup>a</sup> The sample event number is included at the end of the sample ID (e.g., SC-100B-WDR-015).

**Table 2. Flow Monitoring Results***Second Quarter 2018 Monitoring Report for Interim Measure No. 3 Groundwater Treatment System*

<b>Parameter</b>	<b>System Influent<sup>a,b</sup> (gpm)</b>	<b>System Effluent<sup>b</sup> (gpm)</b>	<b>Reverse Osmosis Concentrate<sup>b</sup> (gpm)</b>
April 2018 Average Monthly Flowrate	4,819,356	4,792,588	38,649
May 2018 Average Monthly Flowrate	5,756,326	5,801,344	35,453
June 2018 Average Monthly Flowrate	5,140,983	5,163,189	23,408

**Notes:**

gpm: gallons per minute

<sup>a</sup> Extraction well TW-3D was operated during the Second Quarter 2018. Extraction wells TW-2D and PE-1 were only operated to collect a sample. Extraction well TW-2S did not operate during Second Quarter 2018.

<sup>b</sup> The difference between influent flow rate and the sum of the effluent and reverse osmosis concentrate flow rates during the Second Quarter 2018 is approximately 0.85% percent.

**Table 3. Sample Collection Dates***Second Quarter 2018 Monitoring Report for Interim Measure No. 3 Groundwater Treatment System*

Parameter	Sample Collection Dates	Results
Influent	April 2, 2018 May 2, 2018 June 5, 2018	See Table 4
Effluent	April 2, 2018 April 6, 2018 May 2, 2018 June 5, 2018	See Table 5
Reverse Osmosis Concentrate	April 2, 2018	See Table 6
Sludge <sup>a</sup>	Composite collected from each bin sent off-site during the previous calendar Quarter	See Table 7

**Notes:**<sup>a</sup> Sludge samples analysis is required quarterly by composite.

TABLE 4  
Topock IM-3 Waste Discharge Applicable or Relevant and Appropriate Requirements (ARARs)  
Influent Monitoring Results <sup>a</sup>  
Second Quarter 2018 Monitoring Report for Interim Measure No.3 Groundwater Treatment System

Sampling Frequency		Monthly						Quarterly																
Sample ID	Date	Analytes Units <sup>b</sup>  MDL	TDS	Turbidity	Specific Conductance	Field <sup>c</sup> pH	Chromium	Hexavalent Chromium	Aluminium	Ammonia (as N)	Antimony	Arsenic	Barium	Boron	Copper	Fluoride	Lead	Manganese	Molybdenum	Nickel	Nitrate/Nitrite (as N)	Sulfate	Iron	Zinc
			mg/L	NTU	µmhos/cm	pH units	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	µg/L	µg/L
			50.0	0.100	0.100	---	0.650	3.30	40.0	0.0780	0.160	0.0810	0.150	0.0740	0.550	0.0320	0.130	0.260	0.210	0.260	0.160	1.10	18.0	2.30
SC-100B-WDR-571	4/2/2018		4500	0.190	7300	7.1	510	510	ND (50.0)	ND (0.200)	ND (0.500)	2.90	29.0	1.10	ND (1.00)	2.70	ND (1.00)	7.00	21.0	ND (1.00)	2.80	520	ND (20.0)	ND (10.0)
RL			50.0	0.100	0.100	---	5.00	20.0	50.0	0.200	0.500	0.100	1.00	0.100	1.00	0.500	1.00	0.500	0.500	1.00	0.250	25.0	20.0	10.0
SC-100B-WDR-573	5/2/2018		4200	0.160	7200	7.2	480	480	---	---	---	---	---	---	---	---	---	7.20	---	---	---	---	---	---
RL			50.0	0.100	0.100	---	5.00	20.0	---	---	---	---	---	---	---	---	---	0.500	---	---	---	---	---	---
SC-100B-WDR-574	6/5/2018		4100	0.160	7100	7.3	470	470	---	---	---	---	---	---	---	---	---	6.90	---	---	---	---	---	---
RL			50.0	0.100	0.100	---	5.00	20.0	---	---	---	---	---	---	---	---	---	0.500	---	---	---	---	---	---

NOTES:  
(---) = not required by the ARARs Monitoring and Reporting Program  
J = concentration or reporting limits estimated by laboratory or validation  
MDL = method detection limit  
mg/L = milligrams per liter  
N = nitrogen  
ND = parameter not detected at the listed value  
NTU = nephelometric turbidity units  
RL = project reporting limit  
µg/L = micrograms per liter  
µmhos/cm = micromhos per centimeter

<sup>a</sup> Sampling Location for all influent samples is tap on pipe from extraction wells into tank T-100 (see attached P&ID TP-PR-10-10-04).  
<sup>b</sup> Units reported in this table are those units required in the ARARs.  
<sup>c</sup> Starting 11/20/2007, analysis of pH was switched from California certified laboratory analysis to field method pursuant to the Water Board letter dated October 16, 2007 – Clarification of Monitoring and Reporting Program Requirements, stating that pH measurements may be conducted in the field.

TABLE 5  
Topock IM-3 Waste Discharge Applicable or Relevant and Appropriate Requirements (ARARs)  
Effluent Monitoring Results<sup>a</sup>  
Second Quarter 2018 Monitoring Report for Interim Measure No.3 Groundwater Treatment System

Effluent Limits <sup>b</sup>	Ave. Monthly	NA	NA	NA	6.5-8.4	25	8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Max Daily	NA	NA	NA	6.5-8.4	50	16	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sampling Frequency		Monthly																					
<div> </div> <div>Analytes Units<sup>c</sup></div> <div>MDL<sup>d</sup></div>	<div> </div> <div> </div> <div> </div>	TDS	Turbidity	Specific Conductance	Field pH <sup>e</sup>	Chromium	Hexavalent Chromium	Aluminium	Ammonia (as N)	Antimony	Arsenic	Barium	Boron	Copper	Fluoride	Lead	Manganese	Molybdenum	Nickel	Nitrate/Nitrite (as N)	Sulfate	Iron	Zinc
		mg/L	NTU	µmhos/cm	pH units	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	µg/L	µg/L
		50.0	0.100	0.100	---	0.130	0.0330	40.0	0.0780	0.160	0.0810	0.150	0.0740	0.550	0.0130	0.130	0.260	0.210	0.260	0.160	1.10	18.0	2.30
Sample ID	Date																						
SC-700B-WDR-571	4/2/2018	4200	0.200	7200	7.1	1.30	ND (0.200)	440	ND (0.200)	ND (0.500)	0.100	16.0	1.00	ND (1.00)	2.30	ND (1.00)	24.0	20.0	2.40	2.50	490	ND (20.0)	ND (10.0)
	RL	50.0	0.100	0.100	---	1.00	0.200	50.0	0.200	0.500	0.100	1.00	0.100	1.00	0.500	1.00	0.500	0.500	1.00	0.250	25.0	20.0	10.0
SC-700B-WDR-572	4/6/2018	4400	0.590	7800	7.3	16.0	0.790	ND (50.0)	ND (0.200)	ND (0.500)	0.130	19.0	1.00	ND (1.00)J	2.60	ND (1.00)	130	27.0	6.40	2.70	510	820	ND (10.0)
	RL	50.0	0.100	0.100	---	1.00	0.200	50.0	0.200	0.500	0.100	1.00	0.100	1.00	0.500	1.00	2.50	0.500	1.00	0.250	25.0	20.0	10.0
SC-700B-WDR-573	5/2/2018	4000	0.160	7000	7.0	ND (1.00)	ND (0.200)	ND (50.0)	ND (0.200)	ND (0.500)	ND (0.100)	19.0	1.10	ND (1.00)	2.50	ND (1.00)	9.10	22.0	ND (1.00)	2.90	470	ND (20.0)	ND (10.0)
	RL	50.0	0.100	0.100	---	1.00	0.200	50.0	0.200	0.500	0.100	1.00	0.100	1.00	0.500	1.00	0.500	0.500	1.00	0.250	25.0	20.0	10.0
SC-700B-WDR-574	6/5/2018	4100	0.150	7000	7.1	ND (1.00)	ND (0.200)	ND (50.0)	ND (0.200)	ND (0.500)	ND (0.100)	16.0	0.990	ND (1.00)	2.40	ND (1.00)	9.60	22.0	1.10	2.70	470	ND (20.0)	ND (10.0)
	RL	50.0	0.100	0.100	---	1.00	0.200	50.0	0.200	0.500	0.100	1.00	0.100	1.00	0.200	1.00	0.500	0.500	1.00	0.250	25.0	20.0	10.0

NOTES:

(---) = not required by the ARARs Monitoring and Reporting Program  
J = concentration or reporting limits estimated by laboratory or validation  
MDL = method detection limit  
mg/L = milligrams per liter  
N = nitrogen  
NA = not applicable  
ND = parameter not detected at the listed value  
NTU = nephelometric turbidity units  
RL = project reporting limit  
µg/L = micrograms per liter  
µmhos/cm = micromhos per centimeter

<sup>a</sup> Sampling location for all effluent samples is tap on pipe downstream from tank T-700 to injection wells (see attached P&ID TP-PR-10-10-04).  
<sup>b</sup> In addition to the listed effluent limits, the ARARs state that the effluent shall not contain heavy metals, chemicals, pesticides or other constituents in concentrations toxic to human health.  
<sup>c</sup> Units reported in this table are those units required in the ARARs.  
<sup>d</sup> MDL listed is the target MDL by analysis method; however, the MDL may change for each sample analysis due to the dilution required by the matrix to meet the method QC requirements. The target MDL for each method/analyte combination is calculated annually.  
<sup>e</sup> Starting 11/20/2007, analysis of pH was switched from California certified laboratory analysis to field method pursuant to the Water Board letter dated October 16, 2007 – Clarification of Monitoring and Reporting Program Requirements, stating that pH measurements may be conducted in the field.

TABLE 6  
Topock IM-3 Waste Discharge Applicable or Relevant and Appropriate Requirements (ARARs)  
Reverse Osmosis Concentrate Monitoring Results <sup>a</sup>  
Second Quarter 2018 Monitoring Report for Interim Measure No.3 Groundwater Treatment System

Sampling Frequency		Quarterly																						
<div>Sample ID</div>	<div>Date</div>	<div>Analytes</div>	TDS	Specific Conductance	Field <sup>c</sup> pH	Chromium	Hexavalent Chromium	Antimony	Arsenic	Barium	Beryllium	Cadmium	Cobalt	Copper	Fluoride	Lead	Molybdenum	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
		<div>Units<sup>b</sup></div>	mg/L	µmhos/cm	pH units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		<div>MDL</div>	500	0.100	---	0.00013	0.00083	0.00078	0.00041	0.00075	0.0011	0.00026	0.000042	0.0027	0.130	0.00064	0.0011	0.00013	0.0013	0.0018	0.0012	0.00096	0.00028	0.0110
SC-701-WDR-571	4/2/2018		46000	57000	7.7	0.00170	ND (0.0050)	ND (0.0025)	0.00120	0.140	ND (0.0120)	ND (0.0025)	ND (0.00050)	ND (0.0050)	27.0	ND (0.0050)	0.230	ND (0.00020)	0.00660	0.0500	ND (0.0025)	ND (0.0025)	0.00250	ND (0.0500)
RL			500	0.100	---	0.0010	0.0050	0.0025	0.00050	0.0050	0.0120	0.0025	0.00050	0.0050	2.00	0.0050	0.0025	0.00020	0.0050	0.0025	0.0025	0.0025	0.0010	0.0500

NOTES:  
(---) = not required by the ARARs Monitoring and Reporting Program  
MDL = method detection limit  
mg/L = milligrams per liter  
ND = parameter not detected at the listed value  
RL = project reporting limit  
µg/L = micrograms per liter  
µmhos/cm = micromhos per centimeter

<sup>a</sup> Sampling location for all reverse osmosis samples is tap on pipe T-701 (see attached P&ID PR-10-04).  
<sup>b</sup> Units reported in this table are those units required in the ARARs.  
<sup>c</sup> Starting 11/20/2007, analysis of pH was switched from California certified laboratory analysis to field method pursuant to the Water Board letter dated October 16, 2007 – Clarification of Monitoring and Reporting Program Requirements, stating that pH measurements may be conducted in the field.

TABLE 7  
Topock IM-3 Waste Discharge Applicable or Relevant and Appropriate Requirements (ARARs)  
Sludge Monitoring Results<sup>a</sup>  
Second Quarter 2018 Monitoring Report for Interim Measure No.3 Groundwater Treatment System

Sampling Frequency		Quarterly																			
<div>Sample ID</div>	<div>Date</div>	Chromium	Hexavalent Chromium	Antimony	Arsenic	Barium	Beryllium	Cadmium	Cobalt	Copper	Fluoride	Lead	Molybdenum	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
		MDL	MDL	MDL	MDL	MDL	MDL	MDL	MDL	MDL	MDL	MDL	MDL	MDL	MDL	MDL	MDL	MDL	MDL	MDL	MDL
Phase Separator-571-Sludge	4/2/2018	2900	49.0	6.00	13.0	65.0	ND (2.10)	ND (2.10)	4.00	140	55.0	ND (2.10)	3.40	ND (0.210)	30.0	ND (2.10)	ND (2.10)	5.90	36.0	37.0	
RL		2.10	2.10	4.20	2.10	2.10	2.10	2.10	2.10	4.20	10.0	2.10	2.10	0.210	2.10	2.10	2.10	4.20	2.10	2.10	

NOTES:  
(---) = not required by the ARARs Monitoring and Reporting Program  
J = concentration or reporting limits estimated by laboratory or validation  
mg/kg = milligrams per kilogram  
mg/L = milligrams per liter  
MDL = method detection limit  
ND = parameter not detected at the listed reporting limit  
RL = project reporting limit

<sup>a</sup> Sampling location for all sludge samples is the sludge collection bin (see attached P&ID TP-PR-10-10-06).  
<sup>b</sup> Units reported in this table are those units required in the ARARs.  
<sup>c</sup> Sludge samples analysis is required quarterly by composite; sludge samples were collected from each container prior to shipment off-site, and combined for the composite sample of the preceding quarter.



**TABLE 8**

Topock IM-3 Waste Discharge Applicable or Relevant and Appropriate Requirements (ARARs)  
Monitoring Information  
Second Quarter 2018 Monitoring Report for Interim Measure No.3 Groundwater Treatment System

Location	Sample ID	Sampler Name	Sample Date	Sample Time	Lab	Analysis Method	Parameter	Analysis Date	Lab Technician
SC-100B	SC-100B-WDR-571	Cameron Stone	4/2/2018	9:30:00 AM	ASSET	EPA 120.1	SC	4/3/2018	Lilia Ramit
					ASSET	EPA 200.7	AL	4/12/2018	Claire Ignacio
					ASSET	EPA 200.7	B	4/12/2018	Claire Ignacio
					ASSET	EPA 200.7	FE	4/12/2018	Claire Ignacio
					ASSET	EPA 200.8	AS	4/13/2018	Claire Ignacio
					ASSET	EPA 200.8	BA	4/13/2018	Claire Ignacio
					ASSET	EPA 200.8	CR	4/13/2018	Claire Ignacio
					ASSET	EPA 200.8	CU	4/13/2018	Claire Ignacio
					ASSET	EPA 200.8	MN	4/13/2018	Claire Ignacio
					ASSET	EPA 200.8	MO	4/13/2018	Claire Ignacio
					ASSET	EPA 200.8	NI	4/15/2018	Claire Ignacio
					ASSET	EPA 200.8	PB	4/13/2018	Claire Ignacio
					ASSET	EPA 200.8	SB	4/13/2018	Claire Ignacio
					ASSET	EPA 200.8	ZN	4/13/2018	Claire Ignacio
					ASSET	EPA 218.6	CR6	4/3/2018	Ria Abes
					ASSET	EPA 300.0	FL	4/3/2018	Ria Abes
					ASSET	EPA 300.0	SO4	4/3/2018	Ria Abes
					Field	HACH	PH	4/2/2018	Cameron Stone
					ASSET	SM 2540C	TDS	4/3/2018	Lilia Ramit
					ASSET	SM 4500-NO3F	NO3NO2N	4/4/2018	Quennie Manimtim
					ASSET	SM2130B	TRB	4/3/2018	Lilia Ramit
					BCLabs	SM4500NH3G	NH3N	4/11/2018	Quennie Manimtim
SC-100B	SC-100B-WDR-573	Ron Phelps	5/2/2018	1:30:00 PM	ASSET	EPA 120.1	SC	5/3/2018	Lilia Ramit
					ASSET	EPA 200.8	CR	5/15/2018	Claire Ignacio
					ASSET	EPA 200.8	MN	5/15/2018	Claire Ignacio
					ASSET	EPA 218.6	CR6	5/7/2018	Ria Abes
					Field	HACH	PH	5/2/2018	Ron Phelps
					ASSET	SM 2540C	TDS	5/7/2018	Lilia Ramit
					ASSET	SM2130B	TRB	5/3/2018	Lilia Ramit
SC-100B	SC-100B-WDR-574	George Gloria	6/5/2018	2:38:00 PM	ASSET	EPA 120.1	SC	6/6/2018	Lilia Ramit
					ASSET	EPA 200.8	CR	6/7/2018	Claire Ignacio
					ASSET	EPA 200.8	MN	6/7/2018	Claire Ignacio
					ASSET	EPA 218.6	CR6	6/6/2018	Ria Abes
					ASSET	SM 2540C	TDS	6/7/2018	Lilia Ramit
					ASSET	SM2130B	TRB	6/6/2018	Lilia Ramit

**TABLE 8**

Topock IM-3 Waste Discharge Applicable or Relevant and Appropriate Requirements (ARARs)  
Monitoring Information  
Second Quarter 2018 Monitoring Report for Interim Measure No.3 Groundwater Treatment System

Location	Sample ID	Sampler Name	Sample Date	Sample Time	Lab	Analysis Method	Parameter	Analysis Date	Lab Technician
SC-100B	SC-100B-WDR-574	George Gloria	6/5/2018	2:50:00 PM	Field	HACH	PH	6/5/2018	George Gloria
SC-700B	SC-700B-WDR-571	Cameron Stone	4/2/2018	9:40:00 AM	ASSET	EPA 120.1	SC	4/3/2018	Lilia Ramit
					ASSET	EPA 200.7	AL	4/12/2018	Claire Ignacio
					ASSET	EPA 200.7	B	4/12/2018	Claire Ignacio
					ASSET	EPA 200.7	FE	4/12/2018	Claire Ignacio
					ASSET	EPA 200.8	AS	4/13/2018	Claire Ignacio
					ASSET	EPA 200.8	BA	4/13/2018	Claire Ignacio
					ASSET	EPA 200.8	CR	4/13/2018	Claire Ignacio
					ASSET	EPA 200.8	CU	4/13/2018	Claire Ignacio
					ASSET	EPA 200.8	MN	4/13/2018	Claire Ignacio
					ASSET	EPA 200.8	MO	4/13/2018	Claire Ignacio
					ASSET	EPA 200.8	NI	4/15/2018	Claire Ignacio
					ASSET	EPA 200.8	PB	4/13/2018	Claire Ignacio
					ASSET	EPA 200.8	SB	4/13/2018	Claire Ignacio
					ASSET	EPA 200.8	ZN	4/13/2018	Claire Ignacio
					ASSET	EPA 218.6	CR6	4/3/2018	Ria Abes
					ASSET	EPA 300.0	FL	4/3/2018	Ria Abes
					ASSET	EPA 300.0	SO4	4/3/2018	Ria Abes
					Field	HACH	PH	4/2/2018	Cameron Stone
					ASSET	SM 2540C	TDS	4/3/2018	Lilia Ramit
					ASSET	SM 4500-NO3F	NO3NO2N	4/4/2018	Quennie Manintim
					ASSET	SM2130B	TRB	4/3/2018	Lilia Ramit
					BCLabs	SM4500NH3G	NH3N	4/11/2018	Quennie Manintim
SC-700B	SC-700B-WDR-572	Ryan Phelps	4/6/2018	6:20:00 PM	ASSET	EPA 120.1	SC	4/7/2018	Lilia Ramit
					ASSET	EPA 200.7	AL	4/13/2018	Claire Ignacio
					ASSET	EPA 200.7	B	4/13/2018	Claire Ignacio
					ASSET	EPA 200.7	FE	4/13/2018	Claire Ignacio
					ASSET	EPA 200.8	AS	4/13/2018	Claire Ignacio
					ASSET	EPA 200.8	BA	4/13/2018	Claire Ignacio
					ASSET	EPA 200.8	CR	4/13/2018	Claire Ignacio
					ASSET	EPA 200.8	CU	4/13/2018	Claire Ignacio
					ASSET	EPA 200.8	MN	4/13/2018	Claire Ignacio
					ASSET	EPA 200.8	MO	4/13/2018	Claire Ignacio
					ASSET	EPA 200.8	NI	4/15/2018	Claire Ignacio
					ASSET	EPA 200.8	PB	4/13/2018	Claire Ignacio

TABLE 8

Topock IM-3 Waste Discharge Applicable or Relevant and Appropriate Requirements (ARARs)  
Monitoring Information  
Second Quarter 2018 Monitoring Report for Interim Measure No.3 Groundwater Treatment System

Location	Sample ID	Sampler Name	Sample Date	Sample Time	Lab	Analysis Method	Parameter	Analysis Date	Lab Technician
SC-700B	SC-700B-WDR-572	Ryan Phelps	4/6/2018	6:20:00 PM	ASSET	EPA 200.8	SB	4/13/2018	Claire Ignacio
					ASSET	EPA 200.8	ZN	4/13/2018	Claire Ignacio
					ASSET	EPA 218.6	CR6	4/9/2018	Ria Abes
					ASSET	EPA 300.0	FL	4/9/2018	Ria Abes
					ASSET	EPA 300.0	SO4	4/10/2018	Ria Abes
					Field	HACH	PH	4/6/2018	Cameron Stone
					ASSET	SM 2540C	TDS	4/10/2018	Lilia Ramit
					ASSET	SM 4500-NO3F	NO3NO2N	4/13/2018	Quennie Manimtim
					ASSET	SM2130B	TRB	4/7/2018	Lilia Ramit
					BCLabs	SM4500NH3G	NH3N	4/17/2018	Quennie Manimtim
SC-700B	SC-700B-WDR-573	Ron Phelps	5/2/2018	1:33:00 PM	ASSET	EPA 120.1	SC	5/3/2018	Lilia Ramit
					ASSET	EPA 200.7	AL	5/16/2018	Claire Ignacio
					ASSET	EPA 200.7	B	5/16/2018	Claire Ignacio
					ASSET	EPA 200.7	FE	5/16/2018	Claire Ignacio
					ASSET	EPA 200.8	AS	5/15/2018	Claire Ignacio
					ASSET	EPA 200.8	BA	5/15/2018	Claire Ignacio
					ASSET	EPA 200.8	CR	5/15/2018	Claire Ignacio
					ASSET	EPA 200.8	CU	5/15/2018	Claire Ignacio
					ASSET	EPA 200.8	MN	5/15/2018	Claire Ignacio
					ASSET	EPA 200.8	MO	5/15/2018	Claire Ignacio
					ASSET	EPA 200.8	NI	5/15/2018	Claire Ignacio
					ASSET	EPA 200.8	PB	5/15/2018	Claire Ignacio
					ASSET	EPA 200.8	SB	5/15/2018	Claire Ignacio
					ASSET	EPA 200.8	ZN	5/15/2018	Claire Ignacio
					ASSET	EPA 218.6	CR6	5/7/2018	Ria Abes
					ASSET	EPA 300.0	FL	5/7/2018	Ria Abes
					ASSET	EPA 300.0	SO4	5/7/2018	Ria Abes
					Field	HACH	PH	5/2/2018	Ron Phelps
					ASSET	SM 2540C	TDS	5/7/2018	Lilia Ramit
					ASSET	SM 4500-NO3F	NO3NO2N	5/11/2018	Quennie Manimtim
					ASSET	SM2130B	TRB	5/3/2018	Lilia Ramit
					BCLabs	SM4500NH3G	NH3N	5/7/2018	Quennie Manimtim
SC-700B	SC-700B-WDR-574	George Gloria	6/5/2018	2:52:00 PM	ASSET	EPA 120.1	SC	6/6/2018	Lilia Ramit
					ASSET	EPA 200.7	AL	6/18/2018	Claire Ignacio
					ASSET	EPA 200.7	B	6/17/2018	Claire Ignacio

TABLE 8

Topock IM-3 Waste Discharge Applicable or Relevant and Appropriate Requirements (ARARs)  
Monitoring Information  
Second Quarter 2018 Monitoring Report for Interim Measure No.3 Groundwater Treatment System

Location	Sample ID	Sampler Name	Sample Date	Sample Time	Lab	Analysis Method	Parameter	Analysis Date	Lab Technician
SC-700B	SC-700B-WDR-574	George Gloria	6/5/2018	2:52:00 PM	ASSET	EPA 200.7	FE	6/17/2018	Claire Ignacio
					ASSET	EPA 200.8	AS	6/7/2018	Claire Ignacio
					ASSET	EPA 200.8	BA	6/7/2018	Claire Ignacio
					ASSET	EPA 200.8	CR	6/7/2018	Claire Ignacio
					ASSET	EPA 200.8	CU	6/7/2018	Claire Ignacio
					ASSET	EPA 200.8	MN	6/7/2018	Claire Ignacio
					ASSET	EPA 200.8	MO	6/7/2018	Claire Ignacio
					ASSET	EPA 200.8	NI	6/7/2018	Claire Ignacio
					ASSET	EPA 200.8	PB	6/7/2018	Claire Ignacio
					ASSET	EPA 200.8	SB	6/7/2018	Claire Ignacio
					ASSET	EPA 200.8	ZN	6/7/2018	Claire Ignacio
					ASSET	EPA 218.6	CR6	6/6/2018	Ria Abes
					ASSET	EPA 300.0	FL	6/7/2018	Ria Abes
					ASSET	EPA 300.0	SO4	6/6/2018	Ria Abes
					ASSET	SM 2540C	TDS	6/7/2018	Lilia Ramit
					ASSET	SM 4500-NO3F	NO3NO2N	6/14/2018	Quennie Manimtim
					ASSET	SM2130B	TRB	6/6/2018	Lilia Ramit
					BCLabs	SM4500NH3G	NH3N	6/13/2018	Quennie Manimtim
				3:04:00 PM	Field	HACH	PH	6/5/2018	George Gloria
SC-701	SC-701-WDR-571	Cameron Stone	4/2/2018	9:40:00 AM	ASSET	EPA 120.1	SC	4/3/2018	Lilia Ramit
					ASSET	EPA 200.8	AG	4/13/2018	Claire Ignacio
					ASSET	EPA 200.8	AS	4/13/2018	Claire Ignacio
					ASSET	EPA 200.8	BA	4/13/2018	Claire Ignacio
					ASSET	EPA 200.8	BE	4/13/2018	Claire Ignacio
					ASSET	EPA 200.8	CD	4/13/2018	Claire Ignacio
					ASSET	EPA 200.8	CO	4/13/2018	Claire Ignacio
					ASSET	EPA 200.8	CR	4/13/2018	Claire Ignacio
					ASSET	EPA 200.8	CU	4/13/2018	Claire Ignacio
					ASSET	EPA 200.8	MN	4/13/2018	Claire Ignacio
					ASSET	EPA 200.8	MO	4/13/2018	Claire Ignacio
					ASSET	EPA 200.8	NI	4/15/2018	Claire Ignacio
					ASSET	EPA 200.8	PB	4/13/2018	Claire Ignacio
					ASSET	EPA 200.8	SB	4/13/2018	Claire Ignacio
					ASSET	EPA 200.8	SE	4/13/2018	Claire Ignacio
					ASSET	EPA 200.8	TL	4/13/2018	Claire Ignacio
					ASSET	EPA 200.8	V	4/13/2018	Claire Ignacio

**TABLE 8**

Topock IM-3 Waste Discharge Applicable or Relevant and Appropriate Requirements (ARARs)  
Monitoring Information  
Second Quarter 2018 Monitoring Report for Interim Measure No.3 Groundwater Treatment System

Location	Sample ID	Sampler Name	Sample Date	Sample Time	Lab	Analysis Method	Parameter	Analysis Date	Lab Technician
SC-701	SC-701-WDR-571	Cameron Stone	4/2/2018	9:40:00 AM	ASSET	EPA 200.8	ZN	4/13/2018	Claire Ignacio
					ASSET	EPA 218.6	CR6	4/3/2018	Ria Abes
					ASSET	EPA 245.1	HG	4/6/2018	Claire Ignacio
					ASSET	EPA 300.0	FL	4/3/2018	Ria Abes
					Field	HACH	PH	4/2/2018	Cameron Stone
					ASSET	SM 2540C	TDS	4/3/2018	Lilia Ramit
Phase Separator	Phase Separator-571-Sludge	George Gloria	4/2/2018	9:15:00 AM	ASSET	EPA 300.0	FL	4/10/2018	Ria Abes
					ASSET	EPA 6010B	AG	4/3/2018	Claire Ignacio
					ASSET	EPA 6010B	AS	4/3/2018	Claire Ignacio
					ASSET	EPA 6010B	BA	4/3/2018	Claire Ignacio
					ASSET	EPA 6010B	BE	4/3/2018	Claire Ignacio
					ASSET	EPA 6010B	CD	4/3/2018	Claire Ignacio
					ASSET	EPA 6010B	CO	4/3/2018	Claire Ignacio
					ASSET	EPA 6010B	CR	4/3/2018	Claire Ignacio
					ASSET	EPA 6010B	CU	4/3/2018	Claire Ignacio
					ASSET	EPA 6010B	MN	4/3/2018	Claire Ignacio
					ASSET	EPA 6010B	MO	4/3/2018	Claire Ignacio
					ASSET	EPA 6010B	NI	4/3/2018	Claire Ignacio
					ASSET	EPA 6010B	PB	4/3/2018	Claire Ignacio
					ASSET	EPA 6010B	SB	4/3/2018	Claire Ignacio
					ASSET	EPA 6010B	SE	4/3/2018	Claire Ignacio
					ASSET	EPA 6010B	TL	4/3/2018	Claire Ignacio
					ASSET	EPA 6010B	V	4/3/2018	Claire Ignacio
					ASSET	EPA 6010B	ZN	4/3/2018	Claire Ignacio
					ASSET	EPA 7471A	HG	4/3/2018	Claire Ignacio
					ASSET	SW 7199	CR6	4/5/2018	Ria Abes

**TABLE 8**

Topock IM-3 Waste Discharge Applicable or Relevant and Appropriate Requirements (ARARs)  
Monitoring Information  
Second Quarter 2018 Monitoring Report for Interim Measure No.3 Groundwater Treatment System

**NOTES:**

SC-700B = Sampling location for all effluent samples is tap on pipe downstream from tank T-700 to injection well IW-2 (see attached P&ID TP-PR-10-10-04).

SC-100B = Sampling location for all influent samples is tap on pipe from extraction wells into tank T-100 (see attached P&ID TP-PR-10-10-04).

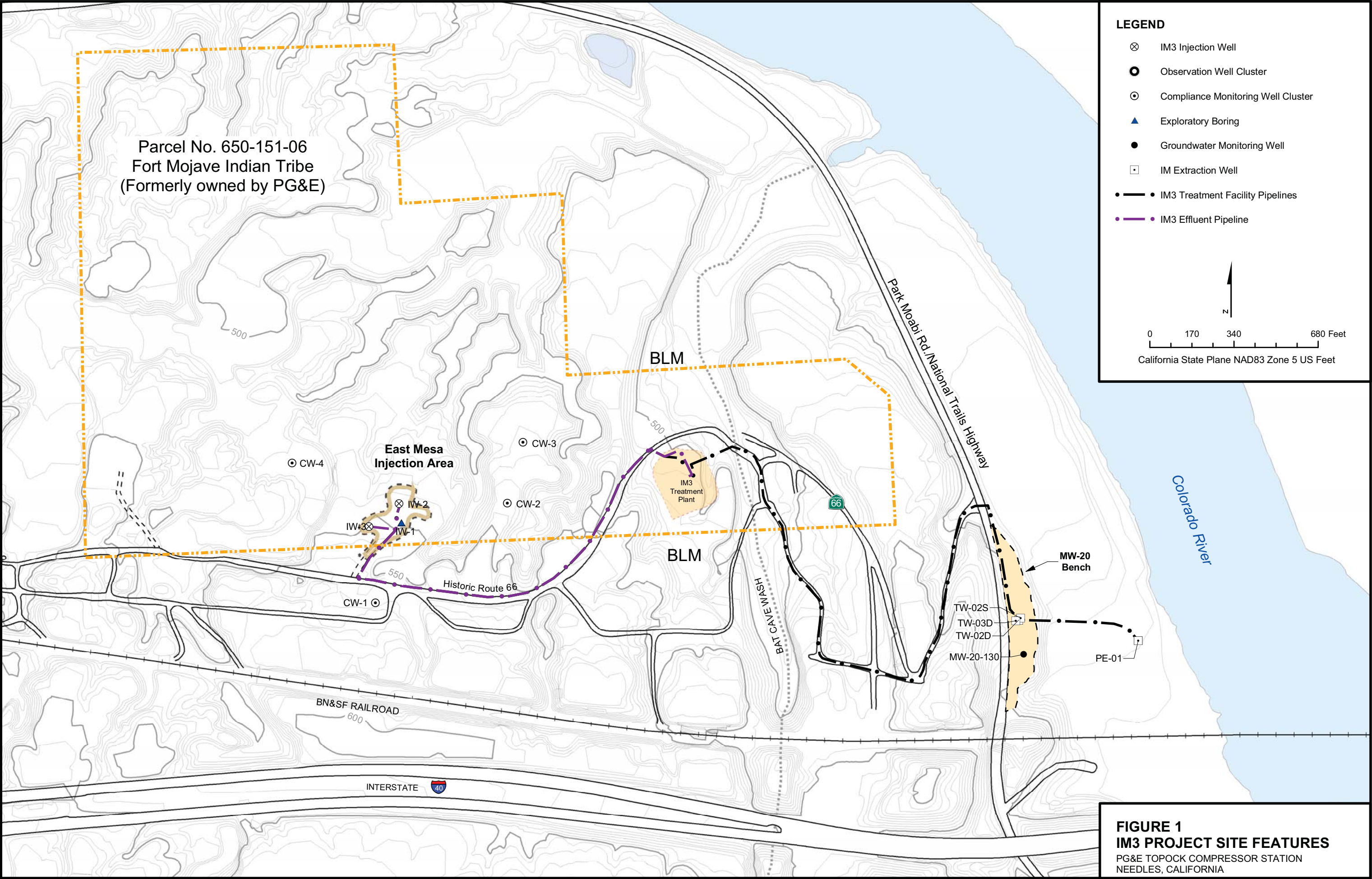
SC-701 = Sampling location for all reverse osmosis samples is tap on pipe T-701 (see attached P&ID PR-10-04).

Prior to April 11, 2007 the analytical methods listed in the 40 CFR Part 136 for pH and TDS were E150.1 and E160.1, respectively. Per EPA and Department of Health Services guidelines, the analytical methods listed in the current 40 CFR Part 136 have changed to SM4500-H B and SM2540C as shown on the table.

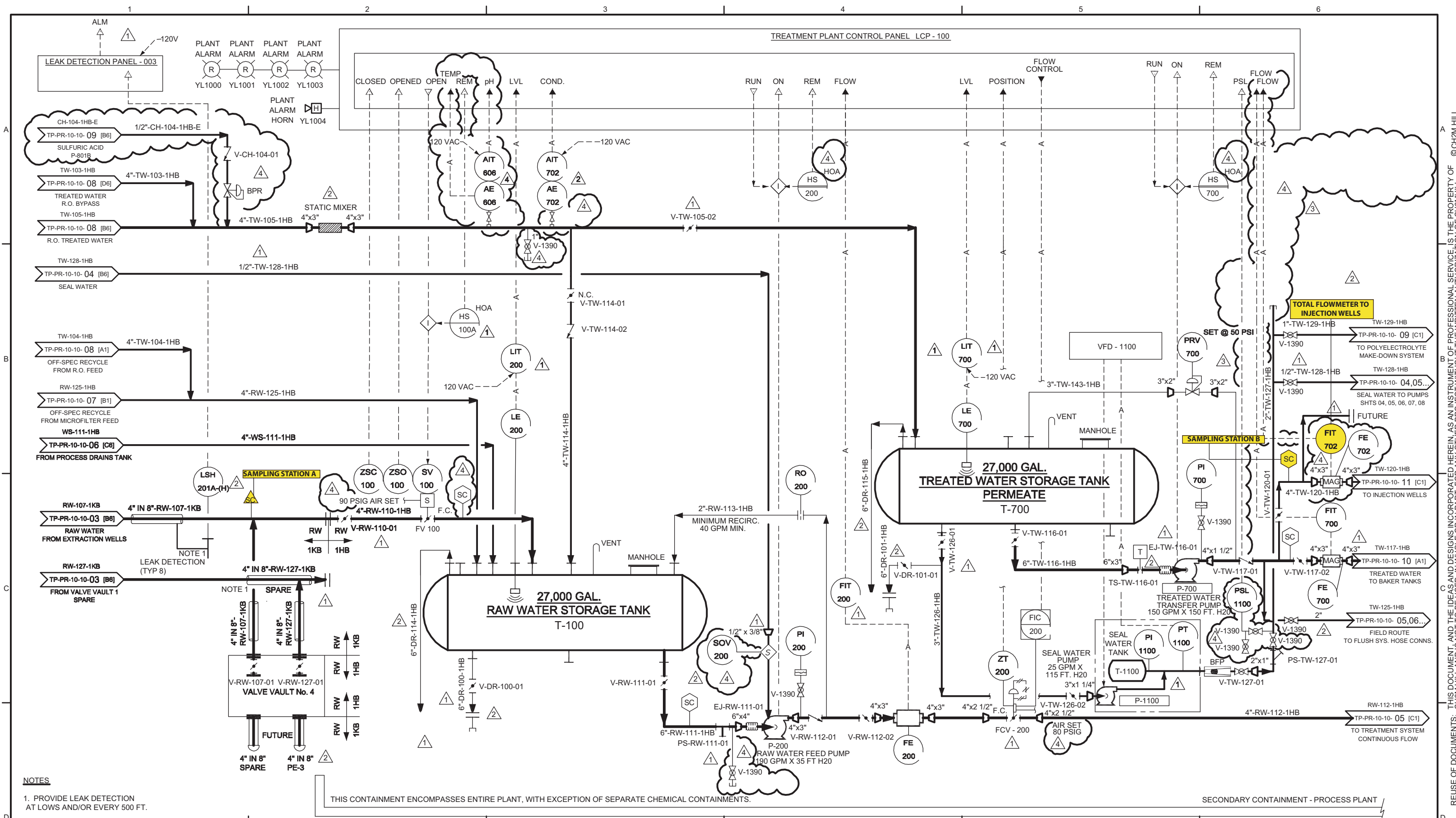
ALKB =	alkalinity, bicarb as CaCO <sub>3</sub>	MO =	molybdenum
ALKC =	alkalinity, carb as CaCO <sub>3</sub>	MOIST =	moisture
AL =	aluminum	NH <sub>3</sub> N =	ammonia (as N)
Ag =	silver	NI =	nickel
AS =	arsenic	NO <sub>3</sub> NO <sub>2</sub> N =	nitrate/nitrite (as N)
B =	boron	PB =	lead
BA =	barium	PH =	pH
BE =	beryllium	SB =	antimony
CD =	cadmium	SC =	specific conductance
CO =	cobalt	SE =	selenium
CR =	chromium	SO <sub>4</sub> =	sulfate
CR <sub>6</sub> =	hexavalent chromium	TDS =	total dissolved solids
CU =	copper	TL =	thallium
FE =	iron	TLI =	Truesdail Laboratories, Inc.
FETD =	iron, dissolved	TRB =	turbidity
FL =	fluoride	V =	vanadium
HG =	mercury	ZN =	zinc
MN =	manganese		
MND =	manganese, dissolved		

Figures







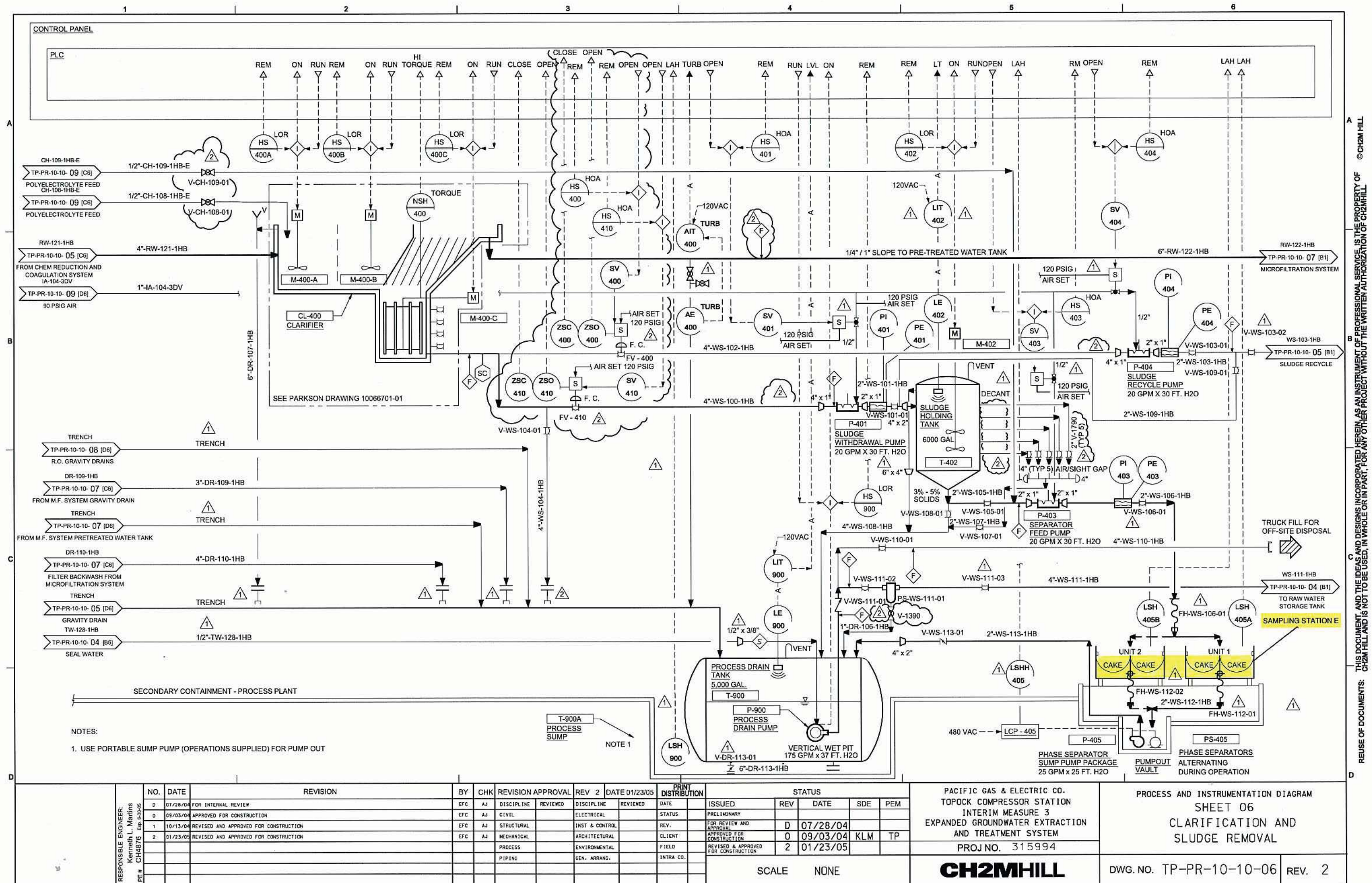


NO.		DATE	REVISION	BY	CHK	REVISION APPROVAL	REV 4	DATE 09/21/05	PRINT DISTRIBUTION	STATUS				PACIFIC GAS & ELECTRIC CO. TOPOCK COMPRESSOR STATION INTERIM MEASURE 3 EXPANDED GROUNDWATER EXTRACTION AND TREATMENT SYSTEM PROJ NO. 315994		PROCESS AND INSTRUMENTATION DIAGRAM SHEET 04 STORAGE AREA	
D	07/28/04		FOR INTERNAL REVIEW	EFC	AJ	DISCIPLINE	REVIEWED	DISCIPLINE	REVIEWED	DATE	ISSUED	REV	DATE	SDE	PEM	DWG. NO. TP-PR-10-10-04 REV. 4	
0	09/03/04		APPROVED FOR CONSTRUCTION	EFC	AJ	CIVIL		ELECTRICAL		STATUS	PRELIMINARY						
1	10/13/04		REVISED AND APPROVED FOR CONSTRUCTION	EFC	AJ	STRUCTURAL		INST & CONTROL		REV.	FOR REVIEW AND APPROVAL	D	07/28/04				
2	01/23/05		REVISED AND APPROVED FOR CONSTRUCTION	EFC	AJ	MECHANICAL		ARCHITECTURAL		CLIENT	APPROVED FOR CONSTRUCTION	0	09/03/04	KLM	TP		
3	02/14/05		ADDED RECIRC. LINE AND PRV VALVE TO T-700 - APPROVED FOR CONSTRUCTION	EFC	AJ	PROCESS		ENVIRONMENTAL		FIELD	REVISED & APPROVED FOR CONSTRUCTION	4	/ /				
4	09/21/05		REVISED PER AS-BUILT CONDITIONS	EFC	AJ	PIPING		GEN. ARRANG.		INTRA CO.						SCALE NONE	
														CH2MHILL			

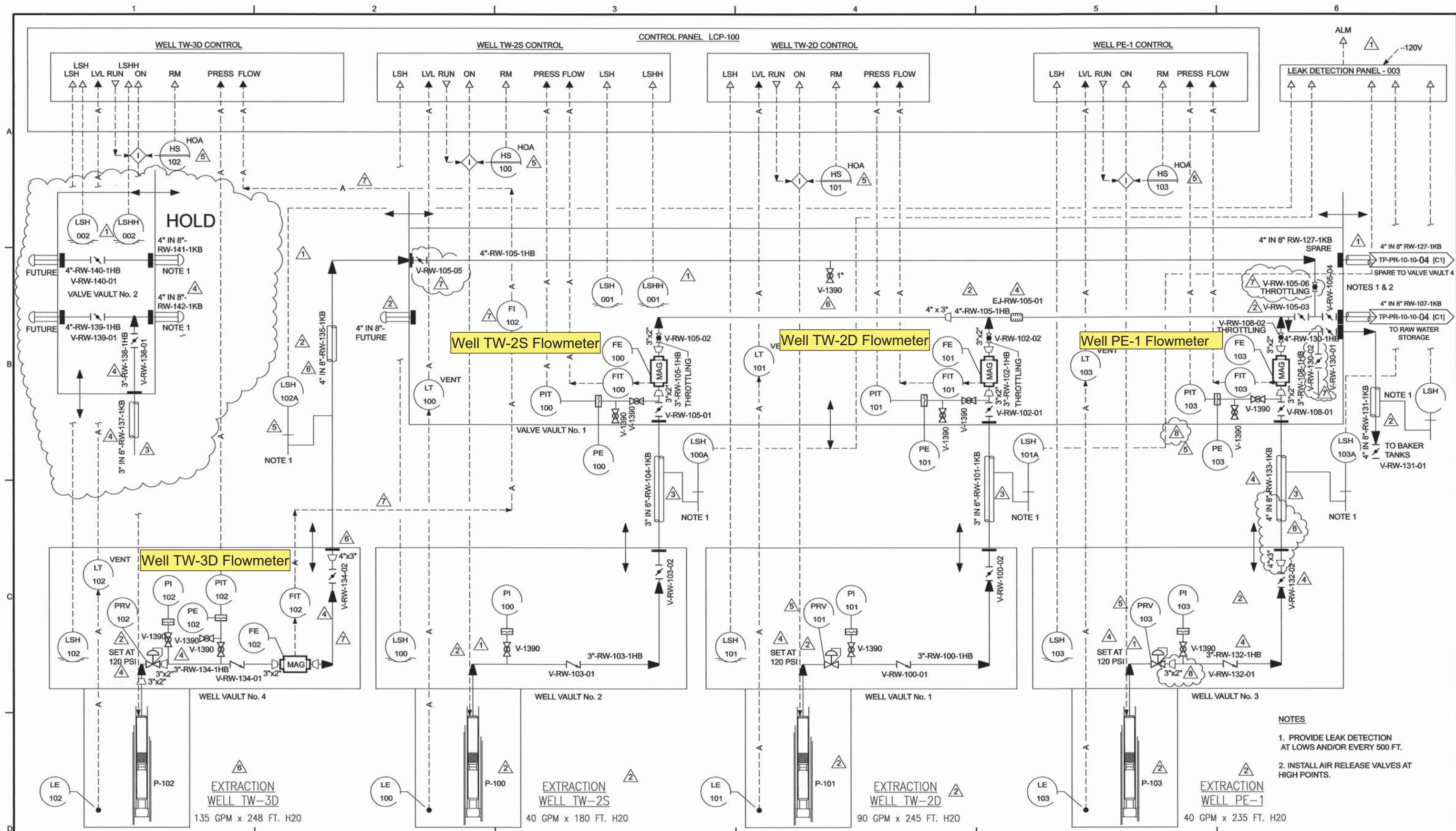












RESPONSIBLE ENGINEER:  
Kenneth L. Martins  
PE # CH4876 Exp. 6-30-05

NO.	DATE	REVISION	BY	CHK	REVISION APPROVAL	REV 8	DATE 12/06/05	PRINT DISTRIBUTION	STATUS
8	12/07/05	REMOVED PE-1 HOLDS	JBW	SDH	DISCIPLINE	REVIEWED	DISCIPLINE	REVIEWED	DATE
1	10/13/04	REVISED AND APPROVED FOR CONSTRUCTION	EFC	AJ	CIVIL	—	ELECTRICAL	—	STATUS
2	01/23/05	REVISED AND APPROVED FOR CONSTRUCTION	EFC	AJ	STRUCTURAL	—	INST. & CONTROL	—	REV.
3	03/16/05	DELETED NOTES, APPROVED FOR CONSTRUCTION	EFC	AJ	MECHANICAL	—	ARCHITECTURAL	—	CLIENT
4	07/20/05	RELIEF VALVE SETTINGS, WELL PE-1 LINE TAGS, HOLDS REMOVED, APPROVED FOR CONSTRUCTION	EFC	AJ	PROCESS	—	ENVIRONMENTAL	—	FIELD
5	09/27/05	FINAL RECORD ISSUE	EFC	AJ	PIPING	SDH	GEN. ARRANG.	—	INTRA CO.
6	10/06/05	REVISED FINAL RECORD - ADDED TW-3D	EFC	AJ	—	—	—	—	—
7	10/19/05	REVISED AS NOTED	EFC	AJ	—	—	—	—	—

SCALE NONE

PACIFIC GAS & ELECTRIC CO.  
TOPOCK COMPRESSOR STATION  
INTERIM MEASURE 3  
EXPANDED GROUNDWATER EXTRACTION  
AND TREATMENT SYSTEM  
PROJ. NO. 315994

**CH2MHILL**

PROCESS AND INSTRUMENTATION DIAGRAM  
SHEET 03  
EXTRACTION WELLS  
PE-1, TW-2D, TW-2S AND TW-3D

DWG. NO. TP-PR-10-10-03 REV. 8

FILENAME: tpr101003.dwg

PLOT DATE: 19-OCT-2005

PLOT TIME:

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Appendix A  
Semiannual Operations and  
Maintenance Log,  
January 1, 2018 through June 30, 2018

# Semiannual Operations and Maintenance Log, January 1, 2018 through June 30, 2018

Downtime is defined as any period when all extraction wells are not operating, so that no groundwater is being extracted and piped into IM-3 as influent. Periods of planned and unplanned extraction system downtime are summarized here. The times shown are in Pacific Standard Time (PST) to be consistent with other data (e.g., water level data) collected at the site.

## January 2018

During January 2018, extraction well TW-3D operated at a target pump rate of 135 gpm excluding periods of planned and unplanned downtime. Extraction well TW-2S was not operated during January 2018. Extraction wells TW-2D and PE-01 were only operated to collect a sample during January 2018. The operational run time for the IM-3 groundwater extraction system (combined or individual pumping) was 98.3 percent during the January 2018 reporting period.

The IM-3 facility treated approximately 5,950,063 gallons of extracted groundwater during January 2018.

Periods of planned and unplanned extraction system downtime (that together resulted an approximately 1.7 percent downtime during January 2018) are summarized below.

- **January 3, 2018 (planned):** The extraction well system was offline from 7:46 a.m. to 10:54 a.m. to change out microfilter modules due to high transmembrane pressure. Extraction system downtime was 3 hours 8 minutes.
- **January 4, 2018 (unplanned):** The extraction system was offline from 10:58 a.m. to 11:00 a.m. due to a programmable logic controller (PLC) and human-machine interface (HMI) connectivity issue. Extraction system downtime was 2 minutes.
- **January 5, 2018 (planned):** The extraction system was offline from 10:32 a.m. to 10:44 a.m. due to testing of the pipeline critical alarms and leak detection system. Extraction system downtime was 12 minutes.
- **January 9, 2018 (unplanned):** The extraction well system was offline from 3:34 a.m. to 4:00 a.m. due to loss of power from the City of Needles. Extraction system downtime was 26 minutes.
- **January 9, 2018 (planned):** The extraction well system was offline from 11:20 a.m. to 1:08 p.m. to change out microfilter modules due to high transmembrane pressure. Extraction system downtime was 1 hour 48 minutes.
- **January 13, 2018 (unplanned):** The extraction well system was offline from 12:12 p.m. to 1:46 p.m. due to the Clarifier Feed Pump (P-400) shutting off for unknown reasons, which caused a high level at Raw Water Storage Tank (T-100). Extraction system downtime was 1 hour 34 minutes.
- **January 16, 2018 (planned):** The extraction well system was offline from 4:48 p.m. to 5:08 p.m. due to a blockage in the piping between Iron Oxidation Tanks T-301A, B, and C; this situation forced the plant to operate at slower pumping rates, which caused high levels in the Chromium Reduction Reactor Tank (T-300A) and T-100. Extraction system downtime was 20 minutes.



- **January 19, 2018 (planned):** The extraction well system was offline from 10:12 a.m. to 11:56 a.m. to change out microfilter modules due to high transmembrane pressure. Extraction system downtime was 1 hour 44 minutes.
- **January 22, 2018 (planned):** The extraction well system was offline from 10:04 a.m. to 11:30 a.m. due to a blockage in the piping between Iron Oxidation Tanks T-301A, B, and C; this situation forced the plant to operate at slower rates, which caused a high level in T-100. Extraction was shut down to lower the tank level in T-100. Extraction system downtime was 1 hour 26 minutes.
- **January 24, 2018 (planned):** The extraction well system was offline from 9:02 a.m. to 10:04 a.m. due to a blockage in the piping between Iron Oxidation Tanks T-301A, B, and C; this situation forced the plant to operate at slower rates, which caused a high level in T-100. Extraction was shut down to lower the tank level in T-100. Extraction system downtime was 1 hour 2 minutes.
- **January 30, 2018 (planned):** The extraction well system was offline from 2:38 a.m. to 3:20 a.m. due to a valve failure in the air line at T-100. Extraction system downtime was 42 minutes.

## February 2018

During February 2018, extraction well TW-3D operated at a target pump rate of 135 gpm excluding periods of planned and unplanned downtime. Extraction well TW-2S was not operated during February 2018. Extraction wells TW-2D and PE-01 were only operated to collect a sample during February 2018. The operational run time for the IM-3 groundwater extraction system (combined or individual pumping) was 96.7 percent during the February 2018 reporting period.

The IM-3 facility treated approximately 5,276,125 gallons of extracted groundwater during February 2018. The IM-3 facility treated 375 gallons of purge water during February 2018.

Periods of planned and unplanned extraction system downtime (that together resulted an approximately 3.3 percent downtime during February 2018) are summarized below.

- **February 1, 2018 (planned):** The extraction well system was offline from 10:10 a.m. to 11:16 a.m. to change out microfilter modules due to high transmembrane pressure. Extraction system downtime was 1 hour 6 minutes.
- **February 2, 2018 (planned):** The extraction system was offline from 11:40 a.m. to 12:04 p.m. due to testing of the pipeline critical alarms and leak detection system. Extraction system downtime was 24 minutes.
- **February 6, 2018 (unplanned):** The extraction system was offline from 3:22 p.m. to 4:02 p.m. due to collecting a total depth measurement at extraction well TW-3D. Extraction system downtime was 40 minutes.
- **February 9, 2018 (planned):** The extraction well system was offline from 10:08 a.m. to 12:40 p.m. to change out microfilter modules due to high transmembrane pressure. Extraction system downtime was 2 hours 32 minutes.
- **February 14, 2018 (unplanned):** The extraction well system was offline from 1:10 a.m. to 1:32 p.m. because the ferrous chloride feed pump (P800) failed and was replaced. Extraction system downtime was 12 hours 22 minutes.
- **February 21, 2018 (unplanned):** The extraction well system was offline from 7:18 a.m. to 7:26 a.m. due to loss of power from the City of Needles. Extraction system downtime was 8 minutes.

- **February 22, 2018 (unplanned):** The extraction well system was offline from 6:26 a.m. to 7:12 a.m. due to variable frequency drive (VFD) motor problems at the Clarifier Feed Pump (P-400). Extraction system downtime was 46 minutes.
- **February 23, 2018 (planned):** The extraction well system was offline from 9:50 a.m. to 9:58 a.m. due to switching between TW-3D and TW-2D to collect a sample at TW-2D. Extraction system downtime was 8 minutes.
- **February 23, 2018 (unplanned):** The extraction well system was offline from 11:02 a.m. to 3:24 a.m. due to the VFD giving erratic output signals that indicated that P-400 had scale buildup. The plant was shut down to remove the scaling. Also, microfilter modules were changed out due to high transmembrane pressure. Extraction system downtime was 4 hours 22 minutes.

## March 2018

During March 2018, extraction well TW-3D operated at a target pump rate of 135 gpm excluding periods of planned and unplanned downtime. Extraction wells TW-2S and TW-2D were not operated during March 2018. Extraction well PE-01 was only operated to collect a sample during March 2018. The operational run time for the IM-3 groundwater extraction system (combined or individual pumping) was 95.7 percent during the March 2018 reporting period.

The IM-3 facility treated approximately 5,765,116 gallons of extracted groundwater during March 2018. The IM-3 facility treated 18,900 gallons of water from injection well backwashing/re-development from Groundwater Partners. Five containers of solids from the IM No. 3 facility were transported offsite during March 2018.

Periods of planned and unplanned extraction system downtime (that together resulted an approximately 4.3 percent downtime during March 2018) are summarized below.

- **March 1, 2018 (unplanned):** The extraction system was offline from 9:54 a.m. to 3:00 p.m. to replace a VFD at the Clarifier Feed Pump (P-400). Extraction system downtime was 5 hours 6 minutes.
- **March 1, 2018 (unplanned):** The extraction well system was offline from 3:58 p.m. to 4:32 p.m. due to a malfunctioning valve controller. The plant was shut down so the operator could reset the controller and the valve. Extraction system downtime was 34 minutes.
- **March 2, 2018 (unplanned):** The extraction system was offline from 4:18 p.m. to 5:40 p.m. to lower the water level in the Raw Water Storage Tank (T-100). Extraction system downtime was 1 hour 22 minutes.
- **March 3, 2018 (unplanned):** The extraction system was offline from 5:14 a.m. to 5:20 a.m. due to a malfunctioning Flow Control Valve (FCV-602), which got stuck in the closed position. The plant was shut down to purge the airline. Extraction system downtime was 6 minutes.
- **March 3, 2018 (unplanned):** The extraction system was offline from 10:14 a.m. to 11:32 a.m. due to a PLC and HMI connectivity issue. Extraction system downtime was 1 hour 18 minutes.
- **March 4, 2018 (unplanned):** The extraction system was offline from 2:48 a.m. to 3:02 a.m. due to a PLC and HMI connectivity issue. Extraction system downtime was 14 minutes.
- **March 4, 2018 (unplanned):** The extraction system was offline from 5:44 a.m. to 7:10 a.m. and from 6:50 p.m. to 7:50 p.m. to lower the water level in the Raw Water Storage Tank (T-100). Extraction system downtime was 2 hour 26 minutes.

- **March 5, 2018 (planned):** The extraction system was offline from 9:50 a.m. to 1:30 p.m. due to testing of the pipeline critical alarms and leak detection system, to change out microfilter modules due to high transmembrane pressure, and to clean out the chromium reduction reactor. Extraction system downtime was 3 hours 40 minutes.
- **March 7, 2018 (unplanned):** The extraction system was offline from 5:34 p.m. to 7:10 p.m. to lower the water level in the Raw Water Storage Tank (T-100). Extraction system downtime was 1 hour 36 minutes.
- **March 8, 2018 (unplanned):** The extraction system was offline from 8:08 a.m. to 12:42 p.m. and from 1:30 p.m. to 2:50 p.m. to change some hand-operated valves between tanks due to scale buildup. Extraction system downtime was 5 hours 54 minutes.
- **March 9, 2018 (unplanned):** The extraction system was offline from 9:38 p.m. to 9:50 p.m. and from 10:02 p.m. to 12:00 am to lower the water level in the Raw Water Storage Tank (T-100). Extraction system downtime was 2 hours 10 minutes.
- **March 10, 2018 (unplanned):** The extraction system was offline from 11:34 a.m. to 1:24 p.m. to clean the pipe between Iron Oxidation Reactor No. 2 (T-301B) and Iron Oxidation Reactor No. 3 (T-301C). Extraction system downtime was 1 hours 50 minutes.
- **March 11, 2018 (unplanned):** The extraction system was offline from 5:38 p.m. to 7:00 p.m. to lower the water level in the Raw Water Storage Tank (T-100). Extraction system downtime was 1 hour 22 minutes.
- **March 16, 2018 (unplanned):** The extraction system was offline from 8:20 a.m. to 9:50 a.m. to lower the water level in the Raw Water Storage Tank (T-100) due to the Raw Water Feed Pump (P-200) shutting off. Extraction system downtime was 1 hours 30 minutes.
- **March 17, 2018 (planned):** The extraction system was offline from 12:02 p.m. to 2:00 p.m. to lower the water level in the Raw Water Storage Tank (T-100) due to receiving injection well backwash water. Extraction system downtime was 1 hours 58 minutes.
- **March 22, 2018 (planned):** The extraction system was offline from 10:06 a.m. to 11:12 a.m. to change out microfilter modules due to high transmembrane pressure. Extraction system downtime was 1 hour 6 minutes.

## April 2018

During April 2018, extraction well TW-3D operated at a target pump rate of 135 gpm excluding periods of planned and unplanned downtime. Extraction wells TW-2S and TW-2D were not operated during April 2018. Extraction well PE-01 was only operated to collect a sample. The operational run time for the IM-3 groundwater extraction system (combined or individual pumping) was 82.4 percent during the April 2018 reporting period.

The IM-3 facility treated approximately 4,819,356 gallons of extracted groundwater during April 2018. The IM-3 facility treated 1,030 gallons of purge water during April 2018. No containers of solids from the IM-3 facility were transported offsite during April 2018.

Periods of planned and unplanned extraction system down time (that together resulted an approximately 17.6 percent downtime during April 2018) are summarized below.

- **April 2 - 6, 2018 (planned):** The extraction well system was offline from 6:36 a.m. on April 2, 2018 to 6:50 a.m. on April 3, 2018; from 7:00 a.m. on April 3, 2018 to 2:02 p.m. on April 6, 2018; and again

from 4:16 p.m. to 5:48 p.m. on April 6, 2018 for semiannual scheduled maintenance. Extraction system downtime was 4 days, 8 hours 48 minutes.

- **April 6-7, 2018 (planned):** The extraction well system was offline from 8:42 p.m. on April 6, 2018 to 4:44 a.m. on April 7, 2018 because the plant was put in recirculation. Extraction system downtime was 8 hours 2 minutes.
- **April 9, 2018 (unplanned):** The extraction well system was offline from 6:48 a.m. to 6:50 a.m. due to a PLC and HMI connectivity issue. Extraction system downtime was 2 minutes.
- **April 9, 2018 (unplanned):** The extraction well system was offline from 7:44 a.m. to 8:14 a.m. to replace a failed pneumatic valve on the microfilter. Extraction system downtime was 30 minutes.
- **April 9, 2018 (unplanned):** The extraction well system was offline from 8:54 a.m. to 12:22 p.m. to maintain appropriate water levels in the Raw Water Storage Tank (T-100). Extraction system downtime was 3 hour 28 minutes.
- **April 11, 2018 (unplanned):** The extraction well system was offline from 1:34 a.m. to 2:20 a.m. to maintain appropriate water levels in T-100. Extraction system downtime was 46 minutes.
- **April 11, 2018 (planned):** The extraction well system was offline from 9:50 a.m. to 10:54 a.m. due to testing of the pipeline critical alarms and leak detection system. Extraction system downtime was 1 hour 4 minutes.
- **April 12, 2018 (unplanned):** The extraction well system was offline from 11:08 a.m. to 12:06 p.m. to change out the microfilter modules due to high transmembrane pressure. The plant was shut down to replace the fouled modules with clean ones. Extraction system downtime was 58 minutes.
- **April 14, 2018 (unplanned):** The extraction well system was offline from 6:06 a.m. to 7:14 a.m. due to the microfilter basket strainer being plugged. The plant was shut down to clean the strainer. Extraction system downtime was 1 hour 8 minutes.
- **April 23, 2018 (unplanned):** The extraction well system was offline from 12:50 p.m. to 2:18 p.m. to change out the microfilter modules due to high transmembrane pressure. The plant was shut down to replace the fouled modules with clean ones. Extraction system downtime was 1 hour 28 minutes.
- **April 24, 2018 (unplanned):** The extraction well system was offline from 10:40 a.m. to 11:42 a.m. to maintain appropriate water levels in T-100. Extraction system downtime was 1 hour 2 minutes.
- **April 30, 2018 (unplanned):** The extraction well system was offline from 7:50 a.m. to 9:58 a.m. to change out the microfilter modules due to high transmembrane pressure. The plant was shut down to replace the fouled modules with clean ones. Extraction system downtime was 2 hours 8 minutes.
- **April 30, 2018 (unplanned):** The extraction well system was offline from 2:38 p.m. to 3:44 p.m. to maintain appropriate water levels in T-100. Extraction system downtime was 1 hour 6 minutes.

## May 2018

During May 2018, extraction well TW-3D operated at a target pump rate of 135 gpm excluding periods of planned and unplanned downtime. Extraction well TW-2S was not operated during May 2018. Extraction wells TW-2D and PE-01 were only operated to collect a sample. The operational run time for the IM-3 groundwater extraction system (combined or individual pumping) was 95.5 percent during the May 2018 reporting period.

The IM-3 facility treated approximately 5,756,326 gallons of extracted groundwater during May 2018. The IM-3 facility treated 1,660 gallons of purge water during May 2018. No containers of solids from the IM-3 facility were transported offsite during May 2018.

Periods of planned and unplanned extraction system down time (that together resulted an approximately 4.5 percent downtime during May 2018) are summarized below.

- **May 5, 2018 (unplanned):** The extraction well system was offline from 3:22 p.m. to 4:26 p.m. to maintain appropriate water levels in the Raw Water Storage Tank (T-100). Extraction system downtime was 1 hour 4 minutes.
- **May 7, 2018 (unplanned):** The extraction well system was offline from 1:02 a.m. to 9:14 a.m. due to replacing a failed pneumatic valve on the microfilter. Extraction system downtime was 8 hours 12 minutes.
- **May 9-10, 2018 (unplanned):** The extraction well system was offline from 11:36 p.m. on May 9, 2018 to 1:34 a.m. on May 10, 2018 because a check valve on the microfilter failed due to scaling. It was cleaned and placed back into service. Extraction system downtime was 1 hour 58 minutes.
- **May 10, 2018 (unplanned):** The extraction well system was offline from 3:24 p.m. to 4:10 p.m. due to the microfilter basket strainer being plugged. The plant was shut down to clean the strainer. Extraction system downtime was 46 minutes.
- **May 13, 2018 (unplanned):** The extraction well system was offline from 4:04 p.m. to 5:16 p.m. to maintain appropriate water levels in T-100. Extraction system downtime was 1 hour 12 minutes.
- **May 14-15, 2018 (unplanned):** The extraction well system was offline from 11:58 p.m. on May 14, 2018 to 12:54 a.m. on May 15, 2018 to maintain appropriate water levels in T-100. Extraction system downtime was 56 minutes.
- **May 16, 2018 (unplanned):** The extraction well system was offline from 4:08 a.m. to 5:26 a.m. to maintain appropriate water levels in T-100. Extraction system downtime was 1 hour 18 minutes.
- **May 16, 2018 (unplanned):** The extraction well system was offline from 10:14 a.m. to 11:02 a.m. to change out the microfilter modules on the west side due to high transmembrane pressure. Extraction system downtime was 48 minutes.
- **May 17, 2018 (planned and unplanned):** The extraction well system was offline from 7:14 a.m. to 2:48 p.m. due to testing of the pipeline critical alarms and leak detection system and also to clean a blockage in the pipe causing a high level at the Iron Oxidation Reactor (T-301) tank. Extraction system downtime was 7 hours 34 minutes.
- **May 22, 2018 (unplanned):** The extraction well system was offline from 5:28 p.m. to 5:58 p.m. due to loss of power from the City of Needles. Extraction system downtime was 30 minutes.
- **May 23, 2018 (unplanned):** The extraction well system was offline from 6:58 a.m. to 12:00 p.m. to clean off sludge from the Clarifier and fix a leaking seal at the Chemical Mixing Pump (P-200). Extraction system downtime was 5 hour 2 minutes.
- **May 26, 2018 (unplanned):** The extraction well system was offline from 4:06 p.m. to 4:20 p.m. to maintain appropriate water levels in T-100. Extraction system downtime was 14 minutes.
- **May 27, 2018 (unplanned):** The extraction well system was offline from 12:24 a.m. to 1:28 a.m. to maintain appropriate water levels in T-100 and to clean the microfilter strainer. Extraction system downtime was 1 hour 4 minutes.

- **May 31, 2018 (unplanned):** The extraction well system was offline from 8:02 a.m. to 10:58 a.m. to change out the microfilter modules due to high transmembrane pressure and to change out the reverse osmosis pre-filters. Extraction system downtime was 2 hours 56 minutes.

## June 2018

During June 2018, extraction well TW-3D operated at a target pump rate of 135 gpm excluding periods of planned and unplanned downtime. Extraction wells TW-2D and TW-2S were not operated during June 2018. Extraction well PE-01 was only operated to collect a sample. The operational run time for the IM-3 groundwater extraction system (combined or individual pumping) was 88.1 percent during the June 2018 reporting period.

The IM-3 facility treated approximately 5,140,983 gallons of extracted groundwater during June 2018. The IM-3 facility treated 360 gallons of purge water during June 2018. Three containers of solids from the IM-3 facility were transported offsite during June 2018.

Periods of planned and unplanned extraction system down time (that together resulted an approximately 11.9 percent downtime during June 2018) are summarized below.

- **June 8, 2018 (planned and unplanned):** The extraction well system was offline from 12:42 p.m. to 12:58 p.m. due to testing of the pipeline critical alarms and leak detection system and due to a high level in Iron Oxidation Reactor (T-301) tank including investigating the cause. Extraction system downtime was 16 minutes.
- **June 12, 2018 (unplanned):** The extraction well system was offline from 6:12 a.m. to 7:46 a.m. due to loss of power from the City of Needles. Extraction system downtime was 1 hour 34 minutes.
- **June 13, 2018 (unplanned):** The extraction well system was offline from 10:54 a.m. to 11:56 a.m. to maintain appropriate water levels in T-100. Extraction system downtime was 1 hour 2 minutes.
- **June 14, 2018 (planned and unplanned):** The extraction well system was offline from 3:10 a.m. to 1:10 p.m. due to a high level in T-301 and investigating the cause. Operators cleaned a blockage in the piping between the oxidation tanks. Extraction system downtime was 10 hours.
- **June 16, 2018 (unplanned):** The extraction well system was offline from 8:28 a.m. to 9:32 a.m. to change out the microfilter modules due to high transmembrane pressure. Extraction system downtime was 1 hour 4 minutes.
- **June 17, 2018 (unplanned):** The extraction well system was offline from 4:46 p.m. to 6:00 p.m. to maintain appropriate water levels in T-100. Extraction system downtime was 1 hour 14 minutes.
- **June 18 - 20, 2018 (unplanned):** The extraction well system was offline from 6:16 p.m. on June 18, 2018 to 6:40 p.m. on June 19, 2018 and from 9:50 p.m. on June 19, 2018 to 10:16 a.m. on June 20, 2018 due to a bad batch of ferrous chloride chemical that resulted in poor conversion of hexavalent chromium to trivalent chromium. This required the plant to be set in recirculation mode to troubleshoot the cause. Once the cause was determined, the ferrous chloride was replaced. The bad batch also resulted in excess solids that flocculated poorly and accumulated in the piping, the tanks between the pipe reactor, the clarifier, the microfilters, and the Pre-Treated Water Tank (T-500). A power outage also occurred during this shutdown. Some of the accumulated solids were removed from the equipment. Later plant outages in June were caused by this situation. Extraction system downtime was 1 day 12 hours 50 minutes.
- **June 21, 2018 (unplanned):** The extraction well system was offline from 4:04 p.m. to 4:36 p.m. to maintain appropriate water levels in T-100. Extraction system downtime was 32 minutes.

- **June 24, 2018 (unplanned):** The extraction well system was offline from 1:36 p.m. to 2:30 p.m. to maintain appropriate water levels in T-100. Extraction system downtime was 54 minutes.
- **June 26, 2018 (unplanned):** The extraction well system was offline from 11:14 p.m. to 11:38 p.m. to change out the microfilter modules due to high transmembrane pressure. Extraction system downtime was 24 minutes.
- **June 27, 2018 (unplanned):** The extraction well system was offline from 12:18 a.m. to 12:36 a.m. because the seal water line failed on the Raw Water Feed Pump (P-200). Extraction system downtime was 18 minutes.
- **June 27, 2018 (unplanned):** The extraction well system was offline from 1:04 a.m. to 2:04 a.m. to maintain appropriate water levels in T-100. Extraction system downtime was 1 hour.
- **June 28 - 29, 2018 (unplanned):** The extraction well system was offline from 12:22 p.m. on June 28, 2018 to 2:58 a.m. on June 29, 2018 to change out the microfilter modules due to high transmembrane pressure. Extraction system downtime was 14 hours 36 minutes.
- **June 29, 2018 (unplanned):** The extraction well system was offline from 4:04 a.m. to 7:04 p.m. to change out the microfilter modules due to high transmembrane pressure. Extraction system downtime was 15 hours.
- **June 30, 2018 (unplanned):** The extraction well system was offline from 2:24 p.m. to 3:08 p.m. due to P-200 shutting off and to maintain appropriate water levels in T-100. Extraction system downtime was 44 minutes.

Appendix B  
Daily Volumes of Groundwater  
Treated



**January 2018 Operational Data**  
IM-3 Groundwater Extraction and Treatment System  
PG&E Topock Compressor Station, Needles, California

Extraction Well System							Injection Well System			RO Brine	
Month	Day	Year	TW-2S (gallons)	TW-2D (gallons)	TW-3D (gallons)	PE-1 (gallons)	Total (gallons)	IW-02 (gallons)	IW-03 (gallons)	Total (gallons)	(gallons)
January	1	2018	--	--	191,465	0	191,465	0	192,896	192,896	0
January	2	2018	--	--	193,936	0	193,936	0	191,002	191,002	0
January	3	2018	--	--	169,967	0	169,967	0	177,938	177,938	3,673
January	4	2018	--	38	193,238	530	193,806	0	192,235	192,235	0
January	5	2018	--	--	194,199	0	194,199	0	192,591	192,591	0
January	6	2018	--	--	195,979	0	195,979	0	192,529	192,529	3,743
January	7	2018	--	--	195,810	0	195,810	0	192,745	192,745	0
January	8	2018	--	--	195,853	0	195,853	0	194,695	194,695	0
January	9	2018	--	--	177,759	0	177,759	0	184,664	184,664	0
January	10	2018	--	--	196,102	0	196,102	0	196,376	196,376	4,348
January	11	2018	--	--	195,788	0	195,788	0	195,427	195,427	0
January	12	2018	--	--	195,482	0	195,482	0	195,755	195,755	3,606
January	13	2018	--	--	182,545	0	182,545	0	195,113	195,113	0
January	14	2018	--	--	195,449	0	195,449	0	187,462	187,462	0
January	15	2018	--	--	195,215	0	195,215	0	194,803	194,803	0
January	16	2018	--	--	192,382	0	192,382	0	194,912	194,912	3,776
January	17	2018	--	--	195,084	0	195,084	0	194,866	194,866	0
January	18	2018	--	--	194,929	0	194,929	0	194,561	194,561	0
January	19	2018	--	--	180,887	0	180,887	0	185,161	185,161	3,896
January	20	2018	--	--	195,072	0	195,072	0	195,180	195,180	0
January	21	2018	--	--	195,064	0	195,064	0	195,459	195,459	0
January	22	2018	--	--	183,378	0	183,378	0	194,709	194,709	3,925
January	23	2018	--	--	195,346	0	195,346	0	189,506	189,506	0
January	24	2018	--	--	186,731	0	186,731	0	192,574	192,574	3,750
January	25	2018	--	--	195,386	0	195,386	0	192,590	192,590	0
January	26	2018	--	--	195,278	0	195,278	0	192,711	192,711	3,751
January	27	2018	--	--	195,355	0	195,355	0	193,682	193,682	0
January	28	2018	--	--	195,527	0	195,527	0	197,171	197,171	0
January	29	2018	--	--	195,416	0	195,416	0	197,634	197,634	3,683
January	30	2018	--	--	189,836	0	189,836	0	197,038	197,038	0
January	31	2018	--	--	195,604	0	195,604	0	188,918	188,918	3,837
Total Monthly Volumes (gallons)			0	38	5,950,063	530	5,950,632	0	5,972,906	5,972,906	41,986
Average Pump/Injection Rates (gpm)			0.0	0.0	133.3	0.0	133.3	0.0	133.8	133.8	0.9

NOTES: gpm: gallons per minute RO: Reverse Osmosis

- Extraction wells TW-3D and PE-1 were operated during January 2018 at a target pump rate of 135 gpm excluding periods of planned and unplanned downtime. Extraction well TW-2S was not operated during January 2018.
- Effluent was discharged into injection well IW-03.
- The difference between influent flow rate and the sum of the effluent and reverse osmosis concentrate flow rates during January 2018 is approximately 1.08 percent. This percentage difference includes instrument noise in the system, but is within the accuracy of the flow meters. A well is considered to be offline if the daily reported flow is 140 gallons per day or less.

**February 2018 Operational Data**

IM-3 Groundwater Extraction and Treatment System

PG&amp;E Topock Compressor Station, Needles, California

			Extraction Well System					Injection Well System			RO Brine
Month	Day	Year	TW-2S (gallons)	TW-2D (gallons)	TW-3D (gallons)	PE-1 (gallons)	Total (gallons)	IW-02 (gallons)	IW-03 (gallons)	Total (gallons)	(gallons)
February	1	2018	--	--	186,829	0	186,829	0	186,441	186,441	0
February	2	2018	--	--	192,731	0	192,731	0	195,255	195,255	3,893
February	3	2018	--	--	196,250	0	196,250	0	194,880	194,880	0
February	4	2018	--	--	196,062	0	196,062	0	194,056	194,056	3,893
February	5	2018	--	--	195,846	0	195,846	0	190,403	190,403	3,820
February	6	2018	--	--	190,160	0	190,160	0	193,257	193,257	0
February	7	2018	--	--	194,989	477	195,467	0	197,604	197,604	3,702
February	8	2018	--	--	194,753	0	194,753	0	193,500	193,500	1,387
February	9	2018	--	--	174,136	0	174,136	0	178,867	178,867	0
February	10	2018	--	--	194,976	0	194,976	0	192,942	192,942	3,848
February	11	2018	--	--	194,850	0	194,850	0	194,813	194,813	0
February	12	2018	--	--	194,716	0	194,716	0	194,554	194,554	3,753
February	13	2018	--	--	194,357	0	194,357	0	195,240	195,240	0
February	14	2018	--	--	94,215	0	94,215	0	98,367	98,367	0
February	15	2018	--	--	194,561	0	194,561	0	195,241	195,241	0
February	16	2018	--	--	194,309	0	194,309	0	194,389	194,389	0
February	17	2018	--	--	194,385	0	194,385	0	194,477	194,477	6,047
February	18	2018	--	--	194,529	0	194,529	0	194,425	194,425	0
February	19	2018	--	--	194,608	0	194,608	0	189,205	189,205	3,956
February	20	2018	--	--	194,618	0	194,618	0	196,342	196,342	0
February	21	2018	--	--	193,539	0	193,539	0	195,523	195,523	3,991
February	22	2018	--	--	188,705	0	188,705	0	187,498	187,498	0
February	23	2018	--	36	158,908	0	158,944	0	156,563	156,563	0
February	24	2018	--	--	195,341	0	195,341	0	197,079	197,079	3,806
February	25	2018	--	--	194,397	0	194,397	0	196,828	196,828	0
February	26	2018	--	--	194,387	0	194,387	0	195,832	195,832	3,797
February	27	2018	--	--	194,269	0	194,269	0	196,348	196,348	0
February	28	2018	--	--	194,188	0	194,188	0	196,269	196,269	3,986
<b>Total Monthly Volumes (gallons)</b>			<b>0</b>	<b>36</b>	<b>5,275,611</b>	<b>477</b>	<b>5,276,125</b>	<b>0</b>	<b>5,286,197</b>	<b>5,286,197</b>	<b>49,880</b>
<b>Average Pump/Injection Rates (gpm)</b>			<b>0.0</b>	<b>0.0</b>	<b>130.8</b>	<b>0.0</b>	<b>130.9</b>	<b>0.0</b>	<b>131.1</b>	<b>131.1</b>	<b>1.2</b>

NOTES: gpm: gallons per minute RO: Reverse Osmosis

- Extraction wells TW-3D and PE-1 were operated during February 2018 at a target pump rate of 135 gpm excluding periods of planned and unplanned downtime. Extraction well TW-2S was not operated during February 2018.
- Effluent was discharged into injection well IW-03.
- The difference between influent flow rate and the sum of the effluent and reverse osmosis concentrate flow rates during February 2018 is approximately 1.14 percent. This percentage difference includes instrument noise in the system, but is within the accuracy of the flow meters. A well is considered to be offline if the daily reported flow is 140 gallons per day or less.

**March 2018 Operational Data**

IM-3 Groundwater Extraction and Treatment System

PG&amp;E Topock Compressor Station, Needles, California

Month	Day	Year	Extraction Well System					Injection Well System			RO Brine
			TW-2S (gallons)	TW-2D (gallons)	TW-3D (gallons)	PE-1 (gallons)	Total (gallons)	IW-02 (gallons)	IW-03 (gallons)	Total (gallons)	
March	1	2018	--	--	148,227	0	148,227	0	145,252	145,252	0
March	2	2018	--	--	183,426	0	183,426	0	182,556	182,556	0
March	3	2018	--	--	183,137	0	183,137	0	180,796	180,796	3,941
March	4	2018	--	--	172,683	0	172,683	0	184,131	184,131	0
March	5	2018	--	--	164,727	0	164,727	0	157,132	157,132	3,989
March	6	2018	--	--	194,499	0	194,499	0	187,903	187,903	0
March	7	2018	--	--	179,672	285	179,957	0	190,925	190,925	3,977
March	8	2018	--	--	146,559	0	146,559	0	140,258	140,258	0
March	9	2018	--	--	176,981	0	176,981	0	184,980	184,980	0
March	10	2018	--	--	179,700	0	179,700	0	169,781	169,781	3,868
March	11	2018	--	--	183,631	0	183,631	0	186,968	186,968	0
March	12	2018	--	--	194,857	0	194,857	0	190,066	190,066	0
March	13	2018	--	--	194,928	0	194,928	0	196,127	196,127	4,392
March	14	2018	--	--	194,835	0	194,835	0	195,599	195,599	0
March	15	2018	--	--	194,736	0	194,736	91,028	105,296	196,325	3,827
March	16	2018	--	--	182,423	0	182,423	111,075	72,050	183,125	0
March	17	2018	--	--	178,671	0	178,671	55,244	141,593	196,836	0
March	18	2018	--	--	194,817	0	194,817	198,887	0	198,887	4,040
March	19	2018	--	--	194,716	0	194,716	198,652	0	198,652	0
March	20	2018	--	--	194,565	0	194,565	197,458	0	197,458	4,081
March	21	2018	--	--	194,262	0	194,262	197,493	0	197,493	0
March	22	2018	--	--	185,027	0	185,027	188,638	0	188,638	4,020
March	23	2018	--	--	194,110	0	194,110	195,264	0	195,264	0
March	24	2018	--	--	194,528	0	194,528	189,713	0	189,713	0
March	25	2018	--	--	194,574	0	194,574	193,243	0	193,243	4,010
March	26	2018	--	--	194,404	0	194,404	196,327	0	196,327	0
March	27	2018	--	--	194,260	0	194,260	196,316	0	196,316	0
March	28	2018	--	--	194,090	0	194,090	196,385	0	196,385	3,589
March	29	2018	--	--	194,079	0	194,079	195,358	0	195,358	0
March	30	2018	--	--	193,877	0	193,877	196,141	0	196,141	3,862
March	31	2018	--	--	193,830	0	193,830	188,188	0	188,188	0
<b>Total Monthly Volumes (gallons)</b>			<b>0</b>	<b>0</b>	<b>5,764,831</b>	<b>285</b>	<b>5,765,116</b>	<b>2,985,410</b>	<b>2,811,414</b>	<b>5,796,824</b>	<b>47,596</b>
<b>Average Pump/Injection Rates (gpm)</b>			<b>0.0</b>	<b>0.0</b>	<b>129.1</b>	<b>0.0</b>	<b>129.1</b>	<b>66.9</b>	<b>63.0</b>	<b>129.9</b>	<b>1.1</b>

NOTES: gpm: gallons per minute RO: Reverse Osmosis

- Extraction wells TW-3D and PE-1 were operated during March 2018 at a target pump rate of 135 gpm excluding periods of planned and unplanned downtime. Extraction wells TW-2D and TW-2S were not operated during March 2018.
- Effluent was discharged into injection wells IW-02 and IW-03.
- The difference between influent flow rate and the sum of the effluent and reverse osmosis concentrate flow rates during March 2018 is approximately 1.38 percent. This percentage difference includes instrument noise in the system, but is within the accuracy of the flow meters. A well is considered to be offline if the daily reported flow is 140 gallons per day or less.

# **April 2018 Operational Data**

IM-3 Groundwater Extraction and Treatment System

PG&E Topock Compressor Station, Needles, California

Month	Day	Year	Extraction Well System					Injection Well System			RO Brine
			TW-2S (gallons)	TW-2D (gallons)	TW-3D (gallons)	PE-1 (gallons)	Total (gallons)	IW-02 (gallons)	IW-03 (gallons)	Total (gallons)	
April	1	2018	--	--	193,956	0	193,956	191,984	0	191,984	0
April	2	2018	--	--	53,407	0	53,407	55,065	0	55,065	0
April	3	2018	--	--	1,251	183	1,433	0	0	0	0
April	4	2018	--	--	0	0	0	0	0	0	0
April	5	2018	--	--	0	0	0	0	0	0	0
April	6	2018	--	--	41,558	0	41,558	20,998	0	20,998	3,748
April	7	2018	--	--	156,963	0	156,963	152,402	0	152,402	0
April	8	2018	--	--	195,986	0	195,986	197,140	0	197,140	3,582
April	9	2018	--	--	163,321	0	163,321	160,373	0	160,373	0
April	10	2018	--	--	196,154	0	196,154	188,128	0	188,128	3,962
April	11	2018	--	--	189,708	0	189,708	189,428	0	189,428	0
April	12	2018	--	--	178,776	0	178,776	175,889	0	175,889	3,993
April	13	2018	--	--	194,820	0	194,820	193,497	0	193,497	0
April	14	2018	--	--	185,721	0	185,721	192,169	0	192,169	0
April	15	2018	--	--	195,066	0	195,066	192,862	0	192,862	3,949
April	16	2018	--	--	195,116	0	195,116	196,356	0	196,356	0
April	17	2018	--	--	195,155	0	195,155	198,632	0	198,632	497
April	18	2018	--	--	195,158	0	195,158	198,340	0	198,340	3,316
April	19	2018	--	--	195,073	0	195,073	197,760	0	197,760	0
April	20	2018	--	--	194,780	0	194,780	190,865	0	190,865	3,937
April	21	2018	--	--	194,526	0	194,526	193,447	0	193,447	0
April	22	2018	--	--	194,513	0	194,513	194,128	0	194,128	0
April	23	2018	--	--	182,457	0	182,457	179,560	0	179,560	4,008
April	24	2018	--	--	186,081	0	186,081	188,194	0	188,194	0
April	25	2018	--	--	194,413	0	194,413	196,549	0	196,549	0
April	26	2018	--	--	194,291	0	194,291	196,054	0	196,054	3,821
April	27	2018	--	--	194,281	0	194,281	197,207	0	197,207	0
April	28	2018	--	--	194,157	0	194,157	199,533	0	199,533	0
April	29	2018	--	--	194,263	0	194,263	198,970	0	198,970	3,836
April	30	2018	--	--	168,222	0	168,222	157,057	0	157,057	0
<b>Total Monthly Volumes (gallons)</b>			<b>0</b>	<b>0</b>	<b>4,819,173</b>	<b>183</b>	<b>4,819,356</b>	<b>4,792,588</b>	<b>0</b>	<b>4,792,588</b>	<b>38,649</b>
<b>Average Pump/Injection Rates (gpm)</b>			<b>0.0</b>	<b>0.0</b>	<b>111.6</b>	<b>0.0</b>	<b>111.6</b>	<b>110.9</b>	<b>0.0</b>	<b>110.9</b>	<b>0.9</b>

NOTES: gpm: gallons per minute RO: Reverse Osmosis

- Extraction wells TW-3D and PE-1 were operated during April 2018 at a target pump rate of 135 gpm excluding periods of planned and unplanned downtime. Extraction wells TW-2D and TW-2S were not operated during April 2018.
- Effluent was discharged into injection well IW-02.
- The difference between influent flow rate and the sum of the effluent and reverse osmosis concentrate flow rates during April 2018 is approximately 0.25 percent. This percentage difference includes instrument noise in the system, but is within the accuracy of the flow meters. A well is considered to be offline if the daily reported flow is 140 gallons per day or less.

# May 2018 Operational Data

IM-3 Groundwater Extraction and Treatment System

PG&E Topock Compressor Station, Needles, California

			Extraction Well System					Injection Well System			RO Brine
Month	Day	Year	TW-2S (gallons)	TW-2D (gallons)	TW-3D (gallons)	PE-1 (gallons)	Total (gallons)	IW-02 (gallons)	IW-03 (gallons)	Total (gallons)	(gallons)
May	1	2018	--	--	194,541	0	194,541	197,618	0	197,618	0
May	2	2018	--	--	194,407	0	194,407	194,857	0	194,857	3,807
May	3	2018	--	--	194,174	0	194,174	192,436	0	192,436	0
May	4	2018	--	42	193,719	298	194,058	196,648	0	196,648	0
May	5	2018	--	--	185,012	0	185,012	196,425	66	196,491	0
May	6	2018	--	--	193,860	0	193,860	196,366	0	196,366	3,838
May	7	2018	--	--	127,881	0	127,881	10,916	122,729	133,644	0
May	8	2018	--	--	194,274	0	194,274	0	195,345	195,345	0
May	9	2018	--	--	190,866	0	190,866	0	184,016	184,016	0
May	10	2018	--	--	175,132	0	175,132	0	184,061	184,061	4,015
May	11	2018	--	--	194,125	0	194,125	0	193,108	193,108	0
May	12	2018	--	--	194,000	0	194,000	0	191,675	191,675	436
May	13	2018	--	--	184,414	0	184,414	0	189,716	189,716	3,542
May	14	2018	--	--	194,246	0	194,246	0	193,366	193,366	0
May	15	2018	--	--	187,358	0	187,358	0	187,453	187,453	0
May	16	2018	--	--	177,617	0	177,617	0	185,689	185,689	4,015
May	17	2018	--	--	133,617	0	133,617	0	127,960	127,960	0
May	18	2018	--	--	195,136	0	195,136	0	196,948	196,948	0
May	19	2018	--	--	194,842	0	194,842	0	195,184	195,184	4,028
May	20	2018	--	--	194,848	0	194,848	0	195,233	195,233	0
May	21	2018	--	--	194,859	0	194,859	0	196,800	196,800	0
May	22	2018	--	--	190,833	0	190,833	0	197,363	197,363	3,828
May	23	2018	--	--	154,161	0	154,161	0	148,118	148,118	0
May	24	2018	--	--	194,889	0	194,889	0	194,972	194,972	0
May	25	2018	--	--	194,532	0	194,532	0	194,723	194,723	4,010
May	26	2018	--	--	192,539	0	192,539	0	190,958	190,958	0
May	27	2018	--	--	185,661	0	185,661	0	192,898	192,898	0
May	28	2018	--	--	194,492	0	194,492	0	198,635	198,635	0
May	29	2018	--	--	194,515	0	194,515	0	196,371	196,371	3,934
May	30	2018	--	--	194,533	0	194,533	0	192,019	192,019	0
May	31	2018	--	--	170,905	0	170,905	0	170,673	170,673	0
<b>Total Monthly Volumes (gallons)</b>			<b>0</b>	<b>42</b>	<b>5,755,987</b>	<b>298</b>	<b>5,756,326</b>	<b>1,185,266</b>	<b>4,616,079</b>	<b>5,801,344</b>	<b>35,453</b>
<b>Average Pump/Injection Rates (gpm)</b>			<b>0.0</b>	<b>0.0</b>	<b>128.9</b>	<b>0.0</b>	<b>128.9</b>	<b>26.6</b>	<b>103.4</b>	<b>130.0</b>	<b>0.8</b>

NOTES: gpm: gallons per minute RO: Reverse Osmosis

- Extraction wells TW-3D and PE-1 were operated during May 2018 at a target pump rate of 135 gpm excluding periods of planned and unplanned downtime. Extraction well TW-2S was not operated during May 2018.
- Effluent was discharged into injection wells IW-02 and IW-03.
- The difference between influent flow rate and the sum of the effluent and reverse osmosis concentrate flow rates during May 2018 is approximately 1.4 percent. This percentage difference includes instrument noise in the system, but is within the accuracy of the flow meters. A well is considered to be offline if the daily reported flow is 140 gallons per day or less.

# June 2018 Operational Data

IM-3 Groundwater Extraction and Treatment System

PG&E Topock Compressor Station, Needles, California

			Extraction Well System					Injection Well System			RO Brine
Month	Day	Year	TW-2S (gallons)	TW-2D (gallons)	TW-3D (gallons)	PE-1 (gallons)	Total (gallons)	IW-02 (gallons)	IW-03 (gallons)	Total (gallons)	(gallons)
June	1	2018	--	--	194,529	0	194,529	0	193,997	193,997	0
June	2	2018	--	--	194,176	0	194,176	0	193,385	193,385	3,089
June	3	2018	--	--	194,230	0	194,230	0	194,285	194,285	0
June	4	2018	--	--	194,091	0	194,091	0	197,096	197,096	0
June	5	2018	--	--	193,974	0	193,974	0	197,010	197,010	2,807
June	6	2018	--	--	193,846	0	193,846	0	197,050	197,050	0
June	7	2018	--	--	193,755	367	194,122	0	196,817	196,817	0
June	8	2018	--	--	191,786	0	191,786	0	196,817	196,817	0
June	9	2018	--	--	193,936	0	193,936	0	188,346	188,346	0
June	10	2018	--	--	194,059	0	194,059	0	195,390	195,390	3,881
June	11	2018	--	--	194,039	0	194,039	0	194,962	194,962	0
June	12	2018	--	--	181,722	0	181,722	0	185,012	185,012	0
June	13	2018	--	--	186,252	0	186,252	0	189,485	189,485	0
June	14	2018	--	--	113,798	0	113,798	0	111,115	111,115	0
June	15	2018	--	--	195,085	0	195,085	0	196,005	196,005	0
June	16	2018	--	--	186,268	0	186,268	0	186,691	186,691	3,968
June	17	2018	--	--	185,030	0	185,030	0	191,597	191,597	0
June	18	2018	--	--	148,532	0	148,532	0	147,272	147,272	0
June	19	2018	--	--	25,744	0	25,744	0	27,467	27,467	0
June	20	2018	--	--	111,729	0	111,729	0	97,310	97,310	0
June	21	2018	--	--	190,805	0	190,805	0	193,787	193,787	0
June	22	2018	--	--	194,690	0	194,690	0	200,440	200,440	5,819
June	23	2018	--	--	194,484	0	194,484	0	188,612	188,612	0
June	24	2018	--	--	187,228	0	187,228	0	196,724	196,724	0
June	25	2018	--	--	194,548	0	194,548	0	193,533	193,533	0
June	26	2018	--	--	191,023	0	191,023	0	191,852	191,852	0
June	27	2018	--	--	183,474	0	183,474	0	189,410	189,410	3,844
June	28	2018	--	--	100,075	0	100,075	0	101,347	101,347	0
June	29	2018	--	--	48,919	0	48,919	0	41,069	41,069	0
June	30	2018	--	--	188,791	0	188,791	0	189,306	189,306	0
<b>Total Monthly Volumes (gallons)</b>			<b>0</b>	<b>0</b>	<b>5,140,616</b>	<b>367</b>	<b>5,140,983</b>	<b>0</b>	<b>5,163,189</b>	<b>5,163,189</b>	<b>23,408</b>
<b>Average Pump/Injection Rates (gpm)</b>			<b>0.0</b>	<b>0.0</b>	<b>119.0</b>	<b>0.0</b>	<b>119.0</b>	<b>0.0</b>	<b>119.5</b>	<b>119.5</b>	<b>0.5</b>

NOTES: gpm: gallons per minute RO: Reverse Osmosis

- Extraction wells TW-3D and PE-1 were operated during June 2018 at a target pump rate of 135 gpm excluding periods of planned and unplanned downtime. Extraction wells TW-2D and TW-2S were not operated during June 2018.
- Effluent was discharged into injection well IW-03.
- The difference between influent flow rate and the sum of the effluent and reverse osmosis concentrate flow rates during June 2018 is approximately 0.89 percent. This percentage difference includes instrument noise in the system, but is within the accuracy of the flow meters. A well is considered to be offline if the daily reported flow is 140 gallons per day or less.

## Appendix C

### Flowmeter Calibration Records

Endress+Hauser 

People for Process Automation

## Flow Calibration without Adjustment

92000404-1275100

WWRA017112F

Purchase order number

US-3601532757-100 / Endress+Hauser Inc.

Order N°/Manufacturer

23P50-AL1A1RA022AW

Order code

PROMAG 23 P 2"

Transmitter/Sensor

6A021F16000

Serial N°

FIT-100

Tag N°

FCP-8.2 US

Calibration rig

155 us.gal/min

(  $\pm 100\%$  )

Calibrated full scale

Current 4 - 20 mA

Calibrated output

0.9159

Calibration factor

-17

Zero point

76.5 °F

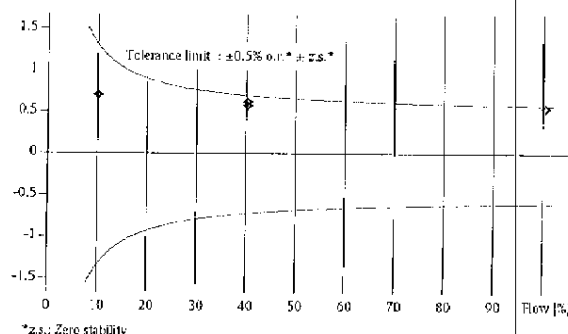
Water temperature

Flow [%]	Flow [us.gal/min]	Duration [sec]	V target [us.gal]	V meas. [us.gal]	$\Delta$ o.r.* [%]	Outp.** [mA]
10.0	15.496	60.0	15.507	15.616	0.70	5.61
40.1	62.217	60.1	62.277	62.664	0.62	10.46
40.2	62.237	60.0	62.285	62.643	0.58	10.46
100.4	155.557	60.0	155.665	156.522	0.55	20.15
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

\*o.r.: of rate

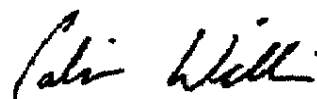
\*\*Calculated value (4-20 mA)

Measured error % o.r.



For detailed data concerning output specifications of the unit under test, see Technical Information (TI), chapter Performance characteristics.  
Traceability to the national standard for all test instruments used for the calibration is guaranteed.

Endress+Hauser Flowtec operates ISO/IEC 17025 accredited calibration facilities in Reinach (CH), Cernay (FR), Greenwood (USA), Aurangabad (IN) and Suzhou (CN).



Calvin Williams  
Operator

09-16-2015

Date of calibration

Endress+Hauser Inc.  
10057 Porter Road  
La Porte, Texas 77571



**Endress+Hauser**   
People for Process Automation

## Flow Calibration with Adjustment

92009500-1304707

WWRA017112F

Purchase order number

US-3601532757-200 / Endress+Hauser Inc.

Order N°/Manufacturer

23P50-AL1A1AA022AW

Order code

PROMAG 23 P 2"

Transmitter/Sensor

6C037116000

Serial N°

-

Tag N°

FCP-8.2 US

Calibration rig

156 us.gal/min ( $\pm 100\%$ )

Calibrated full scale

Current 4 - 20 mA

Calibrated output

0.9164

Calibration factor

5

Zero point

77 °F

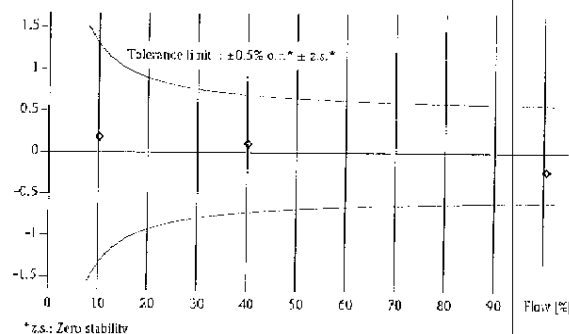
Water temperature

Flow [%]	Flow [us.gal/min]	Duration [sec]	V target [us.gal]	V mens. [us.gal]	$\Delta$ p.p.* [%]	Outp.** [mA]
10.0	15.575	60.1	15.590	15.620	0.19	5.60
40.0	62.448	60.1	62.513	62.585	0.11	10.41
40.0	62.468	60.0	62.512	62.583	0.11	10.41
100.4	156.636	60.1	156.798	156.474	-0.21	20.03
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

\*o.p.: of rate

\*\*Calculated value [4 - 20 mA]

Measured error % o.r.



For detailed data concerning output: specifications of the unit under test, see Technical Information (TI), chapter Performance characteristics.  
Traceability to the national standard for all test instruments used for the calibration is guaranteed.

Endress+Hauser Flowtec operates ISO/IEC 17025 accredited calibration facilities in Reinach (CH), Cernay (FR), Greenwood (USA), Aurangabad (IN) and Suzhou (CN).

*Calvin Williams*

09-17-2015

Date of calibration

Endress+Hauser Inc.  
16057 Porter Road  
La Porte, Texas 77571

Calvin Williams  
Operator

## Flow Calibration without Adjustment

92010359-1304705

WWRA-017895-F

Purchase order number

US-3601533868-100 / Endress+Hauser Inc.

Order N°/Manufacturer

23P50-AL1A1AA022AW

Order code

PROMAG 23 P 2"

Transmitter/Sensor

6C036F16000

Serial N°

FIT-1201

Tag N°

FCP-7.1.6 US

Calibration rig

155.6102 us.gal/min ( $\pm 100\%$ )

Calibrated full scale

Current 4 - 20 mA

Calibrated output

0.9101

Calibration factor

-34

Zero point

70.4 °F

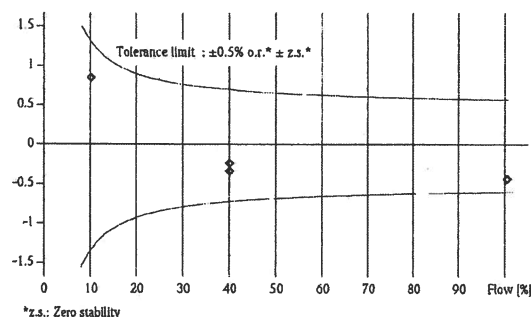
Water temperature

Flow [%]	Flow [us.gal/min]	Duration [sec]	V target [us.gal]	V meas. [us.gal]	$\Delta$ o.r.* [%]	Outp.** [mA]
9.9	15.450	60.2	15.502	15.635	0.85	5.60
39.9	62.130	60.2	62.334	62.134	-0.32	10.37
39.9	62.139	60.2	62.352	62.214	-0.22	10.38
100.4	156.155	60.2	156.670	156.016	-0.42	19.99
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

\*o.r.: of rate

\*\*Calculated value (4 - 20 mA)

Measured error % o.r.



For detailed data concerning output specifications of the unit under test, see Technical Information (TI), chapter Performance characteristics.  
Traceability to the national standard for all test instruments used for the calibration is guaranteed.

Endress+Hauser Flowtec operates ISO/IEC 17025 accredited calibration facilities in Reinach (CH), Cernay (FR), Greenwood (USA), Aurangabad (IN) and Suzhou (CN).

*John Davis*

John Davis  
Operator

01-15-2016

Date of calibration

Endress+Hauser Inc.  
2350 Endress Place  
Greenwood, IN 46143

**Endress+Hauser**   
People for Process Automation

## Flow Calibration without Adjustment

92004356-1275192

4017515743

Purchase order number

US-3601525789-100 / Endress+Hauser Inc.

Order N°/Manufacturer

23P50-AL1A1RA022AW

Order code

PROMAG 23 P 2"

Transmitter/Sensor

6A022116000

Serial N°

FIT-102

Tag N°

FCP-8.2 US

Calibration rig

156 us.gal/min ( $\pm 100\%$ )

Calibrated full scale

Current 4 - 20 mA

Calibrated output

0.9082

Calibration factor

0

Zero point

72.3 °F

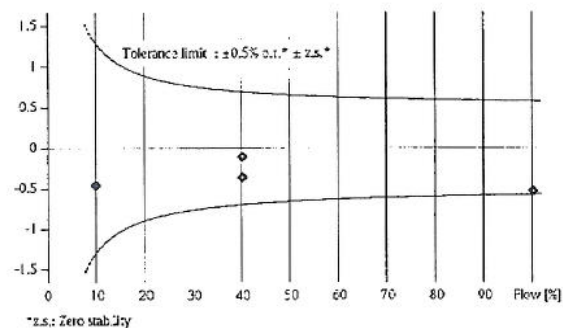
Water temperature

Flow [%]	Flow [us.gal/min]	Duration [sec]	V target [us.gal]	V meas. [us.gal]	$\Delta$ o.r.* [%]	Outp.** [mA]
10.0	15.643	60.0	15.654	15.582	-0.46	5.60
40.1	62.618	60.0	62.665	62.440	-0.36	10.40
40.2	62.628	60.0	62.673	62.607	-0.11	10.42
100.3	156.535	60.0	156.646	155.804	-0.54	19.97
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

\*o.r.: of race

\*\*Calculated value (4 - 20 mA)

Measured error % o.r.



For detailed data concerning output specifications of the unit under test, see Technical Information (TI), chapter: Performance characteristics.  
Traceability to the national standard for all test instruments used for the calibration is guaranteed.

Endress+Hauser Flowtec operates ISO/IEC 17025 accredited calibration facilities in Reinach (CH), Cernay (FR), Greenwood (USA), Aurangabad (IN) and Suzhou (CN).

09-20-2013

Date of calibration

Endress+Hauser Inc.  
10057 Porter Road  
La Porte, Texas 77571



W. Watkins

Operator

## Flow Calibration with Adjustment

92010358-1304709

WWRA-017895-F

Purchase order number

US-3601533868-200 / Endress+Hauser Inc.

Order N°/Manufacturer

23P50-AL1A1AA022AW

Order code

PROMAG 23 P 2"

Transmitter/Sensor

6C037316000

Serial N°

FIT-1205

Tag N°

FCP-7.1.6 US

Calibration rig

155.6102 us.gal/min ( $\pm 100\%$ )

Calibrated full scale

Current 4 - 20 mA

Calibrated output

0.9189

Calibration factor

0

Zero point

70.5 °F

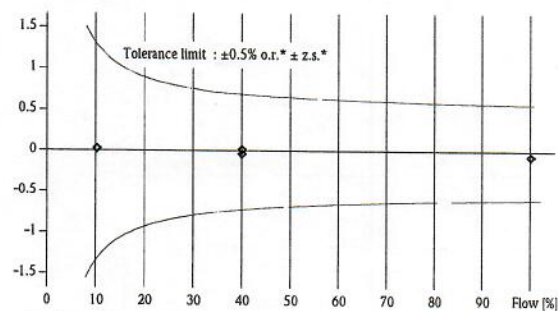
Water temperature

Flow [%]	Flow [us.gal/min]	Duration [sec]	V target [us.gal]	V meas. [us.gal]	$\Delta$ o.r.* [%]	Outp.** [mA]
10.1	15.712	60.2	15.764	15.770	0.04	5.62
39.9	62.125	60.2	62.338	62.323	-0.02	10.39
39.9	62.118	60.2	62.330	62.347	0.03	10.39
100.0	155.573	60.2	156.107	156.027	-0.05	19.99
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

\*o.r.: of rate

\*\*Calculated value (4 - 20 mA)

Measured error % o.r.



\*z.s.: Zero stability

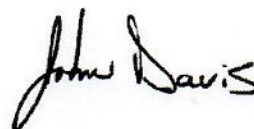
For detailed data concerning output specifications of the unit under test, see Technical Information (TI), chapter Performance characteristics. Traceability to the national standard for all test instruments used for the calibration is guaranteed.

Endress+Hauser Flowtec operates ISO/IEC 17025 accredited calibration facilities in Reinach (CH), Cernay (FR), Greenwood (USA), Aurangabad (IN) and Suzhou (CN).

01-15-2016

Date of calibration

Endress+Hauser Inc.  
2350 Endress Place  
Greenwood, IN 46143



John Davis  
Operator

## Flow Calibration without Adjustment

92013941-1385272

WWRA1095

Purchase order number

US-3601538697-100 / Endress+Hauser Inc.

Order N°/Manufacturer

23P50-AL1A1AA022AW

Order code

PROMAG 23 P 2"

Transmitter/Sensor

7700F216000

Serial N°

-

Tag N°

FCP-7.1.6 US

Calibration rig

156 us.gal/min (  $\triangleq$  100%)

Calibrated full scale

Current 4 - 20 mA

Calibrated output

0.9270

Calibration factor

0

Zero point

71.3 °F

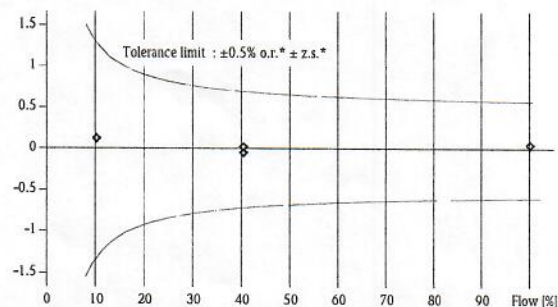
Water temperature

Flow [%]	Flow [us.gal/min]	Duration [sec]	V target [us.gal]	V meas. [us.gal]	$\Delta$ o.r.* [%]	Outp.** [mA]
10.1	15.725	60.2	15.778	15.800	0.14	5.62
40.3	62.822	60.2	63.033	63.055	0.04	10.45
40.3	62.848	60.2	63.063	63.041	-0.04	10.44
100.0	155.916	60.2	156.426	156.516	0.06	20.00
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

\*o.r.: of rate

\*\*Calculated value (4 - 20 mA)

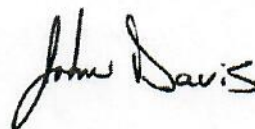
Measured error % o.r.



\*z.s.: Zero stability

For detailed data concerning output specifications of the unit under test, see Technical Information (TI), chapter Performance characteristics. Traceability to the national standard for all test instruments used for the calibration is guaranteed.

Endress+Hauser Flowtec operates ISO/IEC 17025 accredited calibration facilities in Reinach (CH), Cernay (FR), Greenwood (USA), Aurangabad (IN), Suzhou (CN) and Itatiba (BR).



John Davis  
Operator

05-04-2017

Date of calibration

Endress+Hauser Inc.  
2350 Endress Place  
Greenwood, IN 46143

## Flow Calibration with Adjustment

30361270-3757980

3800196517

Purchase order number

US-3005497039-10 / Endress+Hauser Flowtec

Order N°/Manufacturer

5P2B80-1CX9/0

Order code

Promag P 200 3"

Sensor/Transmitter

L200E016000

Serial N°

-

Tag N°

FCP-8.B

Calibration rig

398.3621 us.gal/min ( $\pm 100\%$ )

Calibrated full scale

Service interface

Calibrated output

1.1823

Calibration factor

-5

Zero point

80.3 °F

Water temperature

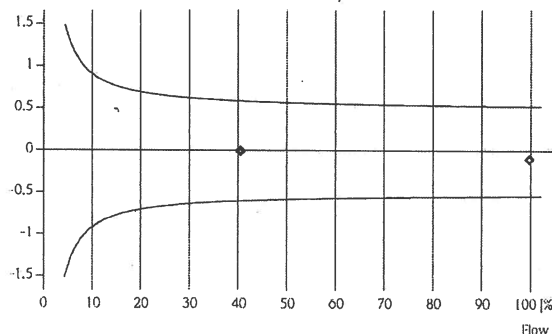
Flow [%]	Flow [us.gal/min]	Duration [s]	V target [us.gal]	V meas. [us.gal]	$\Delta$ o.r.* [%]	Outp.** [mA]
40.2	160.154	65.1	173.658	173.655	0.00	10.43
40.2	160.198	65.1	173.705	173.717	0.01	10.43
99.6	396.900	65.1	430.394	430.000	-0.09	19.93
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

\*o.r.: of reading

\*\*Calculated value (4 - 20 mA)

Measured error % o.r.

Tolerance limit:  $\pm 0.5\%$  o.r.\*  $\pm$  Zero stability



For detailed data concerning output specifications of the unit under test, see Technical Information (TI), chapter Performance characteristics.

The calibration is traceable to the N.I.S.T. through standards certified at preset intervals.

Endress+Hauser Flowtec operates ISO/IEC 17025 accredited calibration facilities in Reinach (CH), Cernay (FR), Greenwood (USA), Aurangabad (IN) and Suzhou (CN).

*Travis Burdette*

Travis Burdette

Operator

Certified acc. to

ISO 9001, Reg.-N° 030502.2

ISO 14001, Reg.-N° EMS561046

02-05-2016

Date of calibration

Endress+Hauser Flowtec, Division USA

2330 Endress Place

Greenwood, IN 46143



## Flow Calibration without Adjustment

92011344-1304708

WWRA-018498-F

Purchase order number

US-3601535048-200 / Endress+Hauser Inc.

Order N°/Manufacturer

23P50-AL1A1AA022AW

Order code

PROMAG 23 P 2"

Transmitter/Sensor

6C037216000

Serial N°

FIT-1204

Tag N°

FCP-7.1.6 US

Calibration rig

155.6102 us.gal/min (  $\pm 100\%$  )

Calibrated full scale

Current 4 - 20 mA

Calibrated output

0.9227

Calibration factor

20

Zero point

72.6 °F

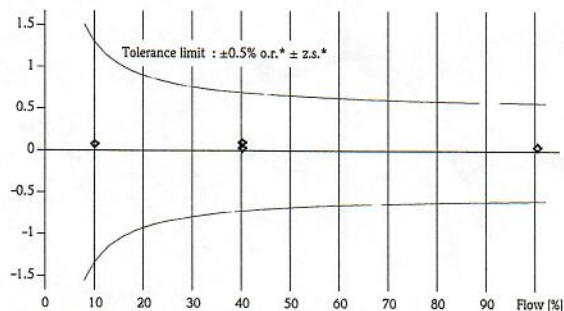
Water temperature

Flow [%]	Flow [us.gal/min]	Duration [sec]	V target [us.gal]	V meas. [us.gal]	$\Delta$ o.r.* [%]	Outp.** [mA]
9.9	15.455	60.2	15.507	15.520	0.09	5.59
40.0	62.288	60.2	62.491	62.557	0.11	10.41
40.1	62.343	60.2	62.550	62.578	0.04	10.41
100.3	156.108	60.2	156.637	156.728	0.06	20.06
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

\*o.r.: of rate

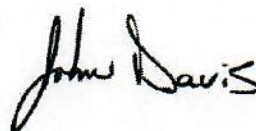
\*\*Calculated value [4 - 20 mA]

Measured error % o.r.



For detailed data concerning output specifications of the unit under test, see Technical Information (TI), chapter Performance characteristics.  
Traceability to the national standard for all test instruments used for the calibration is guaranteed.

Endress+Hauser Flowtec operates ISO/IEC 17025 accredited calibration facilities in Reinach (CH), Cernay (FR), Greenwood (USA), Aurangabad (IN) and Suzhou (CN).



John Davis  
Operator

05-06-2016

Date of calibration

Endress+Hauser Inc.  
2350 Endress Place  
Greenwood, IN 46143

Appendix D  
Second Quarter 2018  
Laboratory Analytical Reports



# Analytical Bench Log Book

## WDR pH Results

If the on site laboratory pH result for T-700 tank is less than pH 6.6 or greater than pH 8.3 the Injection well should be shut down until the problem is fixed.

Sample Name	Date of sampling	Time of sampling	Date of analysis	Time of analysis	pH Meter #1, #2, or #3 etc. See cover Sheet for Serial Number	Date pH meter Calibrated	Time pH meter Calibrated	Slope of the Curve	Analyst Name (for the pH result)	pH Result
1 SC-100B-WDR-569	02-06-18	15:20	02-06-18	15:23	HQ4400	02-06-18	00:30	-56.56	G. GLORIA	7.20

Notes:

2 SC-700B-WDR-569	02-06-18	15:20	02-06-18	15:24	HQ4400	02-06-18	00:30	-56.56	G. GLORIA	7.04
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Notes:

3 SC-100B-WDR-570	3-6-18	1300	3-6-18	1304	HQ4400	3-6-18	0030	-56.93		7.27
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Notes:

4 SC-700B-WDR-570	3-6-18	1300	3-6-18	1306	HQ4400	3-6-18	0030	-56.93		7.10
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Notes:

5 SC-100B-WDR-570	3-7-18	1335	3-7-18	1338	HQ4400	3-7-18	0030	-56.62		7.23
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Notes:

6 SC-700B-WDR-570	3-7-18	1325	3-7-18	1342	HQ4400	3-7-18	0030	-56.62		7.17
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Notes:

7 SC-100B-WDR-571	4-2-18	09:30	4-2-18	09:45	HQ4400	4-2-18	0430	-56.21	C. S. GONZ	7.17
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Notes:

Reminder: WDR Required pH Range for the Effluent (SC-700B) is: 6.5 - 8.4

# Analytical Bench Log Book

## WDR pH Results

If the on site laboratory pH result for T-700 tank is less than pH 6.6 or greater than pH 8.3 the Injection well should be shut down until the problem is fixed.

Sample Name	Date of sampling	Time of sampling	Date of analysis	Time of analysis	pH Meter #1, #2, or #3 etc. See cover Sheet for Serial Number	Date pH meter Calibrated	Time pH meter Calibrated	Slope of the Curve	Analyst Name (for the pH result)	pH Result
1 SC-700B-WDR-571	4-2-18	09:40	4-2-18	09:46	HR 440D	4-2-18	0430	-56.21	C. G. H. P.	7.16

Notes:

2 SC-701-WDR-571	4-2-18	09:40	4-2-18	09:47	HR 440D	4-2-18	0430	-56.21	C. G. H. P.	7.79
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Notes:

3 SC-700B-WDR-572	4-6-18	1820	4-6-18	1825	HR 440D	4-6-18	1808	-56.33	Ryan Phelps	7.3
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Notes:

4 SC-100B-WDR-573	5-1-18	1040	5-1-18	1045	HR 440D	5-1-18	0030	+54.18	Ron Phelps	7.2
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Notes: Samples NOT Picked up by courier rescheduled for 5-2-18 & resampled

Southwell

5 SC-700C-WDR-573	5-1-18	1042	5-1-18	1048	HR 440D	5-1-18	0030	+54.18	Ron Phelps	7.0
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Notes: Samples NOT Picked up by courier rescheduled for 5-2-18 & resampled

Southwell

6 SC-100B-WDR-573	5-2-18	1330	5-2-18	1335	HR 440D	5-2-18	0030	+54.02	Ron Phelps	7.2
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Notes:

7 SC-700B-WDR-573	5-2-18	1333	5-2-18	1337	HR 440D	5-2-18	0030	+54.02	Ron Phelps	7.0
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Notes:

Reminder: WDR Required pH Range for the Effluent (SC-700B) is: 6.5 - 8.4



# Analytical Bench Log Book

# WDR pH Results

If the on site laboratory pH result for T-700 tank is less than pH 6.6 or greater than pH 8.3 the Injection well should be shut down until the problem is fixed.

Sample Name	Date of sampling	Time of sampling	Date of analysis	Time of analysis	pH Meter #1, #2, or #3 etc. See cover Sheet for Serial Number	Date pH meter Calibrated	Time pH meter Calibrated	Slope of the Curve	Analyst Name (for the pH result)	pH Result
1 SC-100B WOR	06-05-18	1444	06-05-18	1450	HQ4400	06-05-18	11:30	56.37	G. GLORIA	7.36

Notes:

574

2 SC-700B-WOR-574	06-05-18	1500	06-05-18	1504	HQ4400	06-05-18	11:30	56.37	G. GLORIA	7.17
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Notes:

3										
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Notes:

4										
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Notes:

5										
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Notes:

6										
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Notes:

7										
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Notes:

Reminder: WDR Required pH Range for the Effluent (SC-700B) is: 6.5 - 8.4

# Analytical Bench Log Book

## WDR pH Results

If the on site laboratory pH result for T-700 tank is less than pH 6.6 or greater than pH 8.3 the Injection well should be shut down until the problem is fixed.

Sample Name	Date of sampling	Time of sampling	Date of analysis	Time of analysis	pH Meter #1, #2, or #3 etc. See cover Sheet for Serial Number	Date pH meter Calibrated	Time pH meter Calibrated	Slope of the Curve	Analyst Name (for the pH result)	pH Result
1 SC-700B-WDR-571	4-2-18	09:40	4-2-18	09:46	HQ440D	4-2-18	0430	-56.21	C Stamp	7.16

Notes:

2 SC-701-WDR-571	4-2-18	09:40	4-2-18	09:47	HQ440D	4-2-18	0430	-56.21	C Stamp	7.79
------------------	--------	-------	--------	-------	--------	--------	------	--------	---------	------

Notes:

3 SC-700B-WDR-572	4-6-18	1820	4-6-18	1825	HQ440D	4-6-18	1808	-56.33	Ryan Phelps	7.3
-------------------	--------	------	--------	------	--------	--------	------	--------	-------------	-----

Notes:

4 SC-100B-WDR-573	5-1-18	1040	5-1-18	1045	HQ440D	5-1-18	0030	-54.18	Ron Phelps	7.2
-------------------	--------	------	--------	------	--------	--------	------	--------	------------	-----

Notes: Samples NOT Picked up by courier rescheduled for 5-2-18 & resampled

Southwell

5 SC-700C-WDR-573	5-1-18	1042	5-1-18	1048	HQ440D	5-1-18	0030	-54.18	Ron Phelps	7.0
-------------------	--------	------	--------	------	--------	--------	------	--------	------------	-----

Notes: Samples NOT Pickup by courier rescheduled for 5-2-18 & resampled

Southwell

6 SC-100B-WDR-573	5-2-18	1330	5-2-18	1335	HQ440D	5-2-18	0030	-54.02	Ron Phelps	7.2
-------------------	--------	------	--------	------	--------	--------	------	--------	------------	-----

Notes:

7 SC-700B-WDR-573	5-2-18	1333	5-2-18	1337	HQ440D	5-2-18	0030	-54.02	Ron Phelps	7.0
-------------------	--------	------	--------	------	--------	--------	------	--------	------------	-----

Notes:

Reminder: WDR Required pH Range for the Effluent (SC-700B) is: 6.5 - 8.4



**Laboratories, Inc.**

Environmental Testing Laboratory Since 1949



Date of Report: 04/13/2018

Marlon Cartin

ASSET Laboratories

3151-3153 W. Post Rd  
Las Vegas, NV 89118

Client Project: N029488

BCL Project: Level IV

BCL Work Order: 1810533

Invoice ID: B300279

Enclosed are the results of analyses for samples received by the laboratory on 4/4/2018. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Contact Person: Vanessa Sandoval  
Client Service Rep

Stuart Buttram  
Technical Director

Certifications: CA ELAP #1186; NV #CA00014; OR ELAP #4032-001; AK UST101

*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.





**Laboratories, Inc.**

Environmental Testing Laboratory Since 1949

**Chain of Custody and Cooler Receipt Form for 1810533 Page 1 of 2**

Page 1 of 1

**CHAIN-OF-CUSTODY RECORD**

18-10533



TEL: 702.307.2699

Subcontractor:

BC Labs  
4100 Atlas Court  
Bakersfield, CA 93308

TEL: (661) 327-4911  
FAX: (661) 327-1918  
Acct #:

QC Level: Level IV

Field Sampler: SIGNED

03-Apr-18

Sample ID	Matrix	Date Collected	Bottle Type	Requested Tests
N029488-001A / SC-100B-WDR-571	Water	4/2/2018 9:30:00 AM	3202P	SM4500-NH3D 1
N029488-002A / SC-700B-WDR-571	Water	4/2/2018 9:40:00 AM	3202P	1



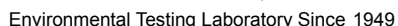
General Comments: Please email sample receipt acknowledgement to the PM.

Please use PO#N29488A. Please email Invoices and Account Receivable Statements to elvira@assetlaboratories.com. For questions, call Marion at (702)-307-2659. Please e-mail results to reports.lv@assetlaboratories.com by Normal TAT.

Please analyze for Ammonia by SM4500NH3D. EDD Requirement LabSpec7 edata.

GSO #: 540063040

Relinquished by:	Date/Time
4/3/2018 17:00	4418 09:20
Relinquished by:	



ASSET Laboratories  
3151-3153 W. Post Rd  
Las Vegas, NV 89118

**Reported:** 04/13/2018 11:56  
**Project:** Level IV  
**Project Number:** N029488  
**Project Manager:** Marlon Cartin

## Laboratory / Client Sample Cross Reference

Laboratory	Client Sample Information			
1810533-01	<b>COC Number:</b>	---	<b>Receive Date:</b>	04/04/2018 09:20
	<b>Project Number:</b>	---	<b>Sampling Date:</b>	04/02/2018 09:30
	<b>Sampling Location:</b>	---	<b>Sample Depth:</b>	---
	<b>Sampling Point:</b>	N029488-001A / SC-100B-WDR-571	<b>Lab Matrix:</b>	Water
	<b>Sampled By:</b>	---	<b>Sample Type:</b>	Water
1810533-02	<b>COC Number:</b>	---	<b>Receive Date:</b>	04/04/2018 09:20
	<b>Project Number:</b>	---	<b>Sampling Date:</b>	04/02/2018 09:40
	<b>Sampling Location:</b>	---	<b>Sample Depth:</b>	---
	<b>Sampling Point:</b>	N029488-002A / SC-700B-WDR-571	<b>Lab Matrix:</b>	Water
	<b>Sampled By:</b>	---	<b>Sample Type:</b>	Water

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ASSET Laboratories  
3151-3153 W. Post Rd  
Las Vegas, NV 89118

**Reported:** 04/13/2018 11:56  
**Project:** Level IV  
**Project Number:** N029488  
**Project Manager:** Marlon Cartin

## Water Analysis (General Chemistry)

<b>BCL Sample ID:</b>	1810533-01	<b>Client Sample Name:</b>	N029488-001A / SC-100B-WDR-571, 4/2/2018 9:30:00AM					
<b>Constituent</b>	<b>Result</b>	<b>Units</b>	<b>PQL</b>	<b>MDL</b>	<b>Method</b>	<b>MB Bias</b>	<b>Lab Quals</b>	<b>Run #</b>
Ammonia as N (Distilled)	ND	mg/L	0.20		SM-4500-NH3G	ND		1

<b>Run #</b>	<b>Method</b>	<b>Prep Date</b>	<b>Run Date/Time</b>	<b>Analyst</b>	<b>Instrument</b>	<b>Dilution</b>	<b>QC Batch ID</b>
1	SM-4500-NH3G	04/11/18 09:34	04/11/18 15:34	JMH	SC-1	1	B010428

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ASSET Laboratories  
3151-3153 W. Post Rd  
Las Vegas, NV 89118

**Reported:** 04/13/2018 11:56  
**Project:** Level IV  
**Project Number:** N029488  
**Project Manager:** Marlon Cartin

## Water Analysis (General Chemistry)

<b>BCL Sample ID:</b>	1810533-02	<b>Client Sample Name:</b>	N029488-002A / SC-700B-WDR-571, 4/2/2018 9:40:00AM					
<b>Constituent</b>	<b>Result</b>	<b>Units</b>	<b>PQL</b>	<b>MDL</b>	<b>Method</b>	<b>MB Bias</b>	<b>Lab Quals</b>	<b>Run #</b>
Ammonia as N (Distilled)	ND	mg/L	0.20		SM-4500-NH3G	ND		1

<b>Run #</b>	<b>Method</b>	<b>Prep Date</b>	<b>Run Date/Time</b>	<b>Analyst</b>	<b>Instrument</b>	<b>Dilution</b>	<b>QC Batch ID</b>
1	SM-4500-NH3G	04/11/18 09:34	04/11/18 15:36	JMH	SC-1	1	B010428

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ASSET Laboratories  
3151-3153 W. Post Rd  
Las Vegas, NV 89118

**Reported:** 04/13/2018 11:56  
**Project:** Level IV  
**Project Number:** N029488  
**Project Manager:** Marlon Cartin

## Water Analysis (General Chemistry)

### Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
<b>QC Batch ID: B010428</b>						
Ammonia as N (Distilled)	B010428-BLK1	ND	mg/L	0.20		



**Laboratories, Inc.**

Environmental Testing Laboratory Since 1949



ASSET Laboratories  
3151-3153 W. Post Rd  
Las Vegas, NV 89118

**Reported:** 04/13/2018 11:56  
**Project:** Level IV  
**Project Number:** N029488  
**Project Manager:** Marlon Cartin

## Water Analysis (General Chemistry)

### Quality Control Report - Laboratory Control Sample

								<u>Control Limits</u>		
Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Percent Recovery	RPD	Lab
Quals										
QC Batch ID: B010428										
	Ammonia as N (Distilled)	B010428-BS1	LCS	0.87300	1.0000	mg/L	87.3		85 - 115	

*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*

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ASSET Laboratories  
3151-3153 W. Post Rd  
Las Vegas, NV 89118

**Reported:** 04/13/2018 11:56  
**Project:** Level IV  
**Project Number:** N029488  
**Project Manager:** Marlon Cartin

## Water Analysis (General Chemistry)

### Quality Control Report - Precision & Accuracy

									Control Limits		
Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	RPD	Percent Recovery	Lab Quals
QC Batch ID: B010428		Used client sample: N									
Ammonia as N (Distilled)	DUP	1810497-03	0.18580	ND		mg/L			20		A02
	MS	1810497-03	0.18580	1.0049	1.0000	mg/L		81.9		80 - 120	
	MSD	1810497-03	0.18580	1.0488	1.0000	mg/L	4.3	86.3	20	80 - 120	

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All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.

April 16, 2018

Doug Scott  
CH2M HILL  
155 Grand Avenue, Suite 1000  
Oakland, CA 94612  
TEL: (970) 731-0636  
FAX: (510) 622-9129

Workorder No.: N029488

RE: PG&E Topock, 680375.03.IM.OP.00

Attention: Doug Scott

Enclosed are the results for sample(s) received on April 02, 2018 by ASSET Laboratories. The sample(s) are tested for the parameters as indicated in the enclosed chain of custody in accordance with the applicable laboratory certifications.

Thank you for the opportunity to service the needs of your company.

Please feel free to call me at (702) 307-2659 if I can be of further assistance to your company.

Sincerely,

Handwritten signature of Quennie Manimtim in black ink.

Quennie Manimtim  
Laboratory Director

The cover letter is an integral part of this analytical report. This Laboratory Report cannot be reproduced in part or in its entirety without written permission from the client and Advanced Technology Laboratories - Las Vegas.



**ASSET LABORATORIES**  
ANALYTICAL SUPPORT SERVICES FOR ENVIRONMENTAL TECHNOLOGIES

"Serving Clients with Passion and Professionalism"

CALIFORNIA | P: 562.219.7435 F: 562.219.7436  
11110 Artesia Blvd., Ste B, Cerritos, CA 90703  
ELAP Cert 2921  
EPA ID CA01638

NEVADA | P: 702.307.2659 F: 702.307.2691  
3151 W. Post Rd., Las Vegas, NV 89118  
ELAP Cert 2676 | NV Cert NV00922  
ORELAP/NELAP Cert 4046

**CLIENT:** CH2M HILL  
**Project:** PG&E Topock, 680375.03.IM.OP.00  
**Lab Order:** N029488

**CASE NARRATIVE****SAMPLE RECEIVING/GENERAL COMMENTS:**

All sample containers were received intact with proper chain of custody documentation.

Information on sample receipt conditions including discrepancies can be found in attached Sample Receipt Checklist Form.

Cooler temperature and sample preservation were verified upon receipt of samples if applicable.

Samples were analyzed within method holding time.

**Subcontracted Analyses:**

Ammonia was subcontracted to BC Labs- Bakersfield,CA.

**Analytical Comments for EPA 200.8:**

Dilution was necessary on some analytes for sample N029488-003 due to associated internal standard not meeting method criteria possibly due to matrix interference. Sample was analyzed with dilution and internal standard met method criteria. Affected analytes for this failed internal standard were reported at dilution that meet internal standard recovery limit.

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) are outside recovery criteria for Copper in QC samples N029640-001E-MS and N029640-001E-MSD possibly due to matrix interference. The associated Laboratory Control Sample (LCS) recovery was acceptable.

**Analytical Comments for EPA 218.6:**

Dilution was necessary for sample N029488-003 due to matrix interference. Sample was analyzed at lower dilution however matrix spike recovery and retention time criteria were not met indicating possible matrix interference. Sample was reported at dilution that meet matrix spike recovery limit and the detected peak within retention time window.



**ASSET Laboratories**

Date: 16-Apr-18

**CLIENT:** CH2M HILL  
**Project:** PG&E Topock, 680375.03.IM.OP.00  
**Lab Order:** N029488  
**Contract No:** IM3PLANT-AR

**Work Order Sample Summary**

Lab Sample ID	Client Sample ID	Matrix	Collection Date	Date Received	Date Reported
N029488-001A	SC-100B-WDR-571	Water	4/2/2018 9:30:00 AM	4/2/2018	4/16/2018
N029488-001B	SC-100B-WDR-571	Water	4/2/2018 9:30:00 AM	4/2/2018	4/16/2018
N029488-001C	SC-100B-WDR-571	Water	4/2/2018 9:30:00 AM	4/2/2018	4/16/2018
N029488-001D	SC-100B-WDR-571	Water	4/2/2018 9:30:00 AM	4/2/2018	4/16/2018
N029488-001E	SC-100B-WDR-571	Water	4/2/2018 9:30:00 AM	4/2/2018	4/16/2018
N029488-002A	SC-700B-WDR-571	Water	4/2/2018 9:40:00 AM	4/2/2018	4/16/2018
N029488-002B	SC-700B-WDR-571	Water	4/2/2018 9:40:00 AM	4/2/2018	4/16/2018
N029488-002C	SC-700B-WDR-571	Water	4/2/2018 9:40:00 AM	4/2/2018	4/16/2018
N029488-002D	SC-700B-WDR-571	Water	4/2/2018 9:40:00 AM	4/2/2018	4/16/2018
N029488-002E	SC-700B-WDR-571	Water	4/2/2018 9:40:00 AM	4/2/2018	4/16/2018
N029488-003A	SC-701-WDR-571	Water	4/2/2018 9:40:00 AM	4/2/2018	4/16/2018
N029488-003B	SC-701-WDR-571	Water	4/2/2018 9:40:00 AM	4/2/2018	4/16/2018
N029488-003C	SC-701-WDR-571	Water	4/2/2018 9:40:00 AM	4/2/2018	4/16/2018



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**ASSET Laboratories****ANALYTICAL RESULTS**

Print Date: 16-Apr-18

**CLIENT:** CH2M HILL  
**Lab Order:** N029488  
**Project:** PG&E Topock, 680375.03.IM.OP.00  
**Lab ID:** N029488-001

**Client Sample ID:** SC-100B-WDR-571  
**Collection Date:** 4/2/2018 9:30:00 AM  
**Matrix:** WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**SPECIFIC CONDUCTANCE****EPA 120.1**

RunID: <b>NV00922-WC_180403C</b>	QC Batch: <b>R123075</b>			PrepDate			Analyst: <b>LR</b>
Specific Conductance	7300	0.10	0.10	umhos/cm	1		4/3/2018 09:15 AM

<b>Qualifiers:</b>	B	Analyte detected in the associated Method Blank	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
	DO	Surrogate Diluted Out		



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**ASSET Laboratories****ANALYTICAL RESULTS**

Print Date: 16-Apr-18

**CLIENT:** CH2M HILL  
**Lab Order:** N029488  
**Project:** PG&E Topock, 680375.03.IM.OP.00  
**Lab ID:** N029488-002

**Client Sample ID:** SC-700B-WDR-571  
**Collection Date:** 4/2/2018 9:40:00 AM  
**Matrix:** WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**SPECIFIC CONDUCTANCE****EPA 120.1**

RunID: <b>NV00922-WC_180403C</b>	QC Batch: <b>R123075</b>			PrepDate			Analyst: <b>LR</b>
Specific Conductance	7200	0.10	0.10	umhos/cm	1		4/3/2018 09:15 AM

<b>Qualifiers:</b>	B	Analyte detected in the associated Method Blank	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
	DO	Surrogate Diluted Out		



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**ASSET Laboratories****ANALYTICAL RESULTS**

Print Date: 16-Apr-18

**CLIENT:** CH2M HILL  
**Lab Order:** N029488  
**Project:** PG&E Topock, 680375.03.IM.OP.00  
**Lab ID:** N029488-003

**Client Sample ID:** SC-701-WDR-571  
**Collection Date:** 4/2/2018 9:40:00 AM  
**Matrix:** WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**SPECIFIC CONDUCTANCE****EPA 120.1**

RunID: <b>NV00922-WC_180403C</b>	QC Batch: <b>R123075</b>			PrepDate		Analyst: <b>LR</b>
Specific Conductance	57000	0.10	0.10	umhos/cm	1	4/3/2018 09:15 AM

<b>Qualifiers:</b>	B	Analyte detected in the associated Method Blank	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
	DO	Surrogate Diluted Out		



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**CLIENT:** CH2M HILL  
**Work Order:** N029488  
**Project:** PG&E Topock, 680375.03.IM.OP.00

**ANALYTICAL QC SUMMARY REPORT****TestCode: 120.1\_WPGE**

Sample ID	N029488-003ADUP	SampType:	DUP	TestCode:	120.1_WPGE	Units:	umhos/cm	Prep Date:		RunNo:	123075		
Client ID:	ZZZZZZ	Batch ID:	R123075	TestNo:	EPA 120.1			Analysis Date:	4/3/2018	SeqNo:	2976445		
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Specific Conductance		57200.000		0.10						56900	0.526	2	

**Qualifiers:**

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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**ASSET Laboratories**
**ANALYTICAL RESULTS**
**Print Date:** 16-Apr-18

**CLIENT:** CH2M HILL  
**Lab Order:** N029488  
**Project:** PG&E Topock, 680375.03.IM.OP.00  
**Lab ID:** N029488-001

**Client Sample ID:** SC-100B-WDR-571  
**Collection Date:** 4/2/2018 9:30:00 AM  
**Matrix:** WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**TOTAL FILTERABLE RESIDUE**
**SM2540C**

RunID: <b>NV00922-WC_180403E</b>	QC Batch: <b>67448</b>			PrepDate	<b>4/3/2018</b>	Analyst: <b>LR</b>
Total Dissolved Solids (Residue, Filterable)	4500	50	50	mg/L	1	4/3/2018 01:11 PM

**Qualifiers:** B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 S Spike/Surrogate outside of limits due to matrix interference  
 DO Surrogate Diluted Out  
 E Value above quantitation range  
 ND Not Detected at the Reporting Limit  
 Results are wet unless otherwise specified



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**ASSET Laboratories**
**ANALYTICAL RESULTS**
**Print Date:** 16-Apr-18

**CLIENT:** CH2M HILL  
**Lab Order:** N029488  
**Project:** PG&E Topock, 680375.03.IM.OP.00  
**Lab ID:** N029488-002

**Client Sample ID:** SC-700B-WDR-571  
**Collection Date:** 4/2/2018 9:40:00 AM  
**Matrix:** WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**TOTAL FILTERABLE RESIDUE**
**SM2540C**

RunID: <b>NV00922-WC_180403E</b>	QC Batch: <b>67448</b>			PrepDate	<b>4/3/2018</b>	Analyst: <b>LR</b>
Total Dissolved Solids (Residue, Filterable)	4200	50	50	mg/L	1	4/3/2018 01:11 PM

**Qualifiers:** B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 S Spike/Surrogate outside of limits due to matrix interference  
 DO Surrogate Diluted Out  
 E Value above quantitation range  
 ND Not Detected at the Reporting Limit  
 Results are wet unless otherwise specified



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**ASSET Laboratories**
**ANALYTICAL RESULTS**
**Print Date:** 16-Apr-18

**CLIENT:** CH2M HILL  
**Lab Order:** N029488  
**Project:** PG&E Topock, 680375.03.IM.OP.00  
**Lab ID:** N029488-003

**Client Sample ID:** SC-701-WDR-571  
**Collection Date:** 4/2/2018 9:40:00 AM  
**Matrix:** WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**TOTAL FILTERABLE RESIDUE**
**SM2540C**

RunID: <b>NV00922-WC_180403E</b>	QC Batch: <b>67448</b>			PrepDate	<b>4/3/2018</b>	Analyst: <b>LR</b>
Total Dissolved Solids (Residue, Filterable)	46000	500	500	mg/L	1	4/3/2018 01:11 PM

**Qualifiers:** B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 S Spike/Surrogate outside of limits due to matrix interference  
 DO Surrogate Diluted Out  
 E Value above quantitation range  
 ND Not Detected at the Reporting Limit  
 Results are wet unless otherwise specified



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**CLIENT:** CH2M HILL  
**Work Order:** N029488  
**Project:** PG&E Topock, 680375.03.IM.OP.00

**ANALYTICAL QC SUMMARY REPORT****TestCode: 160.1\_2540C\_W**

Sample ID	LCS-67448	SampType:	LCS	TestCode:	160.1_2540C	Units:	mg/L	Prep Date:	4/3/2018	RunNo:	123115			
Client ID:	LCSW	Batch ID:	67448	TestNo:	SM2540C			Analysis Date:	4/3/2018	SeqNo:	2978271			
Analyte		Result		PQL	SPK value	SPK Ref Val		%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera		961.000		10	1000	0		96.1	80	120				

Sample ID	MB-674448	SampType:	MBLK	TestCode:	160.1_2540C	Units:	mg/L	Prep Date:	4/3/2018	RunNo:	123115			
Client ID:	PBW	Batch ID:	67448	TestNo:	SM2540C			Analysis Date:	4/3/2018	SeqNo:	2978272			
Analyte		Result		PQL	SPK value	SPK Ref Val		%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera		ND		10										

Sample ID	N029488-003ADUP	SampType:	DUP	TestCode:	160.1_2540C	Units:	mg/L	Prep Date:	4/3/2018	RunNo:	123115			
Client ID:	ZZZZZZ	Batch ID:	67448	TestNo:	SM2540C			Analysis Date:	4/3/2018	SeqNo:	2978276			
Analyte		Result		PQL	SPK value	SPK Ref Val		%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera		48550.000		500							46400	4.53	5	

**Qualifiers:**

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out	Calculations are based on raw values			



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# ASSET Laboratories

# ANALYTICAL RESULTS

Print Date: 16-Apr-18

CLIENT: CH2M HILL  
Lab Order: N029488  
Project: PG&E Topock, 680375.03.IM.OP.00  
Lab ID: N029488-001

Client Sample ID: SC-100B-WDR-571  
Collection Date: 4/2/2018 9:30:00 AM  
Matrix: WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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## TOTAL METALS BY ICP

## EPA 200.7

RunID: NV00922-ICP2_180412E	QC Batch: 67564	PrepDate	4/11/2018	Analyst: CEI
Aluminum	ND 40	50	µg/L	1 4/12/2018 10:58 PM
Boron	1100 74	100	µg/L	1 4/12/2018 10:58 PM
Iron	ND 18	20	µg/L	1 4/12/2018 10:58 PM

Qualifiers:	B	Analyte detected in the associated Method Blank	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
	DO	Surrogate Diluted Out		



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**ASSET Laboratories**
**ANALYTICAL RESULTS**
**Print Date:** 16-Apr-18

**CLIENT:** CH2M HILL  
**Lab Order:** N029488  
**Project:** PG&E Topock, 680375.03.IM.OP.00  
**Lab ID:** N029488-002

**Client Sample ID:** SC-700B-WDR-571  
**Collection Date:** 4/2/2018 9:40:00 AM  
**Matrix:** WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**TOTAL METALS BY ICP**
**EPA 200.7**

RunID: NV00922-ICP2_180412E	QC Batch: 67564	PrepDate	4/11/2018	Analyst: CEI
Aluminum	440 40	50	µg/L	1 4/12/2018 11:08 PM
Boron	1000 74	100	µg/L	1 4/12/2018 11:08 PM
Iron	ND 18	20	µg/L	1 4/12/2018 11:08 PM

**Qualifiers:** B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 S Spike/Surrogate outside of limits due to matrix interference  
 DO Surrogate Diluted Out  
 E Value above quantitation range  
 ND Not Detected at the Reporting Limit  
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**CLIENT:** CH2M HILL  
**Work Order:** N029488  
**Project:** PG&E Topock, 680375.03.IM.OP.00

**ANALYTICAL QC SUMMARY REPORT****TestCode: 200.7\_WPGEPB**

Sample ID <b>MB-67564</b>	SampType: <b>MBLK</b>	TestCode: <b>200.7_WPGE</b>	Units: <b>µg/L</b>	Prep Date: <b>4/11/2018</b>	RunNo: <b>123348</b>
Client ID: <b>PBW</b>	Batch ID: <b>67564</b>	TestNo: <b>EPA 200.7</b>		Analysis Date: <b>4/12/2018</b>	SeqNo: <b>2991695</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Aluminum	ND	50			
Boron	ND	100			
Iron	ND	20			

Sample ID <b>LCS1-67564</b>	SampType: <b>LCS</b>	TestCode: <b>200.7_WPGE</b>	Units: <b>µg/L</b>	Prep Date: <b>4/11/2018</b>	RunNo: <b>123348</b>
Client ID: <b>LCSW</b>	Batch ID: <b>67564</b>	TestNo: <b>EPA 200.7</b>		Analysis Date: <b>4/12/2018</b>	SeqNo: <b>2991696</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Aluminum	9719.789	50	10000	0	97.2 85 115
Boron	4733.065	100	5000	0	94.7 85 115
Iron	104.009	20	100.0	0	104 85 115

Sample ID <b>N029506-001D-MS1</b>	SampType: <b>MS</b>	TestCode: <b>200.7_WPGE</b>	Units: <b>µg/L</b>	Prep Date: <b>4/11/2018</b>	RunNo: <b>123348</b>
Client ID: <b>ZZZZZZ</b>	Batch ID: <b>67564</b>	TestNo: <b>EPA 200.7</b>		Analysis Date: <b>4/12/2018</b>	SeqNo: <b>2991702</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Aluminum	9994.355	50	10000	0	99.9 75 125
Boron	5265.943	100	5000	371.0	97.9 75 125
Iron	141.499	20	100.0	35.53	106 75 125

Sample ID <b>N029506-001D-MSD</b>	SampType: <b>MSD</b>	TestCode: <b>200.7_WPGE</b>	Units: <b>µg/L</b>	Prep Date: <b>4/11/2018</b>	RunNo: <b>123348</b>
Client ID: <b>ZZZZZZ</b>	Batch ID: <b>67564</b>	TestNo: <b>EPA 200.7</b>		Analysis Date: <b>4/12/2018</b>	SeqNo: <b>2991703</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Aluminum	10047.303	50	10000	0	100 75 125 9994 0.528 20
Boron	5268.033	100	5000	371.0	97.9 75 125 5266 0.0397 20
Iron	142.886	20	100.0	35.53	107 75 125 141.5 0.975 20

**Qualifiers:**

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		



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**ASSET Laboratories**
**ANALYTICAL RESULTS**
**Print Date:** 16-Apr-18

**CLIENT:** CH2M HILL  
**Lab Order:** N029488  
**Project:** PG&E Topock, 680375.03.IM.OP.00  
**Lab ID:** N029488-001

**Client Sample ID:** SC-100B-WDR-571  
**Collection Date:** 4/2/2018 9:30:00 AM  
**Matrix:** WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**TOTAL METALS BY ICPMS**
**EPA 200.8**

RunID: NV00922-ICP7_180413B	QC Batch: 67642	PrepDate	4/13/2018	Analyst: CEI		
Antimony	ND	0.16	0.50	µg/L	1	4/13/2018 01:05 PM
Arsenic	2.9	0.081	0.10	µg/L	1	4/13/2018 01:05 PM
Barium	29	0.15	1.0	µg/L	1	4/13/2018 01:05 PM
Copper	ND	0.55	1.0	µg/L	1	4/13/2018 01:05 PM
Lead	ND	0.13	1.0	µg/L	1	4/13/2018 01:05 PM
Manganese	7.0	0.26	0.50	µg/L	1	4/13/2018 01:05 PM
Molybdenum	21	0.21	0.50	µg/L	1	4/13/2018 01:05 PM
Nickel	ND	0.26	1.0	µg/L	1	4/15/2018 06:36 PM
Zinc	ND	2.3	10	µg/L	1	4/13/2018 01:05 PM

**Qualifiers:** B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 S Spike/Surrogate outside of limits due to matrix interference  
 DO Surrogate Diluted Out  
 E Value above quantitation range  
 ND Not Detected at the Reporting Limit  
 Results are wet unless otherwise specified



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**ASSET Laboratories**
**ANALYTICAL RESULTS**
**Print Date:** 16-Apr-18

**CLIENT:** CH2M HILL  
**Lab Order:** N029488  
**Project:** PG&E Topock, 680375.03.IM.OP.00  
**Lab ID:** N029488-002

**Client Sample ID:** SC-700B-WDR-571  
**Collection Date:** 4/2/2018 9:40:00 AM  
**Matrix:** WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**TOTAL METALS BY ICPMS**
**EPA 200.8**

RunID: NV00922-ICP7_180413B	QC Batch: 67642	PrepDate	4/13/2018	Analyst: CEI		
Antimony	ND	0.16	0.50	µg/L	1	4/13/2018 01:16 PM
Arsenic	0.10	0.081	0.10	µg/L	1	4/13/2018 01:16 PM
Barium	16	0.15	1.0	µg/L	1	4/13/2018 01:16 PM
Copper	ND	0.55	1.0	µg/L	1	4/13/2018 01:16 PM
Lead	ND	0.13	1.0	µg/L	1	4/13/2018 01:16 PM
Manganese	24	0.26	0.50	µg/L	1	4/13/2018 01:16 PM
Molybdenum	20	0.21	0.50	µg/L	1	4/13/2018 01:16 PM
Nickel	2.4	0.26	1.0	µg/L	1	4/15/2018 06:41 PM
Zinc	ND	2.3	10	µg/L	1	4/13/2018 01:16 PM

**Qualifiers:** B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 S Spike/Surrogate outside of limits due to matrix interference  
 DO Surrogate Diluted Out  
 E Value above quantitation range  
 ND Not Detected at the Reporting Limit  
 Results are wet unless otherwise specified



**ASSET LABORATORIES**  
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**ASSET Laboratories**
**ANALYTICAL RESULTS**
**Print Date:** 16-Apr-18

**CLIENT:** CH2M HILL  
**Lab Order:** N029488  
**Project:** PG&E Topock, 680375.03.IM.OP.00  
**Lab ID:** N029488-003

**Client Sample ID:** SC-701-WDR-571  
**Collection Date:** 4/2/2018 9:40:00 AM  
**Matrix:** WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**TOTAL METALS BY ICPMS**
**EPA 200.8**

RunID: NV00922-ICP7_180413B	QC Batch: 67642	PrepDate	4/13/2018	Analyst: CEI		
Antimony	ND	0.78	2.5	µg/L	5	4/13/2018 01:32 PM
Arsenic	1.2	0.41	0.50	µg/L	5	4/13/2018 01:32 PM
Barium	140	0.75	5.0	µg/L	5	4/13/2018 01:32 PM
Beryllium	ND	1.1	12	µg/L	25	4/13/2018 03:25 PM
Cadmium	ND	0.26	2.5	µg/L	5	4/13/2018 01:32 PM
Cobalt	ND	0.042	0.50	µg/L	1	4/13/2018 01:26 PM
Copper	ND	2.7	5.0	µg/L	5	4/13/2018 01:32 PM
Lead	ND	0.64	5.0	µg/L	5	4/13/2018 01:32 PM
Manganese	69	0.26	0.50	µg/L	1	4/13/2018 01:26 PM
Molybdenum	230	1.1	2.5	µg/L	5	4/13/2018 01:32 PM
Nickel	6.6	1.3	5.0	µg/L	5	4/15/2018 06:58 PM
Selenium	50	1.8	2.5	µg/L	5	4/13/2018 01:32 PM
Silver	ND	1.2	2.5	µg/L	5	4/13/2018 01:32 PM
Thallium	ND	0.96	2.5	µg/L	5	4/13/2018 01:32 PM
Vanadium	2.5	0.28	1.0	µg/L	1	4/13/2018 01:26 PM
Zinc	ND	11	50	µg/L	5	4/13/2018 01:32 PM

**Qualifiers:** B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 S Spike/Surrogate outside of limits due to matrix interference  
 DO Surrogate Diluted Out  
 E Value above quantitation range  
 ND Not Detected at the Reporting Limit  
 Results are wet unless otherwise specified



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 3151 W. Post Rd., Las Vegas, NV 89118  
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"Serving Clients with Passion and Professionalism"

**CLIENT:** CH2M HILL  
**Work Order:** N029488  
**Project:** PG&E Topock, 680375.03.IM.OP.00

**ANALYTICAL QC SUMMARY REPORT****TestCode: 200.8\_W**

Sample ID	MB-67642	SampType:	MBLK	TestCode:	200.8_W	Units:	µg/L	Prep Date:	4/13/2018	RunNo:	123377	
Client ID:	PBW	Batch ID:	67642	TestNo:	EPA 200.8			Analysis Date:	4/13/2018	SeqNo:	2993815	
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony		ND	0.50									
Arsenic		ND	0.10									
Barium		ND	1.0									
Beryllium		ND	0.50									
Cadmium		ND	0.50									
Cobalt		ND	0.50									
Copper		ND	1.0									
Lead		ND	1.0									
Manganese		ND	0.50									
Molybdenum		ND	0.50									
Selenium		ND	0.50									
Silver		ND	0.50									
Thallium		ND	0.50									
Vanadium		ND	1.0									
Zinc		ND	10									

Sample ID	LCS-67642	SampType: LCS	TestCode: 200.8_W	Units: µg/L	Prep Date: 4/13/2018	RunNo: 123377					
Client ID:	LCSW	Batch ID: 67642	TestNo: EPA 200.8		Analysis Date: 4/13/2018	SeqNo: 2993816					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	10.423	0.50	10.00	0	104	85	115				
Arsenic	10.166	0.10	10.00	0	102	85	115				
Barium	10.381	1.0	10.00	0	104	85	115				
Beryllium	10.033	0.50	10.00	0	100	85	115				
Cadmium	10.544	0.50	10.00	0	105	85	115				
Cobalt	9.947	0.50	10.00	0	99.5	85	115				
Copper	10.364	1.0	10.00	0	104	85	115				
Lead	10.675	1.0	10.00	0	107	85	115				

**Qualifiers:**

B Analyte detected in the associated Method Blank  
 ND Not Detected at the Reporting Limit  
 DO Surrogate Diluted Out  
 E Value above quantitation range  
 R RPD outside accepted recovery limits  
 H Holding times for preparation or analysis exceeded  
 S Spike/Surrogate outside of limits due to matrix interference

Calculations are based on raw values



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**CLIENT:** CH2M HILL  
**Work Order:** N029488  
**Project:** PG&E Topock, 680375.03.IM.OP.00

## ANALYTICAL QC SUMMARY REPORT

**TestCode:** 200.8\_W

Sample ID	<b>LCS-67642</b>	SampType:	<b>LCS</b>	TestCode:	<b>200.8_W</b>	Units:	<b>µg/L</b>	Prep Date:	<b>4/13/2018</b>	RunNo:	<b>123377</b>
Client ID:	<b>LCSW</b>	Batch ID:	<b>67642</b>	TestNo:	<b>EPA 200.8</b>			Analysis Date:	<b>4/13/2018</b>	SeqNo:	<b>2993816</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	102.656	0.50	100.0	0	103	85	115				
Molybdenum	10.001	0.50	10.00	0	100	85	115				
Selenium	9.742	0.50	10.00	0	97.4	85	115				
Silver	10.440	0.50	10.00	0	104	85	115				
Thallium	10.465	0.50	10.00	0	105	85	115				
Vanadium	10.515	1.0	10.00	0	105	85	115				
Zinc	102.624	10	100.0	0	103	85	115				

Sample ID	<b>N029640-001E-MS</b>	SampType:	<b>MS</b>	TestCode:	<b>200.8_W</b>	Units:	<b>µg/L</b>	Prep Date:	<b>4/13/2018</b>	RunNo:	<b>123377</b>
Client ID:	<b>ZZZZZZ</b>	Batch ID:	<b>67642</b>	TestNo:	<b>EPA 200.8</b>			Analysis Date:	<b>4/13/2018</b>	SeqNo:	<b>2993834</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	10.829	0.50	10.00	0	108	75	125				
Arsenic	10.572	0.10	10.00	0.1346	104	75	125				
Barium	28.536	1.0	10.00	19.47	90.7	75	125				
Beryllium	11.169	0.50	10.00	0	112	75	125				
Cadmium	9.814	0.50	10.00	0	98.1	75	125				
Cobalt	9.215	0.50	10.00	0.3676	88.5	75	125				
Copper	7.057	1.0	10.00	0	70.6	75	125				S
Lead	10.469	1.0	10.00	0	105	75	125				
Molybdenum	36.676	0.50	10.00	26.69	99.9	75	125				
Selenium	13.472	0.50	10.00	4.128	93.4	75	125				
Silver	9.677	0.50	10.00	0	96.8	75	125				
Thallium	9.371	0.50	10.00	0	93.7	75	125				
Vanadium	10.386	1.0	10.00	0.2939	101	75	125				
Zinc	105.456	10	100.0	0	105	75	125				

### Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out	Calculations are based on raw values			



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"Serving Clients with Passion and Professionalism"



**CLIENT:** CH2M HILL  
**Work Order:** N029488  
**Project:** PG&E Topock, 680375.03.IM.OP.00

## ANALYTICAL QC SUMMARY REPORT

**TestCode:** 200.8\_W

Sample ID	<b>N029640-001E-MS</b>	SampType:	<b>MS</b>	TestCode:	<b>200.8_W</b>	Units:	<b>µg/L</b>	Prep Date:	<b>4/13/2018</b>	RunNo:	<b>123377</b>
Client ID:	<b>ZZZZZZ</b>	Batch ID:	<b>67642</b>	TestNo:	<b>EPA 200.8</b>			Analysis Date:	<b>4/13/2018</b>	SeqNo:	<b>2993835</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Manganese	212.682	2.5	100.0	129.2	83.5	75	125				
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Sample ID	<b>N029640-001E-MSD</b>	SampType:	<b>MSD</b>	TestCode:	<b>200.8_W</b>	Units:	<b>µg/L</b>	Prep Date:	<b>4/13/2018</b>	RunNo:	<b>123377</b>
Client ID:	<b>ZZZZZZ</b>	Batch ID:	<b>67642</b>	TestNo:	<b>EPA 200.8</b>			Analysis Date:	<b>4/13/2018</b>	SeqNo:	<b>2993836</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Antimony	10.757	0.50	10.00	0	108	75	125	10.83	0.670	20	
Arsenic	10.659	0.10	10.00	0.1346	105	75	125	10.57	0.813	20	
Barium	28.722	1.0	10.00	19.47	92.5	75	125	28.54	0.647	20	
Beryllium	11.331	0.50	10.00	0	113	75	125	11.17	1.44	20	
Cadmium	9.824	0.50	10.00	0	98.2	75	125	9.814	0.106	20	
Cobalt	9.201	0.50	10.00	0.3676	88.3	75	125	9.215	0.148	20	
Copper	7.133	1.0	10.00	0	71.3	75	125	7.057	1.06	20	S
Lead	10.440	1.0	10.00	0	104	75	125	10.47	0.269	20	
Molybdenum	37.053	0.50	10.00	26.69	104	75	125	36.68	1.02	20	
Selenium	14.571	0.50	10.00	4.128	104	75	125	13.47	7.84	20	
Silver	9.786	0.50	10.00	0	97.9	75	125	9.677	1.12	20	
Thallium	9.488	0.50	10.00	0	94.9	75	125	9.371	1.24	20	
Vanadium	10.353	1.0	10.00	0.2939	101	75	125	10.39	0.323	20	
Zinc	106.052	10	100.0	0	106	75	125	105.5	0.564	20	

Sample ID	<b>N029640-001E-MSD</b>	SampType:	<b>MSD</b>	TestCode:	<b>200.8_W</b>	Units:	<b>µg/L</b>	Prep Date:	<b>4/13/2018</b>	RunNo:	<b>123377</b>
Client ID:	<b>ZZZZZZ</b>	Batch ID:	<b>67642</b>	TestNo:	<b>EPA 200.8</b>			Analysis Date:	<b>4/13/2018</b>	SeqNo:	<b>2993839</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Manganese	218.144	2.5	100.0	129.2	89.0	75	125	212.7	2.54	20	
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### Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out	Calculations are based on raw values			



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"Serving Clients with Passion and Professionalism"

**CLIENT:** CH2M HILL  
**Work Order:** N029488  
**Project:** PG&E Topock, 680375.03.IM.OP.00

## ANALYTICAL QC SUMMARY REPORT

**TestCode:** 200.8\_W

Sample ID	MB-67642	SampType:	MBLK	TestCode:	200.8_W	Units:	µg/L	Prep Date:	4/13/2018	RunNo:	123379			
Client ID:	PBW	Batch ID:	67642	TestNo:	EPA 200.8			Analysis Date:	4/15/2018	SeqNo:	2994231			
Analyte		Result		PQL	SPK value	SPK Ref Val		%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Nickel ND 1.0

Sample ID	LCS-67642	SampType:	LCS	TestCode:	200.8_W	Units:	µg/L	Prep Date:	4/13/2018	RunNo:	123379			
Client ID:	LCSW	Batch ID:	67642	TestNo:	EPA 200.8			Analysis Date:	4/15/2018	SeqNo:	2994232			
Analyte		Result		PQL	SPK value	SPK Ref Val		%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Nickel 9.983 1.0 10.00 0 99.8 85 115

Sample ID	N029640-001E-MS	SampType:	MS	TestCode:	200.8_W	Units:	µg/L	Prep Date:	4/13/2018	RunNo:	123379			
Client ID:	ZZZZZZ	Batch ID:	67642	TestNo:	EPA 200.8			Analysis Date:	4/15/2018	SeqNo:	2994237			
Analyte		Result		PQL	SPK value	SPK Ref Val		%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Nickel 16.225 1.0 10.00 6.364 98.6 75 125

Sample ID	N029640-001E-MSD	SampType:	MSD	TestCode:	200.8_W	Units:	µg/L	Prep Date:	4/13/2018	RunNo:	123379			
Client ID:	ZZZZZZ	Batch ID:	67642	TestNo:	EPA 200.8			Analysis Date:	4/15/2018	SeqNo:	2994238			
Analyte		Result		PQL	SPK value	SPK Ref Val		%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Nickel 15.865 1.0 10.00 6.364 95.0 75 125 16.22 2.24 20

### Qualifiers:

- |    |   |                                      |                                      |   |  |
|----|---|--------------------------------------|--------------------------------------|---|--|
| B  | Analyte detected in the associated Method Blank | E                                    | Value above quantitation range       | H | Holding times for preparation or analysis exceeded           |
| ND | Not Detected at the Reporting Limit             | R                                    | RPD outside accepted recovery limits | S | Spike/Surrogate outside of limits due to matrix interference |
| DO | Surrogate Diluted Out                           | Calculations are based on raw values |                                      |   |  |



**ASSET LABORATORIES**  
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**ASSET Laboratories**
**ANALYTICAL RESULTS**
**Print Date:** 16-Apr-18

**CLIENT:** CH2M HILL  
**Lab Order:** N029488  
**Project:** PG&E Topock, 680375.03.IM.OP.00  
**Lab ID:** N029488-001

**Client Sample ID:** SC-100B-WDR-571  
**Collection Date:** 4/2/2018 9:30:00 AM  
**Matrix:** WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**HEXAVALENT CHROMIUM BY IC**
**EPA 218.6**

RunID: <b>NV00922-IC7_180403B</b>	QC Batch: <b>R123089</b>				PrepDate		Analyst: <b>RAB</b>
Hexavalent Chromium	510	3.3	20		µg/L	100	4/3/2018 03:56 PM

**TOTAL METALS BY ICPMS**
**EPA 200.8**

RunID: <b>NV00922-ICP7_180413A</b>	QC Batch: <b>67642</b>				PrepDate	<b>4/13/2018</b>	Analyst: <b>CEI</b>
Chromium	510	0.65	5.0		µg/L	5	4/13/2018 01:10 PM

<b>Qualifiers:</b>	B	Analyte detected in the associated Method Blank	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
	DO	Surrogate Diluted Out		



**ASSET LABORATORIES**  
ANALYTICAL SUPPORT SERVICES FOR ENVIRONMENTAL TECHNOLOGIES

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**ASSET Laboratories**
**ANALYTICAL RESULTS**
**Print Date:** 16-Apr-18

**CLIENT:** CH2M HILL  
**Lab Order:** N029488  
**Project:** PG&E Topock, 680375.03.IM.OP.00  
**Lab ID:** N029488-002

**Client Sample ID:** SC-700B-WDR-571  
**Collection Date:** 4/2/2018 9:40:00 AM  
**Matrix:** WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**HEXAVALENT CHROMIUM BY IC**
**EPA 218.6**

RunID: <b>NV00922-IC7_180403B</b>	QC Batch: <b>R123089</b>				PrepDate		Analyst: <b>RAB</b>
Hexavalent Chromium	ND	0.033	0.20		µg/L	1	4/3/2018 04:24 PM

**TOTAL METALS BY ICPMS**
**EPA 200.8**

RunID: <b>NV00922-ICP7_180413A</b>	QC Batch: <b>67642</b>				PrepDate	<b>4/13/2018</b>	Analyst: <b>CEI</b>
Chromium	1.3	0.13	1.0		µg/L	1	4/13/2018 01:16 PM

<b>Qualifiers:</b>	B	Analyte detected in the associated Method Blank	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
	DO	Surrogate Diluted Out		



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**ASSET Laboratories**
**ANALYTICAL RESULTS**
**Print Date:** 16-Apr-18

**CLIENT:** CH2M HILL  
**Lab Order:** N029488  
**Project:** PG&E Topock, 680375.03.IM.OP.00  
**Lab ID:** N029488-003

**Client Sample ID:** SC-701-WDR-571  
**Collection Date:** 4/2/2018 9:40:00 AM  
**Matrix:** WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**HEXAVALENT CHROMIUM BY IC**
**EPA 218.6**

RunID: <b>NV00922-IC7_180403B</b>	QC Batch: <b>R123089</b>				PrepDate		Analyst: <b>RAB</b>
Hexavalent Chromium	ND	0.83	5.0		µg/L	25	4/3/2018 03:37 PM

**TOTAL METALS BY ICPMS**
**EPA 200.8**

RunID: <b>NV00922-ICP7_180413A</b>	QC Batch: <b>67642</b>				PrepDate	<b>4/13/2018</b>	Analyst: <b>CEI</b>
Chromium	1.7	0.13	1.0		µg/L	1	4/13/2018 01:26 PM

**Qualifiers:** B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 S Spike/Surrogate outside of limits due to matrix interference  
 DO Surrogate Diluted Out  
 E Value above quantitation range  
 ND Not Detected at the Reporting Limit  
 Results are wet unless otherwise specified



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**CLIENT:** CH2M HILL  
**Work Order:** N029488  
**Project:** PG&E Topock, 680375.03.IM.OP.00

**ANALYTICAL QC SUMMARY REPORT****TestCode: 200.8\_W\_CRPGE**

Sample ID <b>MB-67642</b>	SampType: <b>MBLK</b>	TestCode: <b>200.8_W_CR</b>	Units: <b>µg/L</b>	Prep Date: <b>4/13/2018</b>	RunNo: <b>123376</b>
Client ID: <b>PBW</b>	Batch ID: <b>67642</b>	TestNo: <b>EPA 200.8</b>		Analysis Date: <b>4/13/2018</b>	SeqNo: <b>2993644</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual
Chromium	ND	1.0			

Sample ID <b>LCS-67642</b>	SampType: <b>LCS</b>	TestCode: <b>200.8_W_CR</b>	Units: <b>µg/L</b>	Prep Date: <b>4/13/2018</b>	RunNo: <b>123376</b>
Client ID: <b>LCSW</b>	Batch ID: <b>67642</b>	TestNo: <b>EPA 200.8</b>		Analysis Date: <b>4/13/2018</b>	SeqNo: <b>2993645</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual
Chromium	10.364	1.0	10.00	0	104 85 115

Sample ID <b>N029640-001E-MS</b>	SampType: <b>MS</b>	TestCode: <b>200.8_W_CR</b>	Units: <b>µg/L</b>	Prep Date: <b>4/13/2018</b>	RunNo: <b>123376</b>
Client ID: <b>ZZZZZZ</b>	Batch ID: <b>67642</b>	TestNo: <b>EPA 200.8</b>		Analysis Date: <b>4/13/2018</b>	SeqNo: <b>2993663</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual
Chromium	24.701	1.0	10.00	16.35	83.5 75 125

Sample ID <b>N029640-001E-MSD</b>	SampType: <b>MSD</b>	TestCode: <b>200.8_W_CR</b>	Units: <b>µg/L</b>	Prep Date: <b>4/13/2018</b>	RunNo: <b>123376</b>
Client ID: <b>ZZZZZZ</b>	Batch ID: <b>67642</b>	TestNo: <b>EPA 200.8</b>		Analysis Date: <b>4/13/2018</b>	SeqNo: <b>2993665</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual
Chromium	25.004	1.0	10.00	16.35	86.5 75 125 24.70 1.22 20

**Qualifiers:**

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out	Calculations are based on raw values			



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**CLIENT:** CH2M HILL  
**Work Order:** N029488  
**Project:** PG&E Topock, 680375.03.IM.OP.00

## ANALYTICAL QC SUMMARY REPORT

**TestCode:** 218.6\_WU\_PGE

Sample ID	LCS-R123089	SampType:	LCS	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	123089			
Client ID:	LCSW	Batch ID:	R123089	TestNo:	EPA 218.6			Analysis Date:	4/3/2018	SeqNo:	2977179			
Analyte		Result		PQL	SPK value	SPK Ref Val		%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Hexavalent Chromium	5.085	0.20	5.000	0	102	90	110							
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Sample ID	MB-R123089	SampType:	MBLK	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	123089			
Client ID:	PBW	Batch ID:	R123089	TestNo:	EPA 218.6			Analysis Date:	4/3/2018	SeqNo:	2977180			
Analyte		Result		PQL	SPK value	SPK Ref Val		%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Hexavalent Chromium	ND	0.20												
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Sample ID	N029488-003BMS	SampType:	MS	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	123089			
Client ID:	ZZZZZZ	Batch ID:	R123089	TestNo:	EPA 218.6			Analysis Date:	4/3/2018	SeqNo:	2977182			
Analyte		Result		PQL	SPK value	SPK Ref Val		%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Hexavalent Chromium	25.848	5.0	25.00	0	103	90	110							
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Sample ID	N029488-001CMS	SampType:	MS	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	123089			
Client ID:	ZZZZZZ	Batch ID:	R123089	TestNo:	EPA 218.6			Analysis Date:	4/3/2018	SeqNo:	2977184			
Analyte		Result		PQL	SPK value	SPK Ref Val		%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Hexavalent Chromium	1014.210	20	500.0	509.4	101	90	110							
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Sample ID	N029488-001CMSD	SampType:	MSD	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	123089			
Client ID:	ZZZZZZ	Batch ID:	R123089	TestNo:	EPA 218.6			Analysis Date:	4/3/2018	SeqNo:	2977185			
Analyte		Result		PQL	SPK value	SPK Ref Val		%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Hexavalent Chromium	1013.270	20	500.0	509.4	101	90	110	1014	0.0927	20				
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### Qualifiers:

- |    |   |                                      |                                      |   |  |
|----|---|--------------------------------------|--------------------------------------|---|--|
| B  | Analyte detected in the associated Method Blank | E                                    | Value above quantitation range       | H | Holding times for preparation or analysis exceeded           |
| ND | Not Detected at the Reporting Limit             | R                                    | RPD outside accepted recovery limits | S | Spike/Surrogate outside of limits due to matrix interference |
| DO | Surrogate Diluted Out                           | Calculations are based on raw values |                                      |   |  |



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ORELAP/NELAP Cert 4046

"Serving Clients with Passion and Professionalism"

**CLIENT:** CH2M HILL  
**Work Order:** N029488  
**Project:** PG&E Topock, 680375.03.IM.OP.00

## ANALYTICAL QC SUMMARY REPORT

**TestCode:** 218.6\_WU\_PGE

Sample ID	N029488-002CMS	SampType:	MS	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	123089			
Client ID:	ZZZZZZ	Batch ID:	R123089	TestNo:	EPA 218.6			Analysis Date:	4/3/2018	SeqNo:	2977187			
Analyte		Result		PQL	SPK value	SPK Ref Val		%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Hexavalent Chromium	1.063	0.20	1.000	0	106	90	110							
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Sample ID	N029488-001CDUP	SampType:	DUP	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	123089			
Client ID:	ZZZZZZ	Batch ID:	R123089	TestNo:	EPA 218.6			Analysis Date:	4/3/2018	SeqNo:	2977188			
Analyte		Result		PQL	SPK value	SPK Ref Val		%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Hexavalent Chromium	504.890	20									509.4	0.895	20	
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### Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out	Calculations are based on raw values			



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**ASSET Laboratories**
**ANALYTICAL RESULTS**
**Print Date:** 16-Apr-18

**CLIENT:** CH2M HILL  
**Lab Order:** N029488  
**Project:** PG&E Topock, 680375.03.IM.OP.00  
**Lab ID:** N029488-001

**Client Sample ID:** SC-100B-WDR-571  
**Collection Date:** 4/2/2018 9:30:00 AM  
**Matrix:** WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**TURBIDITY**
**SM 2130B**

RunID: <b>NV00922-WC_180403D</b>	QC Batch: <b>R123076</b>	PrepDate		Analyst: <b>LR</b>			
Turbidity	0.19	0.10	0.10		NTU	1	4/3/2018 03:30 PM

**Qualifiers:** B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 S Spike/Surrogate outside of limits due to matrix interference  
 DO Surrogate Diluted Out  
 E Value above quantitation range  
 ND Not Detected at the Reporting Limit  
 Results are wet unless otherwise specified



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**ASSET Laboratories**
**ANALYTICAL RESULTS**
**Print Date:** 16-Apr-18

**CLIENT:** CH2M HILL  
**Lab Order:** N029488  
**Project:** PG&E Topock, 680375.03.IM.OP.00  
**Lab ID:** N029488-002

**Client Sample ID:** SC-700B-WDR-571  
**Collection Date:** 4/2/2018 9:40:00 AM  
**Matrix:** WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**TURBIDITY**
**SM 2130B**

RunID: <b>NV00922-WC_180403D</b>	QC Batch: <b>R123076</b>	PrepDate	Analyst: <b>LR</b>
Turbidity	0.20 0.10 0.10	NTU	1 4/3/2018 03:30 PM

**Qualifiers:** B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 S Spike/Surrogate outside of limits due to matrix interference  
 DO Surrogate Diluted Out  
 E Value above quantitation range  
 ND Not Detected at the Reporting Limit  
 Results are wet unless otherwise specified



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**CLIENT:** CH2M HILL  
**Work Order:** N029488  
**Project:** PG&E Topock, 680375.03.IM.OP.00

**ANALYTICAL QC SUMMARY REPORT****TestCode: 2130\_W**

Sample ID	MB-R123076	SampType:	MBLK	TestCode:	2130_W	Units:	NTU	Prep Date:		RunNo:	123076		
Client ID:	PBW	Batch ID:	R123076	TestNo:	SM 2130B			Analysis Date:	4/3/2018	SeqNo:	2976446		
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Turbidity		ND		0.10									

Sample ID	N029488-001BDUP	SampType:	DUP	TestCode:	2130_W	Units:	NTU	Prep Date:		RunNo:	123076		
Client ID:	ZZZZZZ	Batch ID:	R123076	TestNo:	SM 2130B			Analysis Date:	4/3/2018	SeqNo:	2976448		
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Turbidity		0.180		0.10						0.1900	5.41	30	

Sample ID	N029488-002BDUP	SampType:	DUP	TestCode:	2130_W	Units:	NTU	Prep Date:		RunNo:	123076		
Client ID:	ZZZZZZ	Batch ID:	R123076	TestNo:	SM 2130B			Analysis Date:	4/3/2018	SeqNo:	2976450		
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Turbidity		0.220		0.10						0.2000	9.52	30	

**Qualifiers:**

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out	Calculations are based on raw values			


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**ASSET Laboratories**
**ANALYTICAL RESULTS**
**Print Date:** 16-Apr-18

**CLIENT:** CH2M HILL  
**Lab Order:** N029488  
**Project:** PG&E Topock, 680375.03.IM.OP.00  
**Lab ID:** N029488-003

**Client Sample ID:** SC-701-WDR-571  
**Collection Date:** 4/2/2018 9:40:00 AM  
**Matrix:** WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**TOTAL MERCURY BY COLD VAPOR TECHNIQUE**
**EPA 245.1**

RunID: <b>NV00922-AA1_180406A</b>	QC Batch: <b>67475</b>	PrepDate	<b>4/5/2018</b>	Analyst: <b>CEI</b>
Mercury	ND	0.13	0.20	µg/L
			1	4/6/2018 10:33 AM

**Qualifiers:** B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 S Spike/Surrogate outside of limits due to matrix interference  
 DO Surrogate Diluted Out  
 E Value above quantitation range  
 ND Not Detected at the Reporting Limit  
 Results are wet unless otherwise specified



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**CLIENT:** CH2M HILL  
**Work Order:** N029488  
**Project:** PG&E Topock, 680375.03.IM.OP.00

**ANALYTICAL QC SUMMARY REPORT****TestCode: 245.1\_W**

Sample ID <b>MB-67475</b>	SampType: <b>MBLK</b>	TestCode: <b>245.1_W</b>	Units: <b>µg/L</b>	Prep Date: <b>4/5/2018</b>	RunNo: <b>123197</b>
Client ID: <b>PBW</b>	Batch ID: <b>67475</b>	TestNo: <b>EPA 245.1</b>		Analysis Date: <b>4/6/2018</b>	SeqNo: <b>2983178</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Mercury ND 0.20

Sample ID <b>LCS-67475</b>	SampType: <b>LCS</b>	TestCode: <b>245.1_W</b>	Units: <b>µg/L</b>	Prep Date: <b>4/5/2018</b>	RunNo: <b>123197</b>
Client ID: <b>LCSW</b>	Batch ID: <b>67475</b>	TestNo: <b>EPA 245.1</b>		Analysis Date: <b>4/6/2018</b>	SeqNo: <b>2983179</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Mercury 4.739 0.20 5.000 0 94.8 85 115

Sample ID <b>N029488-003C-MS</b>	SampType: <b>MS</b>	TestCode: <b>245.1_W</b>	Units: <b>µg/L</b>	Prep Date: <b>4/5/2018</b>	RunNo: <b>123197</b>
Client ID: <b>ZZZZZZ</b>	Batch ID: <b>67475</b>	TestNo: <b>EPA 245.1</b>		Analysis Date: <b>4/6/2018</b>	SeqNo: <b>2983180</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Mercury 4.492 0.20 5.000 0 89.8 75 125

Sample ID <b>N029488-003C-MSD</b>	SampType: <b>MSD</b>	TestCode: <b>245.1_W</b>	Units: <b>µg/L</b>	Prep Date: <b>4/5/2018</b>	RunNo: <b>123197</b>
Client ID: <b>ZZZZZZ</b>	Batch ID: <b>67475</b>	TestNo: <b>EPA 245.1</b>		Analysis Date: <b>4/6/2018</b>	SeqNo: <b>2983181</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Mercury 4.518 0.20 5.000 0 90.4 75 125 4.492 0.572 20

**Qualifiers:**

B Analyte detected in the associated Method Blank  
 ND Not Detected at the Reporting Limit  
 DO Surrogate Diluted Out  
 E Value above quantitation range  
 R RPD outside accepted recovery limits  
 H Holding times for preparation or analysis exceeded  
 S Spike/Surrogate outside of limits due to matrix interference

Calculations are based on raw values



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**ASSET Laboratories**
**ANALYTICAL RESULTS**
**Print Date:** 16-Apr-18

**CLIENT:** CH2M HILL  
**Lab Order:** N029488  
**Project:** PG&E Topock, 680375.03.IM.OP.00  
**Lab ID:** N029488-001

**Client Sample ID:** SC-100B-WDR-571  
**Collection Date:** 4/2/2018 9:30:00 AM  
**Matrix:** WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**ANIONS BY ION CHROMATOGRAPHY**
**EPA 300.0**

RunID: NV00922-IC8_180403A	QC Batch: R123087				PrepDate		Analyst: RAB
Fluoride	2.7	0.032	0.50		mg/L	5	4/3/2018 09:40 AM

**ANIONS BY ION CHROMATOGRAPHY**
**EPA 300.0**

RunID: NV00922-IC8_180403A	QC Batch: R123087				PrepDate		Analyst: RAB
Sulfate	520	1.1	25		mg/L	50	4/3/2018 11:16 AM

<b>Qualifiers:</b>	B	Analyte detected in the associated Method Blank	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
	DO	Surrogate Diluted Out		



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**ASSET Laboratories**
**ANALYTICAL RESULTS**
**Print Date:** 16-Apr-18

**CLIENT:** CH2M HILL  
**Lab Order:** N029488  
**Project:** PG&E Topock, 680375.03.IM.OP.00  
**Lab ID:** N029488-002

**Client Sample ID:** SC-700B-WDR-571  
**Collection Date:** 4/2/2018 9:40:00 AM  
**Matrix:** WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**ANIONS BY ION CHROMATOGRAPHY**
**EPA 300.0**

RunID: NV00922-IC8_180403A	QC Batch: R123087				PrepDate		Analyst: RAB
Fluoride	2.3	0.032	0.50		mg/L	5	4/3/2018 10:00 AM

**ANIONS BY ION CHROMATOGRAPHY**
**EPA 300.0**

RunID: NV00922-IC8_180403A	QC Batch: R123087				PrepDate		Analyst: RAB
Sulfate	490	1.1	25		mg/L	50	4/3/2018 11:31 AM

<b>Qualifiers:</b>	B	Analyte detected in the associated Method Blank	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
	DO	Surrogate Diluted Out		



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# ANALYTICAL RESULTS

Print Date: 16-Apr-18

CLIENT: CH2M HILL  
 Lab Order: N029488  
 Project: PG&E Topock, 680375.03.IM.OP.00  
 Lab ID: N029488-003

Client Sample ID: SC-701-WDR-571  
 Collection Date: 4/2/2018 9:40:00 AM  
 Matrix: WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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## ANIONS BY ION CHROMATOGRAPHY

### EPA 300.0

RunID: NV00922-IC8_180403A	QC Batch: R123087	PrepDate	Analyst: RAB
Fluoride	27 0.13	2.0 mg/L	20 4/3/2018 10:15 AM

**Qualifiers:** B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 S Spike/Surrogate outside of limits due to matrix interference  
 DO Surrogate Diluted Out  
 E Value above quantitation range  
 ND Not Detected at the Reporting Limit  
 Results are wet unless otherwise specified



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**CLIENT:** CH2M HILL  
**Work Order:** N029488  
**Project:** PG&E Topock, 680375.03.IM.OP.00

**ANALYTICAL QC SUMMARY REPORT****TestCode: 300\_W\_FPG**

Sample ID <b>MB-R123087_F</b>	SampType: <b>MBLK</b>	TestCode: <b>300_W_FPG</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>123087</b>
Client ID: <b>PBW</b>	Batch ID: <b>R123087</b>	TestNo: <b>EPA 300.0</b>		Analysis Date: <b>4/3/2018</b>	SeqNo: <b>2977090</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Fluoride ND 0.10

Sample ID <b>LCS-R123087_F</b>	SampType: <b>LCS</b>	TestCode: <b>300_W_FPG</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>123087</b>
Client ID: <b>LCSW</b>	Batch ID: <b>R123087</b>	TestNo: <b>EPA 300.0</b>		Analysis Date: <b>4/3/2018</b>	SeqNo: <b>2977091</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Fluoride 1.238 0.10 1.250 0 99.0 90 110

Sample ID <b>N029488-001BDUP</b>	SampType: <b>DUP</b>	TestCode: <b>300_W_FPG</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>123087</b>
Client ID: <b>ZZZZZZ</b>	Batch ID: <b>R123087</b>	TestNo: <b>EPA 300.0</b>		Analysis Date: <b>4/3/2018</b>	SeqNo: <b>2977095</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Fluoride 2.749 0.50 2.701 1.74 20

Sample ID <b>N029488-001BMS</b>	SampType: <b>MS</b>	TestCode: <b>300_W_FPG</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>123087</b>
Client ID: <b>ZZZZZZ</b>	Batch ID: <b>R123087</b>	TestNo: <b>EPA 300.0</b>		Analysis Date: <b>4/3/2018</b>	SeqNo: <b>2977096</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Fluoride 8.794 0.50 6.250 2.701 97.5 80 120

Sample ID <b>N029488-001BMSD</b>	SampType: <b>MSD</b>	TestCode: <b>300_W_FPG</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>123087</b>
Client ID: <b>ZZZZZZ</b>	Batch ID: <b>R123087</b>	TestNo: <b>EPA 300.0</b>		Analysis Date: <b>4/3/2018</b>	SeqNo: <b>2977097</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Fluoride 8.845 0.50 6.250 2.701 98.3 80 120 8.794 0.578 20

**Qualifiers:**

B Analyte detected in the associated Method Blank E Value above quantitation range H Holding times for preparation or analysis exceeded  
 ND Not Detected at the Reporting Limit R RPD outside accepted recovery limits S Spike/Surrogate outside of limits due to matrix interference  
 DO Surrogate Diluted Out

Calculations are based on raw values



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**CLIENT:** CH2M HILL  
**Work Order:** N029488  
**Project:** PG&E Topock, 680375.03.IM.OP.00

## ANALYTICAL QC SUMMARY REPORT

**TestCode:** 300\_W\_SO4PGE

Sample ID	MB-R123087_SO4	SampType:	MBLK	TestCode:	300_W_SO4P	Units:	mg/L	Prep Date:		RunNo:	123087			
Client ID:	PBW	Batch ID:	R123087	TestNo:	EPA 300.0			Analysis Date:	4/3/2018	SeqNo:	2977106			
Analyte		Result		PQL	SPK value	SPK Ref Val		%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Sulfate ND 0.50

Sample ID	LCS-R123087_SO4	SampType:	LCS	TestCode:	300_W_SO4P	Units:	mg/L	Prep Date:		RunNo:	123087			
Client ID:	LCSW	Batch ID:	R123087	TestNo:	EPA 300.0			Analysis Date:	4/3/2018	SeqNo:	2977107			
Analyte		Result		PQL	SPK value	SPK Ref Val		%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Sulfate 4.005 0.50 4.000 0 100 90 110

Sample ID	N029488-001BDUP	SampType:	DUP	TestCode:	300_W_SO4P	Units:	mg/L	Prep Date:		RunNo:	123087			
Client ID:	ZZZZZZ	Batch ID:	R123087	TestNo:	EPA 300.0			Analysis Date:	4/3/2018	SeqNo:	2977112			
Analyte		Result		PQL	SPK value	SPK Ref Val		%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Sulfate 516.845 25 517.0 0.0310 20

Sample ID	N029488-001BMS	SampType: MS	TestCode: 300_W_SO4P	Units: mg/L	Prep Date:	RunNo: 123087					
Client ID: ZZZZZZ	Batch ID: R123087	TestNo: EPA 300.0	Analysis Date: 4/3/2018	SeqNo: 2977113							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Sulfate 721.140 25 200.0 517.0 102 80 120

Sample ID	N029488-001BMSD	SampType:	MSD	TestCode:	300_W_SO4P	Units:	mg/L	Prep Date:		RunNo:	123087			
Client ID:	ZZZZZZ	Batch ID:	R123087	TestNo:	EPA 300.0			Analysis Date:	4/3/2018	SeqNo:	2977114			
Analyte		Result		PQL	SPK value	SPK Ref Val		%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Sulfate 721.270 25 200.0 517.0 102 80 120 721.1 0.0180 20

### Qualifiers:

- |    |   |                                      |                                      |   |  |
|----|---|--------------------------------------|--------------------------------------|---|--|
| B  | Analyte detected in the associated Method Blank | E                                    | Value above quantitation range       | H | Holding times for preparation or analysis exceeded           |
| ND | Not Detected at the Reporting Limit             | R                                    | RPD outside accepted recovery limits | S | Spike/Surrogate outside of limits due to matrix interference |
| DO | Surrogate Diluted Out                           | Calculations are based on raw values |                                      |   |  |



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**ASSET Laboratories**
**ANALYTICAL RESULTS**
**Print Date:** 16-Apr-18

**CLIENT:** CH2M HILL  
**Lab Order:** N029488  
**Project:** PG&E Topock, 680375.03.IM.OP.00  
**Lab ID:** N029488-001

**Client Sample ID:** SC-100B-WDR-571  
**Collection Date:** 4/2/2018 9:30:00 AM  
**Matrix:** WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**NITRATE/NITRITE-N BY CADMIUM REDUCTION**
**SM4500-NO3F**

RunID: <b>NV00922-WC_180404B</b>	QC Batch: <b>R123102</b>			PrepDate			Analyst: <b>QBM</b>
Nitrate/Nitrite as N	2.8	0.16	0.25	mg/L	5		4/4/2018

**Qualifiers:** B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 S Spike/Surrogate outside of limits due to matrix interference  
 DO Surrogate Diluted Out  
 E Value above quantitation range  
 ND Not Detected at the Reporting Limit  
 Results are wet unless otherwise specified



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**ASSET Laboratories**
**ANALYTICAL RESULTS**
**Print Date:** 16-Apr-18

**CLIENT:** CH2M HILL  
**Lab Order:** N029488  
**Project:** PG&E Topock, 680375.03.IM.OP.00  
**Lab ID:** N029488-002

**Client Sample ID:** SC-700B-WDR-571  
**Collection Date:** 4/2/2018 9:40:00 AM  
**Matrix:** WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**NITRATE/NITRITE-N BY CADMIUM REDUCTION**
**SM4500-NO3F**

RunID: <b>NV00922-WC_180404B</b>	QC Batch: <b>R123102</b>			PrepDate		Analyst: <b>QBM</b>
Nitrate/Nitrite as N	2.5	0.16	0.25	mg/L	5	4/4/2018

**Qualifiers:** B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 S Spike/Surrogate outside of limits due to matrix interference  
 DO Surrogate Diluted Out  
 E Value above quantitation range  
 ND Not Detected at the Reporting Limit  
 Results are wet unless otherwise specified



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**CLIENT:** CH2M HILL  
**Work Order:** N029488  
**Project:** PG&E Topock, 680375.03.IM.OP.00

**ANALYTICAL QC SUMMARY REPORT****TestCode: 4500N03F\_W**

Sample ID <b>MB-R123102</b>	SampType: <b>MBLK</b>	TestCode: <b>4500N03F_W</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>123102</b>
Client ID: <b>PBW</b>	Batch ID: <b>R123102</b>	TestNo: <b>SM4500-NO3</b>		Analysis Date: <b>4/4/2018</b>	SeqNo: <b>2977462</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual
Nitrate/Nitrite as N	ND	0.050			

Sample ID <b>LCS-R123102</b>	SampType: <b>LCS</b>	TestCode: <b>4500N03F_W</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>123102</b>
Client ID: <b>LCSW</b>	Batch ID: <b>R123102</b>	TestNo: <b>SM4500-NO3</b>		Analysis Date: <b>4/4/2018</b>	SeqNo: <b>2977463</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual
Nitrate/Nitrite as N	0.471	0.050	0.5000	0	94.2 85 115

Sample ID <b>N029477-001CDUP</b>	SampType: <b>DUP</b>	TestCode: <b>4500N03F_W</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>123102</b>
Client ID: <b>ZZZZZZ</b>	Batch ID: <b>R123102</b>	TestNo: <b>SM4500-NO3</b>		Analysis Date: <b>4/4/2018</b>	SeqNo: <b>2977467</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual
Nitrate/Nitrite as N	9.703	0.50			9.738 0.360 20

Sample ID <b>N029496-001CMS</b>	SampType: <b>MS</b>	TestCode: <b>4500N03F_W</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>123102</b>
Client ID: <b>ZZZZZZ</b>	Batch ID: <b>R123102</b>	TestNo: <b>SM4500-NO3</b>		Analysis Date: <b>4/4/2018</b>	SeqNo: <b>2977469</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual
Nitrate/Nitrite as N	13.094	0.50	5.000	8.136	99.2 75 125

Sample ID <b>N029496-001CMSD</b>	SampType: <b>MSD</b>	TestCode: <b>4500N03F_W</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>123102</b>
Client ID: <b>ZZZZZZ</b>	Batch ID: <b>R123102</b>	TestNo: <b>SM4500-NO3</b>		Analysis Date: <b>4/4/2018</b>	SeqNo: <b>2977470</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual
Nitrate/Nitrite as N	12.613	0.50	5.000	8.136	89.5 75 125 13.09 3.74 20

**Qualifiers:**

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out	Calculations are based on raw values			



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## CH2MHILL

## CHAIN OF CUSTODY RECORD

Page 1 OF 1

<b>Project Name</b> PG&E Topock <b>Location</b> PG&E Topock <b>Project Number</b> 680375.03.IM.OP.00 <b>Project Manager</b> Scott O'Donnell <b>Sample Manager</b> Shawn Duffy  <b>Task Order</b> <b>Project</b> IM3PLANT-ARAR-WDR-571 <b>Turnaround Time</b> 10 Days <b>Shipping Date:</b> <b>COC Number:</b> 571			<b>Container:</b> 1 Liter Poly <b>Preservatives:</b> 4°C Lab H2SO4 <b>Filtered:</b> NA <b>Holding Time:</b> 28	1 Liter Poly 4°C NA 7	1 Liter Poly 4°C NA 7	1 Liter Poly 4°C NA 7	250 ml Poly 4°C NA 1	1 Liter Poly 4°C Lab H2SO4 NA 28	1 Liter Poly 4°C NA 7	500 ml Poly 4°C NA 180	500 ml Poly 4°C NA 180	500 ml Poly 4°C NA 180	1 Liter Poly 4°C NA 7	Number of Containers	COMMENTS
AMMONIA (SM4500NH3D) Anions (E300.0) FI & SO4 Anions (E300.0) Fluoride CONDUCTIVITY (E120.1) E218.6 Lab Filtered Nitrate/Nitrite (SM4500NO3-E) TDS (SM2540C) Total Metals (E200.7 and E200.8) Total Metals (E200.8 Mn) Total Title22Metals Turbidity (SM2130)															
DATE	TIME	Matrix													
SC-100B-WDR-571	4-2-18	9:30	Water	X	X		X	X	X	X		X	N029488-01		
SC-700B-WDR-571	4-2-18	9:40	Water	X	X		X	X	X	X		X	-02	4	
SC-701-WDR-571	4-2-18	9:40	Water			X	X	X		X		X	-03	3	
TOTAL NUMBER OF CONTAINERS													11		

<b>Signatures</b> Approved by  Sampled by  Relinquished by  Received by  Relinquished by  Received by 	<b>Date/Time</b> 9:00 4-2-18 9:42 4-2-18 4-2-18 1300 4-2-18 1300 4/2/18 4/2/18 1906	<b>Shipping Details</b> Method of Shipment: FedEx On Ice: yes / no 2-9-02 Airbill No: 1R42 Lab Name: ASSET Laboratories Lab Phone: (702) 307-2659	<b>ATTN:</b> Sample Custody and Marlon Cartin	<b>Special Instructions:</b> The SC-100B & SC-700B Total metals List: Cr,Al,Sb,As,Ba,B,Cu,Pb,Mn,Mo,Ni,Fe,Zn  Report Copy to Doug Scott (970) 731-0636
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## ASSET Laboratories

Please review the checklist below. Any NO signifies non-compliance. Any non-compliance will be noted and must be understood as having an impact on the quality of the data. All tests will be performed as requested regardless of any compliance issues.

If you have any questions or further instruction, please contact our Project Coordinator at (702) 307-2659.

Cooler Received/Opened On: 4/2/2018 Workorder: N029488  
 Rep sample Temp (Deg C): 2.9 IR Gun ID: 2  
 Temp Blank: ☒ Yes ☐ No  
 Carrier name: ASSET  
 Last 4 digits of Tracking No.: NA Packing Material Used: None  
 Cooling process: ☒ Ice ☐ Ice Pack ☐ Dry Ice ☐ Other ☐ None

### Sample Receipt Checklist

1. Shipping container/cooler in good condition?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
2. Custody seals intact, signed, dated on shipping container/cooler?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
3. Custody seals intact on sample bottles?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
4. Chain of custody present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
5. Sampler's name present in COC?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
6. Chain of custody signed when relinquished and received?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
7. Chain of custody agrees with sample labels?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
8. Samples in proper container/bottle?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
9. Sample containers intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
10. Sufficient sample volume for indicated test?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
11. All samples received within holding time?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
12. Temperature of rep sample or Temp Blank within acceptable limit?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	NA <input type="checkbox"/>
13. Water - VOA vials have zero headspace?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	NA <input checked="" type="checkbox"/>
14. Water - pH acceptable upon receipt? Example: pH > 12 for (CN,S); pH<2 for Metals	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	NA <input type="checkbox"/>
15. Did the bottle labels indicate correct preservatives used?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	NA <input checked="" type="checkbox"/>
16. Were there Non-Conformance issues at login?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	NA <input type="checkbox"/>
Was Client notified?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	NA <input checked="" type="checkbox"/>

Comments: Samples for Hex Cr were lab filtered and preserved with Ammonium buffer.  
 Samples for Metals were lab preserved with HN03 and for NH3/NO3 with H2SO4, pH adjusted to <2.

Checklist Completed By: YR  4/12/2018

Reviewed By:  4/16/2018



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TEL: 7023072659

FAX: 7023072691

## CHAIN-OF-CUSTODY RECORD

Page 1 of 1

**QC Level: Level IV**

**Subcontractor:**

BC Labs  
4100 Atlas Court  
Bakersfield, CA 93308

TEL: (661) 327-4911  
FAX: (661) 327-1918  
Acct #:

Field Sampler: SIGNED

**03-Apr-18**


Sample ID	Matrix	Date Collected	Bottle Type	Requested Tests		
				SM4500-NH3D		
N029488-001A / SC-100B-WDR-571	Water	4/2/2018 9:30:00 AM	32OZP	1		
N029488-002A / SC-700B-WDR-571	Water	4/2/2018 9:40:00 AM	32OZP	1		

General Comments: Please email sample receipt acknowledgement to the PM.

Please use PO#:N29488A Please email Invoices and Account Receivable Statements to elvira@assetlaboratories.com. For questions, call Marlon at (702)-307-2659. Please e-mail results to reports.lv@assetlaboratories.com by: Normal TAT.

Please analyze for Ammonia by SM4500NH3D. EDD Requirement LabSpec7 edata.

GSO #: 540063040

	<b>Date/Time</b>		<b>Date/Time</b>
Relinquished by: 	4/3/2018 17:00	Received by: _____	
Relinquished by: _____		Received by: _____	



## List of Analysts

### ASSET Laboratories Work Order: N029488

NAME	TEST METHOD
Quennie Manimtim	SM 4500-NO3F
Claire Ignacio	EPA 200.7, EPA 200.8, EPA 245.1
Ria Abes	EPA 218.6, EPA 300.0
Lilia Ramit	EPA 120.1, SM 2540C, SM 2130B



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"Serving Clients with Passion and Professionalism"

April 16, 2018

Doug Scott  
CH2M HILL  
155 Grand Avenue, Suite 1000  
Oakland, CA 94612  
TEL: (970) 731-0636  
FAX: (510) 622-9129

Workorder No.: N029489

RE: PG&E Topock, 680375.03.IM.OP.00


Attention: Doug Scott

Enclosed are the results for sample(s) received on April 02, 2018 by ASSET Laboratories . The sample(s) are tested for the parameters as indicated in the enclosed chain of custody in accordance with the applicable laboratory certifications.

Thank you for the opportunity to service the needs of your company.

Please feel free to call me at (702) 307-2659 if I can be of further assistance to your company.

Sincerely,

 Tor

Quennie Manimtim  
Laboratory Director

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**CLIENT:** CH2M HILL  
**Project:** PG&E Topock, 680375.03.IM.OP.00  
**Lab Order:** N029489

**CASE NARRATIVE****SAMPLE RECEIVING/GENERAL COMMENTS:**

All sample containers were received intact with proper chain of custody documentation.

Information on sample receipt conditions including discrepancies can be found in attached Sample Receipt Checklist Form.

Cooler temperature and sample preservation were verified upon receipt of samples if applicable.

Samples were analyzed within method holding time.

**Analytical Comments for EPA 300.0:**

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) are outside recovery criteria in QC samples N029489-001AMS and N029489-001AMSD possibly due to matrix interference. The associated Laboratory Control Sample (LCS) recovery was acceptable.

**Analytical Comments for EPA 7471A:**

Matrix Spike (MS) is outside recovery criteria in QC sample N029485-015B-MS possibly due to matrix interference. The associated Laboratory Control Sample (LCS) recovery was acceptable.



## ASSET Laboratories

Date: 16-Apr-18

**CLIENT:** CH2M HILL  
**Project:** PG&E Topock, 680375.03.IM.OP.00  
**Lab Order:** N029489  
**Contract No:** IM3PLANT-AR

### Work Order Sample Summary

Lab Sample ID	Client Sample ID	Matrix	Collection Date	Date Received	Date Reported
N029489-001A	Phase Separator-571-Sludge	Soil	4/2/2018 9:15:00 AM	4/2/2018	4/16/2018
N029489-001B	Phase Separator-571-Sludge	Soil	4/2/2018 9:15:00 AM	4/2/2018	4/16/2018



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# ASSET Laboratories

# ANALYTICAL RESULTS

Print Date: 16-Apr-18

<b>CLIENT:</b>	CH2M HILL	<b>Client Sample ID:</b>	Phase Separator-571-Sludge
<b>Lab Order:</b>	N029489	<b>Collection Date:</b>	4/2/2018 9:15:00 AM
<b>Project:</b>	PG&E Topock, 680375.03.IM.OP.00	<b>Matrix:</b>	SOIL
<b>Lab ID:</b>	N029489-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
----------	--------	-----	-----	------	-------	----	---------------

## ANIONS BY ION CHROMATOGRAPHY

### EPA 300.0

RunID: <b>NV00922-IC8_180410B</b>	QC Batch: <b>R123271</b>	PrepDate	Analyst: <b>RAB</b>
Fluoride	55 0.73	10	mg/Kg-dry 5 4/10/2018 02:56 PM

<b>Qualifiers:</b>	B	Analyte detected in the associated Method Blank	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
	DO	Surrogate Diluted Out		



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**CLIENT:** CH2M HILL  
**Work Order:** N029489  
**Project:** PG&E Topock, 680375.03.IM.OP.00

**ANALYTICAL QC SUMMARY REPORT****TestCode: 300\_S**

Sample ID <b>MB-R123271</b>	SampType: <b>MBLK</b>	TestCode: <b>300_S</b>	Units: <b>mg/Kg</b>	Prep Date:	RunNo: <b>123271</b>
Client ID: <b>PBS</b>	Batch ID: <b>R123271</b>	TestNo: <b>EPA 300.0</b>		Analysis Date: <b>4/10/2018</b>	SeqNo: <b>2987670</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Fluoride ND 1.0

Sample ID <b>LCS-R123271</b>	SampType: <b>LCS</b>	TestCode: <b>300_S</b>	Units: <b>mg/Kg</b>	Prep Date:	RunNo: <b>123271</b>
Client ID: <b>LCSS</b>	Batch ID: <b>R123271</b>	TestNo: <b>EPA 300.0</b>		Analysis Date: <b>4/10/2018</b>	SeqNo: <b>2987671</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Fluoride 13.282 1.0 12.50 0 106 90 110

Sample ID <b>N029489-001ADUP</b>	SampType: <b>DUP</b>	TestCode: <b>300_S</b>	Units: <b>mg/Kg-dry</b>	Prep Date:	RunNo: <b>123271</b>
Client ID: <b>ZZZZZZ</b>	Batch ID: <b>R123271</b>	TestNo: <b>EPA 300.0</b>		Analysis Date: <b>4/10/2018</b>	SeqNo: <b>2987673</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Fluoride 53.581 10 55.47 3.46 20

Sample ID <b>N029489-001AMS</b>	SampType: <b>MS</b>	TestCode: <b>300_S</b>	Units: <b>mg/Kg-dry</b>	Prep Date:	RunNo: <b>123271</b>
Client ID: <b>ZZZZZZ</b>	Batch ID: <b>R123271</b>	TestNo: <b>EPA 300.0</b>		Analysis Date: <b>4/10/2018</b>	SeqNo: <b>2987674</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Fluoride 73.235 10 26.07 55.47 68.2 80 120 S

Sample ID <b>N029489-001AMSD</b>	SampType: <b>MSD</b>	TestCode: <b>300_S</b>	Units: <b>mg/Kg-dry</b>	Prep Date:	RunNo: <b>123271</b>
Client ID: <b>ZZZZZZ</b>	Batch ID: <b>R123271</b>	TestNo: <b>EPA 300.0</b>		Analysis Date: <b>4/10/2018</b>	SeqNo: <b>2987675</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Fluoride 72.307 10 26.07 55.47 64.6 80 120 73.24 1.28 20 S

**Qualifiers:**

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out	Calculations are based on raw values			



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CLIENT: CH2M HILL  
Work Order: N029489  
Project: PG&E Topock, 680375.03.IM.OP.00

## ANALYTICAL QC SUMMARY REPORT

TestCode: 300\_S

Sample ID	N029489-001APS	SampType:	MS	TestCode:	300_S	Units:	mg/Kg-dry	Prep Date:		RunNo:	123271	
Client ID:	ZZZZZZ	Batch ID:	R123271	TestNo:	EPA 300.0			Analysis Date:	4/10/2018	SeqNo:	2987678	
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride		183.328	10	130.3	55.47	98.1	80	120				

### Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		



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**ASSET Laboratories**
**ANALYTICAL RESULTS**
**Print Date:** 16-Apr-18

**CLIENT:** CH2M HILL  
**Lab Order:** N029489  
**Project:** PG&E Topock, 680375.03.IM.OP.00  
**Lab ID:** N029489-001

**Client Sample ID:** Phase Separator-571-Sludge  
**Collection Date:** 4/2/2018 9:15:00 AM  
**Matrix:** SOIL

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**TOTAL METALS BY ICP**
**EPA 3050B**
**EPA 6010B**

RunID: NV00922-ICP2_180403A	QC Batch: 67431	PrepDate	4/3/2018	Analyst: CEI
Antimony	6.0	0.69	4.2	mg/Kg-dry
Arsenic	13	1.1	2.1	mg/Kg-dry
Barium	65	0.65	2.1	mg/Kg-dry
Beryllium	ND	0.45	2.1	mg/Kg-dry
Cadmium	ND	0.55	2.1	mg/Kg-dry
Chromium	2900	0.67	2.1	mg/Kg-dry
Cobalt	4.0	0.60	2.1	mg/Kg-dry
Copper	140	1.9	4.2	mg/Kg-dry
Lead	ND	0.61	2.1	mg/Kg-dry
Manganese	380	1.1	2.1	mg/Kg-dry
Molybdenum	3.4	0.62	2.1	mg/Kg-dry
Nickel	30	0.71	2.1	mg/Kg-dry
Selenium	ND	1.2	2.1	mg/Kg-dry
Silver	ND	1.3	2.1	mg/Kg-dry
Thallium	5.9	0.74	4.2	mg/Kg-dry
Vanadium	36	0.46	2.1	mg/Kg-dry
Zinc	37	0.62	2.1	mg/Kg-dry

**Qualifiers:** B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 S Spike/Surrogate outside of limits due to matrix interference  
 DO Surrogate Diluted Out  
 E Value above quantitation range  
 ND Not Detected at the Reporting Limit  
 Results are wet unless otherwise specified



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**CLIENT:** CH2M HILL  
**Work Order:** N029489  
**Project:** PG&E Topock, 680375.03.IM.OP.00

**ANALYTICAL QC SUMMARY REPORT****TestCode: 6010\_SPGE**

Sample ID	MB-67431	SampType:	MBLK	TestCode:	6010_SPGE	Units:	mg/Kg	Prep Date:	4/3/2018	RunNo:	123107		
Client ID:	PBS	Batch ID:	67431	TestNo:	EPA 6010B	EPA 3050B		Analysis Date:	4/3/2018	SeqNo:	2977943		
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony		ND		2.0									
Arsenic		ND		1.0									
Barium		ND		1.0									
Beryllium		ND		1.0									
Cadmium		ND		1.0									
Chromium		ND		1.0									
Cobalt		ND		1.0									
Copper		ND		2.0									
Lead		ND		1.0									
Manganese		ND		1.0									
Molybdenum		ND		1.0									
Nickel		ND		1.0									
Selenium		ND		1.0									
Silver		ND		1.0									
Thallium		ND		2.0									
Vanadium		ND		1.0									
Zinc		ND		1.0									

Sample ID	LCS-67431	SampType: LCS	TestCode: 6010_SPGE	Units: mg/Kg	Prep Date: 4/3/2018	RunNo: 123107					
Client ID:	LCSS	Batch ID: 67431	TestNo: EPA 6010B	EPA 3050B	Analysis Date: 4/3/2018	SeqNo: 2977946					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	25.496	2.0	25.00	0	102	85	115				
Arsenic	24.911	1.0	25.00	0	99.6	85	115				
Barium	25.537	1.0	25.00	0	102	85	115				
Beryllium	24.995	1.0	25.00	0	100	85	115				
Cadmium	25.245	1.0	25.00	0	101	85	115				
Chromium	25.278	1.0	25.00	0	101	85	115				

**Qualifiers:**

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out	Calculations are based on raw values			



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**CLIENT:** CH2M HILL  
**Work Order:** N029489  
**Project:** PG&E Topock, 680375.03.IM.OP.00

## ANALYTICAL QC SUMMARY REPORT

**TestCode:** 6010\_SPGE

Sample ID	<b>LCS-67431</b>	SampType:	<b>LCS</b>	TestCode:	<b>6010_SPGE</b>	Units:	<b>mg/Kg</b>	Prep Date:	<b>4/3/2018</b>	RunNo:	<b>123107</b>
Client ID:	<b>LCSS</b>	Batch ID:	<b>67431</b>	TestNo:	<b>EPA 6010B EPA 3050B</b>			Analysis Date:	<b>4/3/2018</b>	SeqNo:	<b>2977946</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cobalt	25.246	1.0	25.00	0	101	85	115				
Copper	25.458	2.0	25.00	0	102	85	115				
Lead	25.479	1.0	25.00	0	102	85	115				
Manganese	49.880	1.0	50.00	0	99.8	85	115				
Molybdenum	25.172	1.0	25.00	0	101	85	115				
Nickel	25.133	1.0	25.00	0	101	85	115				
Selenium	24.805	1.0	25.00	0	99.2	85	115				
Silver	25.291	1.0	25.00	0	101	85	115				
Thallium	25.323	2.0	25.00	0	101	85	115				
Vanadium	25.242	1.0	25.00	0	101	85	115				
Zinc	25.007	1.0	25.00	0	100	85	115				

Sample ID	<b>N029485-005B-MS</b>	SampType:	<b>MS</b>	TestCode:	<b>6010_SPGE</b>	Units:	<b>mg/Kg-dry</b>	Prep Date:	<b>4/3/2018</b>	RunNo:	<b>123107</b>
Client ID:	<b>ZZZZZZ</b>	Batch ID:	<b>67431</b>	TestNo:	<b>EPA 6010B EPA 3050B</b>			Analysis Date:	<b>4/3/2018</b>	SeqNo:	<b>2977950</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	38.750	3.0	37.57	0	103	75	125				
Arsenic	39.553	1.5	37.57	5.595	90.4	75	125				
Barium	180.573	1.5	37.57	148.4	85.7	75	125				
Beryllium	31.028	1.5	37.57	0	82.6	75	125				
Cadmium	31.027	1.5	37.57	0.6075	81.0	75	125				
Chromium	109.258	1.5	37.57	76.68	86.7	75	125				
Cobalt	47.857	1.5	37.57	14.52	88.7	75	125				
Copper	77.726	3.0	37.57	42.98	92.5	75	125				
Lead	37.476	1.5	37.57	6.740	81.8	75	125				
Manganese	356.950	1.5	75.14	288.1	91.7	75	125				
Molybdenum	32.763	1.5	37.57	0	87.2	75	125				
Nickel	110.343	1.5	37.57	80.03	80.7	75	125				
Selenium	32.807	1.5	37.57	0	87.3	75	125				
Silver	36.103	1.5	37.57	0	96.1	75	125				

### Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out	Calculations are based on raw values			



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**CLIENT:** CH2M HILL  
**Work Order:** N029489  
**Project:** PG&E Topock, 680375.03.IM.OP.00

## ANALYTICAL QC SUMMARY REPORT

**TestCode: 6010\_SPGE**

Sample ID	N029485-005B-MS	SampType: MS	TestCode: 6010_SPGE	Units: mg/Kg-dry	Prep Date: 4/3/2018	RunNo: 123107					
Client ID:	ZZZZZZ	Batch ID: 67431	TestNo: EPA 6010B	EPA 3050B	Analysis Date: 4/3/2018	SeqNo: 2977950					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Thallium	31.222	3.0	37.57	1.449	79.3	75	125				
Vanadium	114.381	1.5	37.57	82.45	85.0	75	125				
Zinc	123.922	1.5	37.57	93.30	81.5	75	125				

Sample ID	N029485-005B-MSD	SampType: MSD	TestCode: 6010_SPGE	Units: mg/Kg-dry	Prep Date: 4/3/2018	RunNo: 123107					
Client ID: ZZZZZZ	Batch ID: 67431	TestNo: EPA 6010B	EPA 3050B	Analysis Date: 4/3/2018	SeqNo: 2977951						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	38.136	3.0	37.51	0	102	75	125	38.75	1.60	20	
Arsenic	38.665	1.5	37.51	5.595	88.2	75	125	39.55	2.27	20	
Barium	180.419	1.5	37.51	148.4	85.4	75	125	180.6	0.0853	20	
Beryllium	30.462	1.5	37.51	0	81.2	75	125	31.03	1.84	20	
Cadmium	31.075	1.5	37.51	0.6075	81.2	75	125	31.03	0.154	20	
Chromium	109.167	1.5	37.51	76.68	86.6	75	125	109.3	0.0831	20	
Cobalt	47.424	1.5	37.51	14.52	87.7	75	125	47.86	0.911	20	
Copper	77.629	3.0	37.51	42.98	92.4	75	125	77.73	0.125	20	
Lead	37.105	1.5	37.51	6.740	80.9	75	125	37.48	0.994	20	
Manganese	345.345	1.5	75.02	288.1	76.3	75	125	357.0	3.30	20	
Molybdenum	32.547	1.5	37.51	0	86.8	75	125	32.76	0.662	20	
Nickel	110.154	1.5	37.51	80.03	80.3	75	125	110.3	0.172	20	
Selenium	32.271	1.5	37.51	0	86.0	75	125	32.81	1.65	20	
Silver	36.151	1.5	37.51	0	96.4	75	125	36.10	0.132	20	
Thallium	30.740	3.0	37.51	1.449	78.1	75	125	31.22	1.56	20	
Vanadium	114.449	1.5	37.51	82.45	85.3	75	125	114.4	0.0597	20	
Zinc	123.570	1.5	37.51	93.30	80.7	75	125	123.9	0.284	20	

### Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out	Calculations are based on raw values			



**ASSET LABORATORIES**

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# ASSET Laboratories

# ANALYTICAL RESULTS

Print Date: 16-Apr-18

CLIENT:	CH2M HILL	Client Sample ID:	Phase Separator-571-Sludge
Lab Order:	N029489	Collection Date:	4/2/2018 9:15:00 AM
Project:	PG&E Topock, 680375.03.IM.OP.00	Matrix:	SOIL
Lab ID:	N029489-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
<b>HEXAVALENT CHROMIUM BY IC</b>							
	<b>EPA 3060A</b>			<b>EPA 7199</b>			
RunID: <b>NV00922-IC6_180405A</b>	QC Batch: <b>67488</b>			PrepDate	<b>4/5/2018</b>	Analyst: <b>RAB</b>	
Hexavalent Chromium	49	0.61	2.1		mg/Kg-dry	5	4/5/2018 03:50 PM

Qualifiers:	B	Analyte detected in the associated Method Blank	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
	DO	Surrogate Diluted Out		



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**CLIENT:** CH2M HILL  
**Work Order:** N029489  
**Project:** PG&E Topock, 680375.03.IM.OP.00

**ANALYTICAL QC SUMMARY REPORT****TestCode: 7199\_S\_PGE**

Sample ID <b>MB-67488</b>	SampType: <b>MBLK</b>	TestCode: <b>7199_S_PGE</b>	Units: <b>mg/Kg</b>	Prep Date: <b>4/5/2018</b>	RunNo: <b>123155</b>
Client ID: <b>PBS</b>	Batch ID: <b>67488</b>	TestNo: <b>EPA 7199</b>	<b>EPA 3060A</b>	Analysis Date: <b>4/5/2018</b>	SeqNo: <b>2980438</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Hexavalent Chromium ND 0.20

Sample ID <b>LCS-67488</b>	SampType: <b>LCS</b>	TestCode: <b>7199_S_PGE</b>	Units: <b>mg/Kg</b>	Prep Date: <b>4/5/2018</b>	RunNo: <b>123155</b>
Client ID: <b>LCS</b>	Batch ID: <b>67488</b>	TestNo: <b>EPA 7199</b>	<b>EPA 3060A</b>	Analysis Date: <b>4/5/2018</b>	SeqNo: <b>2980439</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Hexavalent Chromium 3.892 0.20 4.000 0 97.3 80 120

Sample ID <b>N029489-001A-REP</b>	SampType: <b>DUP</b>	TestCode: <b>7199_S_PGE</b>	Units: <b>mg/Kg-dry</b>	Prep Date: <b>4/5/2018</b>	RunNo: <b>123155</b>
Client ID: <b>ZZZZZ</b>	Batch ID: <b>67488</b>	TestNo: <b>EPA 7199</b>	<b>EPA 3060A</b>	Analysis Date: <b>4/5/2018</b>	SeqNo: <b>2980441</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Hexavalent Chromium 47.211 2.1 48.67 3.04 20

Sample ID <b>N029554-003A-REP</b>	SampType: <b>DUP</b>	TestCode: <b>7199_S_PGE</b>	Units: <b>mg/Kg-dry</b>	Prep Date: <b>4/5/2018</b>	RunNo: <b>123155</b>
Client ID: <b>ZZZZZ</b>	Batch ID: <b>67488</b>	TestNo: <b>EPA 7199</b>	<b>EPA 3060A</b>	Analysis Date: <b>4/5/2018</b>	SeqNo: <b>2980443</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Hexavalent Chromium 0.359 0.26 0.3564 0.628 20

Sample ID <b>N029554-003A-DUP</b>	SampType: <b>DUP</b>	TestCode: <b>7199_S_PGE</b>	Units: <b>mg/Kg-dry</b>	Prep Date: <b>4/5/2018</b>	RunNo: <b>123155</b>
Client ID: <b>ZZZZZ</b>	Batch ID: <b>67488</b>	TestNo: <b>EPA 7199</b>	<b>EPA 3060A</b>	Analysis Date: <b>4/5/2018</b>	SeqNo: <b>2980444</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Hexavalent Chromium 0.354 0.26 0.3564 0.661 20

**Qualifiers:**

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
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DO	Surrogate Diluted Out	Calculations are based on raw values			



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"Serving Clients with Passion and Professionalism"

**CLIENT:** CH2M HILL  
**Work Order:** N029489  
**Project:** PG&E Topock, 680375.03.IM.OP.00

## ANALYTICAL QC SUMMARY REPORT

**TestCode:** 7199\_S\_PGE

Sample ID	<b>N029554-003A-MS</b>	SampType:	<b>MS</b>	TestCode:	<b>7199_S_PGE</b>	Units:	<b>mg/Kg-dry</b>	Prep Date:	<b>4/5/2018</b>	RunNo:	<b>123155</b>
Client ID:	<b>ZZZZZZ</b>	Batch ID:	<b>67488</b>	TestNo:	<b>EPA 7199</b>	<b>EPA 3060A</b>		Analysis Date:	<b>4/5/2018</b>	SeqNo:	<b>2980445</b>
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD RPDLimit Qual

Hexavalent Chromium 5.429 0.26 5.116 0.3564 99.1 75 125

Sample ID	<b>N029554-003A-MSD</b>	SampType:	<b>MSD</b>	TestCode:	<b>7199_S_PGE</b>	Units:	<b>mg/Kg-dry</b>	Prep Date:	<b>4/5/2018</b>	RunNo:	<b>123155</b>
Client ID:	<b>ZZZZZZ</b>	Batch ID:	<b>67488</b>	TestNo:	<b>EPA 7199</b>	<b>EPA 3060A</b>		Analysis Date:	<b>4/5/2018</b>	SeqNo:	<b>2980446</b>
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD RPDLimit Qual

Hexavalent Chromium 5.295 0.25 5.100 0.3564 96.8 75 125 5.429 2.50 20

Sample ID	<b>N029554-003A-MS I</b>	SampType:	<b>MS</b>	TestCode:	<b>7199_S_PGE</b>	Units:	<b>mg/Kg-dry</b>	Prep Date:	<b>4/5/2018</b>	RunNo:	<b>123155</b>
Client ID:	<b>ZZZZZZ</b>	Batch ID:	<b>67488</b>	TestNo:	<b>EPA 7199</b>	<b>EPA 3060A</b>		Analysis Date:	<b>4/5/2018</b>	SeqNo:	<b>2980447</b>
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD RPDLimit Qual

Hexavalent Chromium 850.372 13 831.0 0.3564 102 75 125

Sample ID	<b>N029554-002A-REP</b>	SampType:	<b>DUP</b>	TestCode:	<b>7199_S_PGE</b>	Units:	<b>mg/Kg-dry</b>	Prep Date:	<b>4/5/2018</b>	RunNo:	<b>123155</b>
Client ID:	<b>ZZZZZZ</b>	Batch ID:	<b>67488</b>	TestNo:	<b>EPA 7199</b>	<b>EPA 3060A</b>		Analysis Date:	<b>4/5/2018</b>	SeqNo:	<b>2980451</b>
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD RPDLimit Qual

Hexavalent Chromium 1.275 0.27 1.302 2.11 20

Sample ID	<b>N029554-003A-PS</b>	SampType:	<b>MS</b>	TestCode:	<b>7199_S_PGE</b>	Units:	<b>mg/Kg-dry</b>	Prep Date:		RunNo:	<b>123155</b>
Client ID:	<b>ZZZZZZ</b>	Batch ID:	<b>67488</b>	TestNo:	<b>EPA 7199</b>	<b>EPA 3060A</b>		Analysis Date:	<b>4/5/2018</b>	SeqNo:	<b>2980452</b>
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD RPDLimit Qual

Hexavalent Chromium 5.719 0.26 5.106 0.3564 105 75 125

### Qualifiers:

- |    |   |                                      |                                      |   |  |
|----|---|--------------------------------------|--------------------------------------|---|--|
| B  | Analyte detected in the associated Method Blank | E                                    | Value above quantitation range       | H | Holding times for preparation or analysis exceeded           |
| ND | Not Detected at the Reporting Limit             | R                                    | RPD outside accepted recovery limits | S | Spike/Surrogate outside of limits due to matrix interference |
| DO | Surrogate Diluted Out                           | Calculations are based on raw values |                                      |   |  |



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**ASSET Laboratories**
**ANALYTICAL RESULTS**
**Print Date:** 16-Apr-18

<b>CLIENT:</b>	CH2M HILL	<b>Client Sample ID:</b>	Phase Separator-571-Sludge
<b>Lab Order:</b>	N029489	<b>Collection Date:</b>	4/2/2018 9:15:00 AM
<b>Project:</b>	PG&E Topock, 680375.03.IM.OP.00	<b>Matrix:</b>	SOIL
<b>Lab ID:</b>	N029489-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**TOTAL MERCURY BY COLD VAPOR TECHNIQUE**
**EPA 7471A**

RunID: <b>NV00922-AA1_180403B</b>	QC Batch: <b>67433</b>	PrepDate	<b>4/3/2018</b>	Analyst: <b>CEI</b>
Mercury	ND	0.056	0.21	mg/Kg-dry 1 4/3/2018 12:41 PM

<b>Qualifiers:</b>	B	Analyte detected in the associated Method Blank	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
	DO	Surrogate Diluted Out		


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**CLIENT:** CH2M HILL  
**Work Order:** N029489  
**Project:** PG&E Topock, 680375.03.IM.OP.00

**ANALYTICAL QC SUMMARY REPORT****TestCode: 7471\_S\_PGE**

Sample ID <b>MB-67433</b>	SampType: <b>MBLK</b>	TestCode: <b>7471_S_PGE</b>	Units: <b>mg/Kg</b>	Prep Date: <b>4/3/2018</b>	RunNo: <b>123084</b>							
Client ID: <b>PBS</b>	Batch ID: <b>67433</b>	TestNo: <b>EPA 7471A</b>		Analysis Date: <b>4/3/2018</b>	SeqNo: <b>2976708</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	
Mercury	ND	0.10										

Sample ID <b>LCS-67433</b>	SampType: <b>LCS</b>	TestCode: <b>7471_S_PGE</b>	Units: <b>mg/Kg</b>	Prep Date: <b>4/3/2018</b>	RunNo: <b>123084</b>							
Client ID: <b>LCSS</b>	Batch ID: <b>67433</b>	TestNo: <b>EPA 7471A</b>		Analysis Date: <b>4/3/2018</b>	SeqNo: <b>2976709</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	
Mercury	0.395	0.10	0.4167	0	94.7	75	125					

Sample ID <b>N029485-015B-MS</b>	SampType: <b>MS</b>	TestCode: <b>7471_S_PGE</b>	Units: <b>mg/Kg-dry</b>	Prep Date: <b>4/3/2018</b>	RunNo: <b>123084</b>							
Client ID: <b>ZZZZZZ</b>	Batch ID: <b>67433</b>	TestNo: <b>EPA 7471A</b>		Analysis Date: <b>4/3/2018</b>	SeqNo: <b>2976710</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	
Mercury	0.718	0.15	0.6200	0.2705	72.1	75	125				S	

Sample ID <b>N029485-015B-MSD</b>	SampType: <b>MSD</b>	TestCode: <b>7471_S_PGE</b>	Units: <b>mg/Kg-dry</b>	Prep Date: <b>4/3/2018</b>	RunNo: <b>123084</b>							
Client ID: <b>ZZZZZZ</b>	Batch ID: <b>67433</b>	TestNo: <b>EPA 7471A</b>		Analysis Date: <b>4/3/2018</b>	SeqNo: <b>2976711</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	
Mercury	0.770	0.15	0.6200	0.2705	80.5	75	125	0.7178	6.97	20		

**Qualifiers:**

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out	Calculations are based on raw values			



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ANALYTICAL SERVICES PROVIDED BY PROFESSIONAL TECHNOLOGISTS

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# ASSET Laboratories

# ANALYTICAL RESULTS

Print Date: 16-Apr-18

CLIENT:	CH2M HILL	Client Sample ID:	Phase Separator-571-Sludge
Lab Order:	N029489	Collection Date:	4/2/2018 9:15:00 AM
Project:	PG&E Topock, 680375.03.IM.OP.00	Matrix:	SOIL
Lab ID:	N029489-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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## PERCENT MOISTURE

D2216

RunID: NV00922-WC_180403A	QC Batch: R123071	PrepDate	Analyst: LR
Percent Moisture	52.04 0.1000 0.1000	wt%	1 4/3/2018 09:00 AM

Qualifiers:	B	Analyte detected in the associated Method Blank	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
	DO	Surrogate Diluted Out		



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**CLIENT:** CH2M HILL  
**Work Order:** N029489  
**Project:** PG&E Topock, 680375.03.IM.OP.00

**ANALYTICAL QC SUMMARY REPORT****TestCode: PMOIST**

Sample ID	MB-R123071	SampType:	MBLK	TestCode:	PMOIST	Units:	wt%	Prep Date:		RunNo:	123071	
Client ID:	PBS	Batch ID:	R123071	TestNo:	D2216			Analysis Date:	4/3/2018	SeqNo:	2976402	
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Percent Moisture		ND	0.1000									

Sample ID	N029484-001ADUP	SampType:	DUP	TestCode:	PMOIST	Units:	wt%	Prep Date:		RunNo:	123071	
Client ID:	ZZZZZZ	Batch ID:	R123071	TestNo:	D2216			Analysis Date:	4/3/2018	SeqNo:	2976404	
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Percent Moisture		6.138	0.1000						5.747	6.57	30	

Sample ID	N029485-020BDUP	SampType:	DUP	TestCode:	PMOIST	Units:	wt%	Prep Date:		RunNo:	123071	
Client ID:	ZZZZZZ	Batch ID:	R123071	TestNo:	D2216			Analysis Date:	4/3/2018	SeqNo:	2976421	
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Percent Moisture		38.906	0.1000						39.68	1.96	30	

**Qualifiers:**

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out	Calculations are based on raw values			


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Project Name <b>PG&amp;E Topock</b> Location <b>PG&amp;E Topock</b> Project Number <b>680375.03.IM.OP.00</b> Project Manager <b>Scott O'Donnell</b> Sample Manager <b>Shawn Duffy</b>  Task Order Project <b>IM3PLANT-ARAR-WDR-571-SLUDGE</b> Turnaround Time <b>10</b> Days Shipping Date: COC Number: <b>571-s</b>				Container: Glass Jar(8 oz) Glass Jar(8 oz) 4 oz jar Preservatives: none none 4°C Filtered: NA NA NA Holding Time: NA NA 180					Number of Containers	COMMENTS
				Anions (E300, Soil) FI Metals (6010B, Soil) Title 22, Mercury, Mn Metals (7199)						
DATE	TIME	Matrix								
Phase Separator-571-Sludge	4-2-18	9:15	Soil	X	X	X	N029489-01	5		
TOTAL NUMBER OF CONTAINERS							5			

Approved by <i>Scott O'Donnell</i> Sampled by <i>LB GG</i> Relinquished by <i>Shawn Duffy</i> Received by <i>Shawn Duffy</i> Relinquished by <i>Shawn Duffy</i> Received by <i>Shawn Duffy</i>		Signatures Date/Time 4-2-18 4-2-18 9:15 4-2-18 1300 4/2/18 1300 4/2/18 1300 4/2/18 1300	Shipping Details Method of Shipment: <b>FedEx</b> On Ice: <input checked="" type="checkbox"/> yes / no <i>2</i> Airbill No: Lab Name: <b>ASSET Laboratories</b> Lab Phone: <b>(702) 307-2659</b>	ATTN:  <b>Sample Custody</b> and <b>Marlon Cartin</b>	Special Instructions:  Report Copy to <b>Doug Scott</b> <b>(970) 731-0636</b>
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## ASSET Laboratories

Please review the checklist below. Any NO signifies non-compliance. Any non-compliance will be noted and must be understood as having an impact on the quality of the data. All tests will be performed as requested regardless of any compliance issues.

If you have any questions or further instruction, please contact our Project Coordinator at (702) 307-2659.


Cooler Received/Opened On: 4/2/2018 Workorder: N029489  
 Rep sample Temp (Deg C): 2.9 IR Gun ID: 2  
 Temp Blank: ☒ Yes ☐ No  
 Carrier name: ASSET  
 Last 4 digits of Tracking No.: NA Packing Material Used: None  
 Cooling process: ☒ Ice ☐ Ice Pack ☐ Dry Ice ☐ Other ☐ None

### Sample Receipt Checklist


- |   |   |                             |   |
|---|---|-----------------------------|---|
| 1. Shipping container/cooler in good condition?   | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> | Not Present <input type="checkbox"/>            |
| 2. Custody seals intact, signed, dated on shipping container/cooler?                    | Yes <input type="checkbox"/>            | No <input type="checkbox"/> | Not Present <input checked="" type="checkbox"/> |
| 3. Custody seals intact on sample bottles?  | Yes <input type="checkbox"/>            | No <input type="checkbox"/> | Not Present <input checked="" type="checkbox"/> |
| 4. Chain of custody present?  | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> |   |
| 5. Sampler's name present in COC?   | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> |   |
| 6. Chain of custody signed when relinquished and received?                              | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> |   |
| 7. Chain of custody agrees with sample labels?  | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> |   |
| 8. Samples in proper container/bottle?  | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> |   |
| 9. Sample containers intact?  | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> |   |
| 10. Sufficient sample volume for indicated test?  | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> |   |
| 11. All samples received within holding time?   | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> |   |
| 12. Temperature of rep sample or Temp Blank within acceptable limit?                    | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> | NA <input type="checkbox"/>                     |
| 13. Water - VOA vials have zero headspace?  | Yes <input type="checkbox"/>            | No <input type="checkbox"/> | NA <input checked="" type="checkbox"/>          |
| 14. Water - pH acceptable upon receipt?<br>Example: pH > 12 for (CN,S); pH<2 for Metals | Yes <input type="checkbox"/>            | No <input type="checkbox"/> | NA <input checked="" type="checkbox"/>          |
| 15. Did the bottle labels indicate correct preservatives used?                          | Yes <input type="checkbox"/>            | No <input type="checkbox"/> | NA <input checked="" type="checkbox"/>          |
| 16. Were there Non-Conformance issues at login?   | Yes <input type="checkbox"/>            | No <input type="checkbox"/> | NA <input checked="" type="checkbox"/>          |
| Was Client notified?  | Yes <input type="checkbox"/>            | No <input type="checkbox"/> | NA <input checked="" type="checkbox"/>          |

Comments:

Checklist Completed By: YR

 4/12/2018

Reviewed By:

 4/16/2018

## List of Analysts

### ASSET Laboratories Work Order: N029489

NAME	TEST METHOD
Claire Ignacio	EPA 6010B, EPA 7471A
Ria Abes	EPA 300.0, EPA 7199
Lilia Ramit	ASTM D2216



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Environmental Testing Laboratory Since 1949



Date of Report: 04/18/2018

Marlon Cartin

ASSET Laboratories

3151-3153 W. Post Rd  
Las Vegas, NV 89118

Client Project: N029640

BCL Project: Level IV

BCL Work Order: 1811781

Invoice ID: B300806

Enclosed are the results of analyses for samples received by the laboratory on 4/10/2018. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Contact Person: Vanessa Sandoval  
Client Service Rep

Stuart Buttram  
Technical Director

Certifications: CA ELAP #1186; NV #CA00014; OR ELAP #4032-001; AK UST101

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Chain of Custody and Cooler Receipt Form for 1811781 Page 1 of 2

Page 1 of 1

**CHAIN-OF-CUSTODY RECORD**

18-11781

**RUSH!**

09-Apr-18

QC Level: Level IV

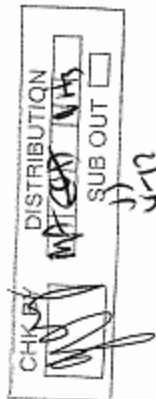
Field Sampler: SIGNED

Subcontractor: BC Labs  
4100 Atlas Court  
Bakersfield, CA 93308

TEL: (661) 327-4911  
FAX: (661) 327-1918  
Acct #:

ASSET Laboratories  
3151-3153 W Post Rd., Las Vegas, NV 89118  
www.aff-labs.com  
TEL: 7023072659  
FAX: 7023072691

Sample ID	Matrix	Date Collected	Bottle Type	Requested Tests
N029840-001A / SC-7008-WDR-572	Water	4/8/2018 6:20:00 PM	32OZP	SM4500-NH3D 1



General Comments: Please email sample receipt acknowledgement to the P.M.  
Please use PO# N29640A. Please email invoices and Account Receivable Statements to elvira@assetlaboratories.com. For questions, call Marion at (702)-307-2659. Please e-mail results to reports.lv@assetlaboratories.com by Normal FAX.  
Please analyze for Ammonia by SM4500NH3D. EDD Requirement LabSpec7 edata.

GSO #: 540127800

Relinquished by:	Date/Time	Received by:	Date/Time
	4/9/2018 17:00		4-10-18 09:10
Relinquished by:		Received by:	



**Laboratories, Inc.**

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Chain of Custody and Cooler Receipt Form for 1811781 Page 2 of 2

BC LABORATORIES INC.		COOLER RECEIPT FORM		Page 1 Of 1							
Submission #: 18-11781											
<b>SHIPPING INFORMATION</b>		<b>SHIPPING CONTAINER</b>		<b>FREE LIQUID</b>							
Fed Ex <input type="checkbox"/>	UPS <input type="checkbox"/>	Ontrac <input type="checkbox"/>	Hand Delivery <input type="checkbox"/>	Ice Chest <input checked="" type="checkbox"/>	None <input type="checkbox"/> Box <input type="checkbox"/>						
BC Lab Field Service <input type="checkbox"/>		Other (Specify) <u>650</u>		Other <input type="checkbox"/> (Specify) _____							
Refrigerant: Ice <input checked="" type="checkbox"/> Blue Ice <input type="checkbox"/> None <input type="checkbox"/> Other <input type="checkbox"/> Comments: _____											
Custody Seals <input checked="" type="checkbox"/> Containers <input checked="" type="checkbox"/> None <input type="checkbox"/> Comments: _____											
All samples received? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> All samples containers intact? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Description(s) match COC? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>											
COC Received <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		Emissivity: <u>97</u> Container: <u>650</u> Thermometer ID: <u>274</u>		Date/Time: <u>4-10-18</u>							
		Temperature: (A) <u>0.0</u> °C / (C) <u>0.8</u> °C		Analyst Init: <u>1509:10</u>							
<b>SAMPLE CONTAINERS</b>		<b>SAMPLE NUMBERS</b>									
		1	2	3	4	5	6	7	8	9	10
QT PE UNPRES											
4oz / Box / 16oz PE UNPRES											
2oz Cr <sup>14</sup>											
QT INORGANIC CHEMICAL METALS											
INORGANIC CHEMICAL METALS 4oz / Box / 16oz											
PT CYANIDE											
PT NITROGEN FORMS <u>07</u>		<u>1</u>									
PT TOTAL SULFIDE											
2oz. NITRATE / NITRITE											
PT TOTAL ORGANIC CARBON											
PT CHEMICAL OXYGEN DEMAND											
PIA PHENOLICS											
40ml VOA VIAL TRAVEL BLANK											
40ml VOA VIAL											
QT EPA 1664											
PT ODOR											
RADIOLOGICAL											
BACTERIOLOGICAL											
40 ml VOA VIAL- 504											
QT EPA 503/508/5080											
QT EPA 515.1/5150											
QT EPA 525											
QT EPA 525 TRAVEL BLANK											
40ml EPA 547											
40ml EPA 531.1											
5oz EPA 543											
QT EPA 549											
QT EPA 5915M											
QT EPA 8270											
8oz / 16oz / 32oz AMBER											
8oz / 16oz / 32oz JAR											
SOIL SLURRY											
PCB VIAL											
PLASTIC BAG											
TEDLAR BAG											
FERROUS IRON											
ENCORE											
SMART KIT											
SUMMA CANISTER											

Comments:

Sample Numbering Completed By: JK

Date/Time: 4-12-18

Rev 21 05/23/2016

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ASSET Laboratories  
3151-3153 W. Post Rd  
Las Vegas, NV 89118

**Reported:** 04/18/2018 15:21  
**Project:** Level IV  
**Project Number:** N029640  
**Project Manager:** Marlon Cartin

## Laboratory / Client Sample Cross Reference

Laboratory	Client Sample Information			
1811781-01	<b>COC Number:</b>	---	<b>Receive Date:</b>	04/10/2018 09:10
	<b>Project Number:</b>	---	<b>Sampling Date:</b>	04/06/2018 18:20
	<b>Sampling Location:</b>	---	<b>Sample Depth:</b>	---
	<b>Sampling Point:</b>	N029640-001A / SC-700B-WDR-572	<b>Lab Matrix:</b>	Water
	<b>Sampled By:</b>	---	<b>Sample Type:</b>	Water

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Las Vegas, NV 89118

**Reported:** 04/18/2018 15:21  
**Project:** Level IV  
**Project Number:** N029640  
**Project Manager:** Marlon Cartin

## Water Analysis (General Chemistry)

<b>BCL Sample ID:</b>	1811781-01	<b>Client Sample Name:</b>	N029640-001A / SC-700B-WDR-572, 4/6/2018 6:20:00PM					
<b>Constituent</b>	<b>Result</b>	<b>Units</b>	<b>PQL</b>	<b>MDL</b>	<b>Method</b>	<b>MB Bias</b>	<b>Lab Quals</b>	<b>Run #</b>
Ammonia as N (Distilled)	ND	mg/L	0.20		SM-4500-NH3G	ND		1

<b>Run #</b>	<b>Method</b>	<b>Prep Date</b>	<b>Run Date/Time</b>	<b>Analyst</b>	<b>Instrument</b>	<b>Dilution</b>	<b>QC Batch ID</b>
1	SM-4500-NH3G	04/17/18 08:57	04/17/18 16:47	JMH	SC-1	1	B010982

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Las Vegas, NV 89118

**Reported:** 04/18/2018 15:21  
**Project:** Level IV  
**Project Number:** N029640  
**Project Manager:** Marlon Cartin

## Water Analysis (General Chemistry)

### Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
<b>QC Batch ID: B010982</b>						
Ammonia as N (Distilled)	B010982-BLK1	ND	mg/L	0.20		

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Las Vegas, NV 89118

**Reported:** 04/18/2018 15:21  
**Project:** Level IV  
**Project Number:** N029640  
**Project Manager:** Marlon Cartin

## Water Analysis (General Chemistry)

### Quality Control Report - Laboratory Control Sample

								Control Limits		
Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Percent Recovery	RPD	Lab
Quals										
QC Batch ID: B010982										
	Ammonia as N (Distilled)	B010982-BS1	LCS	1.0239	1.0000	mg/L	102		85 - 115	

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ASSET Laboratories  
3151-3153 W. Post Rd  
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**Reported:** 04/18/2018 15:21  
**Project:** Level IV  
**Project Number:** N029640  
**Project Manager:** Marlon Cartin

## Water Analysis (General Chemistry)

### Quality Control Report - Precision & Accuracy

									Control Limits		
Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	RPD	Percent Recovery	Lab Quals
QC Batch ID: B010982		Used client sample: N									
Ammonia as N (Distilled)	DUP	1811492-01	0.10370	ND		mg/L			20		
	MS	1811492-01	0.10370	1.0760	1.0000	mg/L		97.2		80 - 120	
	MSD	1811492-01	0.10370	1.2123	1.0000	mg/L	11.9	111	20	80 - 120	

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April 20, 2018

Doug Scott  
CH2M HILL  
155 Grand Avenue, Suite 1000  
Oakland, CA 94612  
TEL: (970) 731-0636  
FAX: (510) 622-9129

Workorder No.: N029640

RE: PG&E Topock, 680375.02.IM.OP.00

Attention: Doug Scott

Enclosed are the results for sample(s) received on April 06, 2018 by ASSET Laboratories . The sample(s) are tested for the parameters as indicated in the enclosed chain of custody in accordance with the applicable laboratory certifications.

Thank you for the opportunity to service the needs of your company.

Please feel free to call me at (702) 307-2659 if I can be of further assistance to your company.

Sincerely,



Quennie Manimtim  
Laboratory Director

The cover letter is an integral part of this analytical report. This Laboratory Report cannot be reproduced in part or in its entirety without written permission from the client and Advanced Technology Laboratories - Las Vegas.



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**CLIENT:** CH2M HILL  
**Project:** PG&E Topock, 680375.02.IM.OP.00  
**Lab Order:** N029640

**CASE NARRATIVE****SAMPLE RECEIVING/GENERAL COMMENTS:**

All sample containers were received intact with proper chain of custody documentation.

Information on sample receipt conditions including discrepancies can be found in attached Sample Receipt Checklist Form.

Cooler temperature and sample preservation were verified upon receipt of samples if applicable.

Samples were analyzed within method holding time.

**Subcontracted Analyses:**

Ammonia was subcontracted to BC Labs- Bakersfield,CA.

**Analytical Comments for EPA 200.8:**

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) are outside recovery criteria for Copper in QC samples N029640-001E-MS and N029640-001E-MSD possibly due to matrix interference. The associated Laboratory Control Sample (LCS) recovery was acceptable.

**Analytical Comments for EPA 300.0:**

Sample required dilution for Fluoride due to precipitation upon the addition of eluent.



**ASSET Laboratories**

Date: 20-Apr-18

**CLIENT:** CH2M HILL  
**Project:** PG&E Topock, 680375.02.IM.OP.00  
**Lab Order:** N029640  
**Contract No:** IM3PLANT-AR

**Work Order Sample Summary**

Lab Sample ID	Client Sample ID	Matrix	Collection Date	Date Received	Date Reported
N029640-001A	SC-700B-WDR-572	Water	4/6/2018 6:20:00 PM	4/6/2018	4/20/2018
N029640-001B	SC-700B-WDR-572	Water	4/6/2018 6:20:00 PM	4/6/2018	4/20/2018
N029640-001C	SC-700B-WDR-572	Water	4/6/2018 6:20:00 PM	4/6/2018	4/20/2018
N029640-001D	SC-700B-WDR-572	Water	4/6/2018 6:20:00 PM	4/6/2018	4/20/2018
N029640-001E	SC-700B-WDR-572	Water	4/6/2018 6:20:00 PM	4/6/2018	4/20/2018



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**ASSET Laboratories**
**ANALYTICAL RESULTS**
**Print Date:** 20-Apr-18

**CLIENT:** CH2M HILL  
**Lab Order:** N029640  
**Project:** PG&E Topock, 680375.02.IM.OP.00  
**Lab ID:** N029640-001

**Client Sample ID:** SC-700B-WDR-572  
**Collection Date:** 4/6/2018 6:20:00 PM  
**Matrix:** WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
----------	--------	-----	-----	------	-------	----	---------------

**SPECIFIC CONDUCTANCE**
**EPA 120.1**

RunID: <b>NV00922-WC_180407A</b>	QC Batch: <b>R123200</b>			PrepDate		Analyst: <b>QBM</b>
Specific Conductance	7800	0.10	0.10	umhos/cm	1	4/7/2018 10:15 AM

**Qualifiers:** B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 S Spike/Surrogate outside of limits due to matrix interference  
 DO Surrogate Diluted Out  
 E Value above quantitation range  
 ND Not Detected at the Reporting Limit  
 Results are wet unless otherwise specified



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**CLIENT:** CH2M HILL  
**Work Order:** N029640  
**Project:** PG&E Topock, 680375.02.IM.OP.00

**ANALYTICAL QC SUMMARY REPORT****TestCode: 120.1\_WPGE**

Sample ID	N029640-001BDUP	SampType:	DUP	TestCode:	120.1_WPGE	Units:	umhos/cm	Prep Date:		RunNo:	123200		
Client ID:	ZZZZZZ	Batch ID:	R123200	TestNo:	EPA 120.1			Analysis Date:	4/7/2018	SeqNo:	2983262		
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Specific Conductance		7780.000		0.10						7760	0.257	2	

**Qualifiers:**

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

**ASSET LABORATORIES**

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**ASSET Laboratories**
**ANALYTICAL RESULTS**
**Print Date:** 20-Apr-18

**CLIENT:** CH2M HILL  
**Lab Order:** N029640  
**Project:** PG&E Topock, 680375.02.IM.OP.00  
**Lab ID:** N029640-001

**Client Sample ID:** SC-700B-WDR-572  
**Collection Date:** 4/6/2018 6:20:00 PM  
**Matrix:** WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
----------	--------	-----	-----	------	-------	----	---------------

**TOTAL FILTERABLE RESIDUE**
**SM2540C**

RunID: <b>NV00922-WC_180410D</b>	QC Batch: <b>67580</b>				PrepDate <b>4/10/2018</b>		Analyst: <b>LR</b>
Total Dissolved Solids (Residue, Filterable)	4400	50	50		mg/L	1	4/10/2018 01:14 PM

**Qualifiers:** B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 S Spike/Surrogate outside of limits due to matrix interference  
 DO Surrogate Diluted Out  
 E Value above quantitation range  
 ND Not Detected at the Reporting Limit  
 Results are wet unless otherwise specified



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**CLIENT:** CH2M HILL  
**Work Order:** N029640  
**Project:** PG&E Topock, 680375.02.IM.OP.00

**ANALYTICAL QC SUMMARY REPORT****TestCode: 160.1\_2540C\_W**

Sample ID	LCS-67580	SampType:	LCS	TestCode:	160.1_2540C	Units:	mg/L	Prep Date:	4/10/2018	RunNo:	123280		
Client ID:	LCSW	Batch ID:	67580	TestNo:	SM2540C			Analysis Date:	4/10/2018	SeqNo:	2987802		
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera		979.000		10	1000	0	97.9	80	120				

Sample ID	MB-67580	SampType:	MBLK	TestCode:	160.1_2540C	Units:	mg/L	Prep Date:	4/10/2018	RunNo:	123280		
Client ID:	PBW	Batch ID:	67580	TestNo:	SM2540C			Analysis Date:	4/10/2018	SeqNo:	2987803		
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera		ND		10									

Sample ID	N029640-001BDUP	SampType:	DUP	TestCode:	160.1_2540C	Units:	mg/L	Prep Date:	4/10/2018	RunNo:	123280		
Client ID:	ZZZZZZ	Batch ID:	67580	TestNo:	SM2540C			Analysis Date:	4/10/2018	SeqNo:	2987811		
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera		4470.000		50						4400	1.58	5	

**Qualifiers:**

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out	Calculations are based on raw values			



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**ASSET Laboratories**
**ANALYTICAL RESULTS**
**Print Date:** 20-Apr-18

**CLIENT:** CH2M HILL  
**Lab Order:** N029640  
**Project:** PG&E Topock, 680375.02.IM.OP.00  
**Lab ID:** N029640-001

**Client Sample ID:** SC-700B-WDR-572  
**Collection Date:** 4/6/2018 6:20:00 PM  
**Matrix:** WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**TOTAL METALS BY ICP**
**EPA 200.7**

RunID: <b>NV00922-ICP2_180412E</b>	QC Batch: <b>67564</b>			PrepDate	<b>4/11/2018</b>	Analyst: <b>CEI</b>
Aluminum	ND	40	50	µg/L	1	4/13/2018 12:46 AM
Boron	1000	74	100	µg/L	1	4/13/2018 12:46 AM
Iron	820	18	20	µg/L	1	4/13/2018 12:46 AM

**Qualifiers:** B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 S Spike/Surrogate outside of limits due to matrix interference  
 DO Surrogate Diluted Out  
 E Value above quantitation range  
 ND Not Detected at the Reporting Limit  
 Results are wet unless otherwise specified



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"Serving Clients with Passion and Professionalism"

**CLIENT:** CH2M HILL  
**Work Order:** N029640  
**Project:** PG&E Topock, 680375.02.IM.OP.00

**ANALYTICAL QC SUMMARY REPORT****TestCode: 200.7\_WPGEPBP**

Sample ID <b>MB-67564</b>	SampType: <b>MBLK</b>	TestCode: <b>200.7_WPGE</b>	Units: <b>µg/L</b>	Prep Date: <b>4/11/2018</b>	RunNo: <b>123348</b>
Client ID: <b>PBW</b>	Batch ID: <b>67564</b>	TestNo: <b>EPA 200.7</b>		Analysis Date: <b>4/12/2018</b>	SeqNo: <b>2991695</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Aluminum	ND	50			
Boron	ND	100			
Iron	ND	20			

Sample ID <b>LCS1-67564</b>	SampType: <b>LCS</b>	TestCode: <b>200.7_WPGE</b>	Units: <b>µg/L</b>	Prep Date: <b>4/11/2018</b>	RunNo: <b>123348</b>
Client ID: <b>LCSW</b>	Batch ID: <b>67564</b>	TestNo: <b>EPA 200.7</b>		Analysis Date: <b>4/12/2018</b>	SeqNo: <b>2991696</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Aluminum	9719.789	50	10000	0	97.2 85 115
Boron	4733.065	100	5000	0	94.7 85 115
Iron	104.009	20	100.0	0	104 85 115

Sample ID <b>N029506-001D-MS1</b>	SampType: <b>MS</b>	TestCode: <b>200.7_WPGE</b>	Units: <b>µg/L</b>	Prep Date: <b>4/11/2018</b>	RunNo: <b>123348</b>
Client ID: <b>ZZZZZZ</b>	Batch ID: <b>67564</b>	TestNo: <b>EPA 200.7</b>		Analysis Date: <b>4/12/2018</b>	SeqNo: <b>2991702</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Aluminum	9994.355	50	10000	0	99.9 75 125
Boron	5265.943	100	5000	371.0	97.9 75 125
Iron	141.499	20	100.0	35.53	106 75 125

Sample ID <b>N029506-001D-MSD</b>	SampType: <b>MSD</b>	TestCode: <b>200.7_WPGE</b>	Units: <b>µg/L</b>	Prep Date: <b>4/11/2018</b>	RunNo: <b>123348</b>
Client ID: <b>ZZZZZZ</b>	Batch ID: <b>67564</b>	TestNo: <b>EPA 200.7</b>		Analysis Date: <b>4/12/2018</b>	SeqNo: <b>2991703</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Aluminum	10047.303	50	10000	0	100 75 125 9994 0.528 20
Boron	5268.033	100	5000	371.0	97.9 75 125 5266 0.0397 20
Iron	142.886	20	100.0	35.53	107 75 125 141.5 0.975 20

**Qualifiers:**

B Analyte detected in the associated Method Blank  
 ND Not Detected at the Reporting Limit  
 DO Surrogate Diluted Out  
 E Value above quantitation range  
 R RPD outside accepted recovery limits  
 H Holding times for preparation or analysis exceeded  
 S Spike/Surrogate outside of limits due to matrix interference

Calculations are based on raw values

**ASSET LABORATORIES**

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**ASSET Laboratories**
**ANALYTICAL RESULTS**
**Print Date:** 20-Apr-18

**CLIENT:** CH2M HILL  
**Lab Order:** N029640  
**Project:** PG&E Topock, 680375.02.IM.OP.00  
**Lab ID:** N029640-001

**Client Sample ID:** SC-700B-WDR-572  
**Collection Date:** 4/6/2018 6:20:00 PM  
**Matrix:** WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**TOTAL METALS BY ICPMS**
**EPA 200.8**

RunID: NV00922-ICP7_180413B	QC Batch: 67642	PrepDate	4/13/2018	Analyst: CEI		
Antimony	ND	0.16	0.50	µg/L	1	4/13/2018 02:11 PM
Arsenic	0.13	0.081	0.10	µg/L	1	4/13/2018 02:11 PM
Barium	19	0.15	1.0	µg/L	1	4/13/2018 02:11 PM
Copper	ND	0.55	1.0	µg/L	1	4/13/2018 02:11 PM
Lead	ND	0.13	1.0	µg/L	1	4/13/2018 02:11 PM
Manganese	130	1.3	2.5	µg/L	5	4/13/2018 02:16 PM
Molybdenum	27	0.21	0.50	µg/L	1	4/13/2018 02:11 PM
Nickel	6.4	0.26	1.0	µg/L	1	4/15/2018 07:04 PM
Zinc	ND	2.3	10	µg/L	1	4/13/2018 02:11 PM

**Qualifiers:** B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 S Spike/Surrogate outside of limits due to matrix interference  
 DO Surrogate Diluted Out  
 E Value above quantitation range  
 ND Not Detected at the Reporting Limit  
 Results are wet unless otherwise specified



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**CLIENT:** CH2M HILL  
**Work Order:** N029640  
**Project:** PG&E Topock, 680375.02.IM.OP.00

**ANALYTICAL QC SUMMARY REPORT****TestCode: 200.8\_W**

Sample ID	MB-67642	SampType:	MBLK	TestCode:	200.8_W	Units:	µg/L	Prep Date:	4/13/2018	RunNo:	123377		
Client ID:	PBW	Batch ID:	67642	TestNo:	EPA 200.8			Analysis Date:	4/13/2018	SeqNo:	2993815		
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Antimony	ND	0.50									
Arsenic	ND	0.10									
Barium	ND	1.0									
Copper	ND	1.0									
Lead	ND	1.0									
Manganese	ND	0.50									
Molybdenum	ND	0.50									
Zinc	ND	10									

Sample ID	LCS-67642	SampType:	LCS	TestCode:	200.8_W	Units:	µg/L	Prep Date:	4/13/2018	RunNo:	123377		
Client ID:	LCSW	Batch ID:	67642	TestNo:	EPA 200.8			Analysis Date:	4/13/2018	SeqNo:	2993816		
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Antimony	10.423	0.50	10.00	0	104	85	115				
Arsenic	10.166	0.10	10.00	0	102	85	115				
Barium	10.381	1.0	10.00	0	104	85	115				
Copper	10.364	1.0	10.00	0	104	85	115				
Lead	10.675	1.0	10.00	0	107	85	115				
Manganese	102.656	0.50	100.0	0	103	85	115				
Molybdenum	10.001	0.50	10.00	0	100	85	115				
Zinc	102.624	10	100.0	0	103	85	115				

Sample ID	N029640-001E-MS	SampType:	MS	TestCode:	200.8_W	Units:	µg/L	Prep Date:	4/13/2018	RunNo:	123377		
Client ID:	ZZZZZZ	Batch ID:	67642	TestNo:	EPA 200.8			Analysis Date:	4/13/2018	SeqNo:	2993834		
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Antimony	10.829	0.50	10.00	0	108	75	125				
Arsenic	10.572	0.10	10.00	0.1346	104	75	125				

**Qualifiers:**

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		



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**CLIENT:** CH2M HILL  
**Work Order:** N029640  
**Project:** PG&E Topock, 680375.02.IM.OP.00

## ANALYTICAL QC SUMMARY REPORT

**TestCode:** 200.8\_W

Sample ID	<b>N029640-001E-MS</b>	SampType:	<b>MS</b>	TestCode:	<b>200.8_W</b>	Units:	<b>µg/L</b>	Prep Date:	<b>4/13/2018</b>	RunNo:	<b>123377</b>
Client ID:	<b>ZZZZZZ</b>	Batch ID:	<b>67642</b>	TestNo:	<b>EPA 200.8</b>			Analysis Date:	<b>4/13/2018</b>	SeqNo:	<b>2993834</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Barium	28.536	1.0	10.00	19.47	90.7	75	125				
Copper	7.057	1.0	10.00	0	70.6	75	125				S
Lead	10.469	1.0	10.00	0	105	75	125				
Molybdenum	36.676	0.50	10.00	26.69	99.9	75	125				
Zinc	105.456	10	100.0	0	105	75	125				

Sample ID	<b>N029640-001E-MS</b>	SampType:	<b>MS</b>	TestCode:	<b>200.8_W</b>	Units:	<b>µg/L</b>	Prep Date:	<b>4/13/2018</b>	RunNo:	<b>123377</b>
Client ID:	<b>ZZZZZZ</b>	Batch ID:	<b>67642</b>	TestNo:	<b>EPA 200.8</b>			Analysis Date:	<b>4/13/2018</b>	SeqNo:	<b>2993835</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	212.682	2.5	100.0	129.2	83.5	75	125				

Sample ID	<b>N029640-001E-MSD</b>	SampType:	<b>MSD</b>	TestCode:	<b>200.8_W</b>	Units:	<b>µg/L</b>	Prep Date:	<b>4/13/2018</b>	RunNo:	<b>123377</b>
Client ID:	<b>ZZZZZZ</b>	Batch ID:	<b>67642</b>	TestNo:	<b>EPA 200.8</b>			Analysis Date:	<b>4/13/2018</b>	SeqNo:	<b>2993836</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	10.757	0.50	10.00	0	108	75	125	10.83	0.670	20	
Arsenic	10.659	0.10	10.00	0.1346	105	75	125	10.57	0.813	20	
Barium	28.722	1.0	10.00	19.47	92.5	75	125	28.54	0.647	20	
Copper	7.133	1.0	10.00	0	71.3	75	125	7.057	1.06	20	S
Lead	10.440	1.0	10.00	0	104	75	125	10.47	0.269	20	
Molybdenum	37.053	0.50	10.00	26.69	104	75	125	36.68	1.02	20	
Zinc	106.052	10	100.0	0	106	75	125	105.5	0.564	20	

Sample ID	<b>N029640-001E-MSD</b>	SampType:	<b>MSD</b>	TestCode:	<b>200.8_W</b>	Units:	<b>µg/L</b>	Prep Date:	<b>4/13/2018</b>	RunNo:	<b>123377</b>
Client ID:	<b>ZZZZZZ</b>	Batch ID:	<b>67642</b>	TestNo:	<b>EPA 200.8</b>			Analysis Date:	<b>4/13/2018</b>	SeqNo:	<b>2993839</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	218.144	2.5	100.0	129.2	89.0	75	125	212.7	2.54	20	

### Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out	Calculations are based on raw values			



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**CLIENT:** CH2M HILL  
**Work Order:** N029640  
**Project:** PG&E Topock, 680375.02.IM.OP.00

## ANALYTICAL QC SUMMARY REPORT

**TestCode:** 200.8\_W

Sample ID	MB-67642	SampType:	MBLK	TestCode:	200.8_W	Units:	µg/L	Prep Date:	4/13/2018	RunNo:	123379		
Client ID:	PBW	Batch ID:	67642	TestNo:	EPA 200.8			Analysis Date:	4/15/2018	SeqNo:	2994231		
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Nickel ND 1.0

Sample ID	LCS-67642	SampType:	LCS	TestCode:	200.8_W	Units:	µg/L	Prep Date:	4/13/2018	RunNo:	123379		
Client ID:	LCSW	Batch ID:	67642	TestNo:	EPA 200.8			Analysis Date:	4/15/2018	SeqNo:	2994232		
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Nickel 9.983 1.0 10.00 0 99.8 85 115

Sample ID	N029640-001E-MS	SampType:	MS	TestCode:	200.8_W	Units:	µg/L	Prep Date:	4/13/2018	RunNo:	123379		
Client ID:	ZZZZZZ	Batch ID:	67642	TestNo:	EPA 200.8			Analysis Date:	4/15/2018	SeqNo:	2994237		
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Nickel 16.225 1.0 10.00 6.364 98.6 75 125

Sample ID	N029640-001E-MSD	SampType:	MSD	TestCode:	200.8_W	Units:	µg/L	Prep Date:	4/13/2018	RunNo:	123379		
Client ID:	ZZZZZZ	Batch ID:	67642	TestNo:	EPA 200.8			Analysis Date:	4/15/2018	SeqNo:	2994238		
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Nickel 15.865 1.0 10.00 6.364 95.0 75 125 16.22 2.24 20

### Qualifiers:

- |    |   |                                      |                                      |   |  |
|----|---|--------------------------------------|--------------------------------------|---|--|
| B  | Analyte detected in the associated Method Blank | E                                    | Value above quantitation range       | H | Holding times for preparation or analysis exceeded           |
| ND | Not Detected at the Reporting Limit             | R                                    | RPD outside accepted recovery limits | S | Spike/Surrogate outside of limits due to matrix interference |
| DO | Surrogate Diluted Out                           | Calculations are based on raw values |                                      |   |  |



**ASSET LABORATORIES**  
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**ASSET Laboratories**
**ANALYTICAL RESULTS**
**Print Date:** 20-Apr-18

**CLIENT:** CH2M HILL  
**Lab Order:** N029640  
**Project:** PG&E Topock, 680375.02.IM.OP.00  
**Lab ID:** N029640-001

**Client Sample ID:** SC-700B-WDR-572  
**Collection Date:** 4/6/2018 6:20:00 PM  
**Matrix:** WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**HEXAVALENT CHROMIUM BY IC**
**EPA 218.6**

RunID: <b>NV00922-IC7_180409B</b>	QC Batch: <b>R123236</b>				PrepDate		Analyst: <b>RAB</b>
Hexavalent Chromium	0.79	0.033	0.20		µg/L	1	4/9/2018 03:58 PM

**TOTAL METALS BY ICPMS**
**EPA 200.8**

RunID: <b>NV00922-ICP7_180413A</b>	QC Batch: <b>67642</b>				PrepDate	<b>4/13/2018</b>	Analyst: <b>CEI</b>
Chromium	16	0.13	1.0		µg/L	1	4/13/2018 02:11 PM

**Qualifiers:** B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 S Spike/Surrogate outside of limits due to matrix interference  
 DO Surrogate Diluted Out  
 E Value above quantitation range  
 ND Not Detected at the Reporting Limit  
 Results are wet unless otherwise specified



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**CLIENT:** CH2M HILL  
**Work Order:** N029640  
**Project:** PG&E Topock, 680375.02.IM.OP.00

**ANALYTICAL QC SUMMARY REPORT****TestCode: 200.8\_W\_CRPGE**

Sample ID <b>MB-67642</b>	SampType: <b>MBLK</b>	TestCode: <b>200.8_W_CR</b>	Units: <b>µg/L</b>	Prep Date: <b>4/13/2018</b>	RunNo: <b>123376</b>
Client ID: <b>PBW</b>	Batch ID: <b>67642</b>	TestNo: <b>EPA 200.8</b>		Analysis Date: <b>4/13/2018</b>	SeqNo: <b>2993644</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual
Chromium	ND	1.0			

Sample ID <b>LCS-67642</b>	SampType: <b>LCS</b>	TestCode: <b>200.8_W_CR</b>	Units: <b>µg/L</b>	Prep Date: <b>4/13/2018</b>	RunNo: <b>123376</b>
Client ID: <b>LCSW</b>	Batch ID: <b>67642</b>	TestNo: <b>EPA 200.8</b>		Analysis Date: <b>4/13/2018</b>	SeqNo: <b>2993645</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual
Chromium	10.364	1.0	10.00	0	104 85 115

Sample ID <b>N029640-001E-MS</b>	SampType: <b>MS</b>	TestCode: <b>200.8_W_CR</b>	Units: <b>µg/L</b>	Prep Date: <b>4/13/2018</b>	RunNo: <b>123376</b>
Client ID: <b>ZZZZZZ</b>	Batch ID: <b>67642</b>	TestNo: <b>EPA 200.8</b>		Analysis Date: <b>4/13/2018</b>	SeqNo: <b>2993663</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual
Chromium	24.701	1.0	10.00	16.35	83.5 75 125

Sample ID <b>N029640-001E-MSD</b>	SampType: <b>MSD</b>	TestCode: <b>200.8_W_CR</b>	Units: <b>µg/L</b>	Prep Date: <b>4/13/2018</b>	RunNo: <b>123376</b>
Client ID: <b>ZZZZZZ</b>	Batch ID: <b>67642</b>	TestNo: <b>EPA 200.8</b>		Analysis Date: <b>4/13/2018</b>	SeqNo: <b>2993665</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual
Chromium	25.004	1.0	10.00	16.35	86.5 75 125 24.70 1.22 20

**Qualifiers:**

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out	Calculations are based on raw values			


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 ORELAP/NELAP Cert 4046

"Serving Clients with Passion and Professionalism"

**CLIENT:** CH2M HILL  
**Work Order:** N029640  
**Project:** PG&E Topock, 680375.02.IM.OP.00

## ANALYTICAL QC SUMMARY REPORT

**TestCode:** 218.6\_WU\_PGE

Sample ID	LCS-R123236	SampType:	LCS	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	123236			
Client ID:	LCSW	Batch ID:	R123236	TestNo:	EPA 218.6			Analysis Date:	4/9/2018	SeqNo:	2985456			
Analyte		Result		PQL	SPK value	SPK Ref Val		%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Hexavalent Chromium	5.082	0.20	5.000	0	102	90	110
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Sample ID	MB-R123236	SampType:	MBLK	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	123236			
Client ID:	PBW	Batch ID:	R123236	TestNo:	EPA 218.6			Analysis Date:	4/9/2018	SeqNo:	2985457			
Analyte		Result		PQL	SPK value	SPK Ref Val		%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Hexavalent Chromium	ND	0.20
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Sample ID	N029634-003AMS	SampType:	MS	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	123236			
Client ID:	ZZZZZZ	Batch ID:	R123236	TestNo:	EPA 218.6			Analysis Date:	4/9/2018	SeqNo:	2985459			
Analyte		Result		PQL	SPK value	SPK Ref Val		%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Hexavalent Chromium	3.988	0.20	1.000	3.019	96.9	90	110
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Sample ID	N029634-003AMSD	SampType:	MSD	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	123236			
Client ID:	ZZZZZZ	Batch ID:	R123236	TestNo:	EPA 218.6			Analysis Date:	4/9/2018	SeqNo:	2985460			
Analyte		Result		PQL	SPK value	SPK Ref Val		%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Hexavalent Chromium	4.044	0.20	1.000	3.019	102	90	110	3.988	1.38	20
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Sample ID	N029640-001CMS	SampType:	MS	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	123236			
Client ID:	ZZZZZZ	Batch ID:	R123236	TestNo:	EPA 218.6			Analysis Date:	4/9/2018	SeqNo:	2985464			
Analyte		Result		PQL	SPK value	SPK Ref Val		%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Hexavalent Chromium	1.869	0.20	1.000	0.7861	108	90	110
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### Qualifiers:

- |    |   |                                      |                                      |   |  |
|----|---|--------------------------------------|--------------------------------------|---|--|
| B  | Analyte detected in the associated Method Blank | E                                    | Value above quantitation range       | H | Holding times for preparation or analysis exceeded           |
| ND | Not Detected at the Reporting Limit             | R                                    | RPD outside accepted recovery limits | S | Spike/Surrogate outside of limits due to matrix interference |
| DO | Surrogate Diluted Out                           | Calculations are based on raw values |                                      |   |  |



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"Serving Clients with Passion and Professionalism"

CLIENT: CH2M HILL  
Work Order: N029640  
Project: PG&E Topock, 680375.02.IM.OP.00

## ANALYTICAL QC SUMMARY REPORT

TestCode: 218.6\_WU\_PGE

Sample ID	N029634-001ADUP	SampType:	DUP	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	123236		
Client ID:	ZZZZZZ	Batch ID:	R123236	TestNo:	EPA 218.6			Analysis Date:	4/9/2018	SeqNo:	2985466		
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium		1.616		0.20						1.608	0.496	20	

### Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		



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# ASSET Laboratories

# ANALYTICAL RESULTS

Print Date: 20-Apr-18

**CLIENT:** CH2M HILL  
**Lab Order:** N029640  
**Project:** PG&E Topock, 680375.02.IM.OP.00  
**Lab ID:** N029640-001

**Client Sample ID:** SC-700B-WDR-572  
**Collection Date:** 4/6/2018 6:20:00 PM  
**Matrix:** WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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## TURBIDITY

### SM 2130B

RunID: <b>NV00922-WC_180407B</b>	QC Batch: <b>R123202</b>	PrepDate	Analyst: <b>QBM</b>
Turbidity	0.59 0.10 0.10	NTU	1 4/7/2018 10:00 AM

**Qualifiers:** B Analyte detected in the associated Method Blank  
H Holding times for preparation or analysis exceeded  
S Spike/Surrogate outside of limits due to matrix interference  
DO Surrogate Diluted Out  
E Value above quantitation range  
ND Not Detected at the Reporting Limit  
Results are wet unless otherwise specified



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**CLIENT:** CH2M HILL  
**Work Order:** N029640  
**Project:** PG&E Topock, 680375.02.IM.OP.00

**ANALYTICAL QC SUMMARY REPORT****TestCode: 2130\_W**

Sample ID	MB-R123202	SampType:	MBLK	TestCode:	2130_W	Units:	NTU	Prep Date:		RunNo:	123202		
Client ID:	PBW	Batch ID:	R123202	TestNo:	SM 2130B			Analysis Date:	4/7/2018	SeqNo:	2983325		
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Turbidity		ND		0.10									

Sample ID	N029640-001BDUP	SampType:	DUP	TestCode:	2130_W	Units:	NTU	Prep Date:		RunNo:	123202		
Client ID:	ZZZZZZ	Batch ID:	R123202	TestNo:	SM 2130B			Analysis Date:	4/7/2018	SeqNo:	2983327		
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Turbidity		0.600		0.10						0.5900	1.68	30	

**Qualifiers:**

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out	Calculations are based on raw values			


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**ASSET Laboratories**
**ANALYTICAL RESULTS**
**Print Date:** 20-Apr-18

**CLIENT:** CH2M HILL  
**Lab Order:** N029640  
**Project:** PG&E Topock, 680375.02.IM.OP.00  
**Lab ID:** N029640-001

**Client Sample ID:** SC-700B-WDR-572  
**Collection Date:** 4/6/2018 6:20:00 PM  
**Matrix:** WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**ANIONS BY ION CHROMATOGRAPHY**
**EPA 300.0**

RunID: NV00922-IC8_180409A	QC Batch: R123261				PrepDate		Analyst: RAB
Fluoride	2.6	0.032	0.50		mg/L	5	4/9/2018 05:06 PM

**ANIONS BY ION CHROMATOGRAPHY**
**EPA 300.0**

RunID: NV00922-IC8_180409A	QC Batch: R123261				PrepDate		Analyst: RAB
Sulfate	510	1.1	25		mg/L	50	4/10/2018 12:14 AM

<b>Qualifiers:</b>	B	Analyte detected in the associated Method Blank	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
	DO	Surrogate Diluted Out		



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**CLIENT:** CH2M HILL  
**Work Order:** N029640  
**Project:** PG&E Topock, 680375.02.IM.OP.00

**ANALYTICAL QC SUMMARY REPORT****TestCode: 300\_W\_FPG**

Sample ID <b>MB-R123261_F</b>	SampType: <b>MBLK</b>	TestCode: <b>300_W_FPG</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>123261</b>
Client ID: <b>PBW</b>	Batch ID: <b>R123261</b>	TestNo: <b>EPA 300.0</b>		Analysis Date: <b>4/9/2018</b>	SeqNo: <b>2987394</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Fluoride ND 0.10

Sample ID <b>LCS-R123261_F</b>	SampType: <b>LCS</b>	TestCode: <b>300_W_FPG</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>123261</b>
Client ID: <b>LCSW</b>	Batch ID: <b>R123261</b>	TestNo: <b>EPA 300.0</b>		Analysis Date: <b>4/9/2018</b>	SeqNo: <b>2987395</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Fluoride 1.269 0.10 1.250 0 102 90 110

Sample ID <b>N029510-007BMS</b>	SampType: <b>MS</b>	TestCode: <b>300_W_FPG</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>123261</b>
Client ID: <b>ZZZZZZ</b>	Batch ID: <b>R123261</b>	TestNo: <b>EPA 300.0</b>		Analysis Date: <b>4/9/2018</b>	SeqNo: <b>2987408</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Fluoride 8.074 0.50 6.250 2.515 88.9 80 120

Sample ID <b>N029510-007BMSD</b>	SampType: <b>MSD</b>	TestCode: <b>300_W_FPG</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>123261</b>
Client ID: <b>ZZZZZZ</b>	Batch ID: <b>R123261</b>	TestNo: <b>EPA 300.0</b>		Analysis Date: <b>4/9/2018</b>	SeqNo: <b>2987409</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Fluoride 8.153 0.50 6.250 2.515 90.2 80 120 8.074 0.974 20

Sample ID <b>N029510-011BDUP</b>	SampType: <b>DUP</b>	TestCode: <b>300_W_FPG</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>123261</b>
Client ID: <b>ZZZZZZ</b>	Batch ID: <b>R123261</b>	TestNo: <b>EPA 300.0</b>		Analysis Date: <b>4/9/2018</b>	SeqNo: <b>2987410</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Fluoride 2.490 0.50 2.727 9.09 20

**Qualifiers:**

B Analyte detected in the associated Method Blank E Value above quantitation range H Holding times for preparation or analysis exceeded  
 ND Not Detected at the Reporting Limit R RPD outside accepted recovery limits S Spike/Surrogate outside of limits due to matrix interference  
 DO Surrogate Diluted Out

Calculations are based on raw values



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**CLIENT:** CH2M HILL  
**Work Order:** N029640  
**Project:** PG&E Topock, 680375.02.IM.OP.00

## ANALYTICAL QC SUMMARY REPORT

**TestCode:** 300\_W\_SO4PGE

Sample ID	<b>MB-R123261_SO4</b>	SampType:	<b>MBLK</b>	TestCode:	<b>300_W_SO4P</b>	Units:	<b>mg/L</b>	Prep Date:		RunNo:	<b>123261</b>
Client ID:	<b>PBW</b>	Batch ID:	<b>R123261</b>	TestNo:	<b>EPA 300.0</b>			Analysis Date:	<b>4/9/2018</b>	SeqNo:	<b>2987458</b>
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD RPDLimit Qual

Sulfate ND 0.50

Sample ID	<b>LCS-R123261_SO4</b>	SampType:	<b>LCS</b>	TestCode:	<b>300_W_SO4P</b>	Units:	<b>mg/L</b>	Prep Date:		RunNo:	<b>123261</b>
Client ID:	<b>LCSW</b>	Batch ID:	<b>R123261</b>	TestNo:	<b>EPA 300.0</b>			Analysis Date:	<b>4/9/2018</b>	SeqNo:	<b>2987459</b>
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD RPDLimit Qual

Sulfate 3.987 0.50 4.000 0 99.7 90 110

Sample ID	<b>N029510-008BMS</b>	SampType:	<b>MS</b>	TestCode:	<b>300_W_SO4P</b>	Units:	<b>mg/L</b>	Prep Date:		RunNo:	<b>123261</b>
Client ID:	<b>ZZZZZZ</b>	Batch ID:	<b>R123261</b>	TestNo:	<b>EPA 300.0</b>			Analysis Date:	<b>4/9/2018</b>	SeqNo:	<b>2987467</b>
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD RPDLimit Qual

Sulfate 2235.240 100 800.0 1424 101 80 120

Sample ID	<b>N029510-008BMDS</b>	SampType:	<b>MSD</b>	TestCode:	<b>300_W_SO4P</b>	Units:	<b>mg/L</b>	Prep Date:		RunNo:	<b>123261</b>
Client ID:	<b>ZZZZZZ</b>	Batch ID:	<b>R123261</b>	TestNo:	<b>EPA 300.0</b>			Analysis Date:	<b>4/9/2018</b>	SeqNo:	<b>2987470</b>
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD RPDLimit Qual

Sulfate 2220.240 100 800.0 1424 99.6 80 120 2235 0.673 20

Sample ID	<b>N029510-011BDUP</b>	SampType:	<b>DUP</b>	TestCode:	<b>300_W_SO4P</b>	Units:	<b>mg/L</b>	Prep Date:		RunNo:	<b>123261</b>
Client ID:	<b>ZZZZZZ</b>	Batch ID:	<b>R123261</b>	TestNo:	<b>EPA 300.0</b>			Analysis Date:	<b>4/9/2018</b>	SeqNo:	<b>2987476</b>
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD RPDLimit Qual

Sulfate 2424.020 100 2430 0.244 20

### Qualifiers:

- |    |   |                                      |                                      |   |  |
|----|---|--------------------------------------|--------------------------------------|---|--|
| B  | Analyte detected in the associated Method Blank | E                                    | Value above quantitation range       | H | Holding times for preparation or analysis exceeded           |
| ND | Not Detected at the Reporting Limit             | R                                    | RPD outside accepted recovery limits | S | Spike/Surrogate outside of limits due to matrix interference |
| DO | Surrogate Diluted Out                           | Calculations are based on raw values |                                      |   |  |



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**ASSET Laboratories**
**ANALYTICAL RESULTS**
**Print Date:** 20-Apr-18

**CLIENT:** CH2M HILL  
**Lab Order:** N029640  
**Project:** PG&E Topock, 680375.02.IM.OP.00  
**Lab ID:** N029640-001

**Client Sample ID:** SC-700B-WDR-572  
**Collection Date:** 4/6/2018 6:20:00 PM  
**Matrix:** WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**NITRATE/NITRITE-N BY CADMIUM REDUCTION**
**SM4500-NO3F**

RunID: <b>NV00922-WC_180413B</b>	QC Batch: <b>R123352</b>			PrepDate		Analyst: <b>QBM</b>
Nitrate/Nitrite as N	2.7	0.16	0.25	mg/L	5	4/13/2018

**Qualifiers:** B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 S Spike/Surrogate outside of limits due to matrix interference  
 DO Surrogate Diluted Out  
 E Value above quantitation range  
 ND Not Detected at the Reporting Limit  
 Results are wet unless otherwise specified



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**CLIENT:** CH2M HILL  
**Work Order:** N029640  
**Project:** PG&E Topock, 680375.02.IM.OP.00

**ANALYTICAL QC SUMMARY REPORT****TestCode: 4500N03F\_W**

Sample ID <b>MB-R123352</b>	SampType: <b>MBLK</b>	TestCode: <b>4500N03F_W</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>123352</b>
Client ID: <b>PBW</b>	Batch ID: <b>R123352</b>	TestNo: <b>SM4500-NO3</b>		Analysis Date: <b>4/13/2018</b>	SeqNo: <b>2991904</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Nitrate/Nitrite as N ND 0.050

Sample ID <b>LCS-R123352</b>	SampType: <b>LCS</b>	TestCode: <b>4500N03F_W</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>123352</b>
Client ID: <b>LCSW</b>	Batch ID: <b>R123352</b>	TestNo: <b>SM4500-NO3</b>		Analysis Date: <b>4/13/2018</b>	SeqNo: <b>2991905</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Nitrate/Nitrite as N 0.508 0.050 0.5000 0 102 85 115

Sample ID <b>N029640-001DDUP</b>	SampType: <b>DUP</b>	TestCode: <b>4500N03F_W</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>123352</b>
Client ID: <b>ZZZZZZ</b>	Batch ID: <b>R123352</b>	TestNo: <b>SM4500-NO3</b>		Analysis Date: <b>4/13/2018</b>	SeqNo: <b>2991907</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Nitrate/Nitrite as N 2.986 0.25 2.730 8.98 20

Sample ID <b>N029632-003CMS</b>	SampType: <b>MS</b>	TestCode: <b>4500N03F_W</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>123352</b>
Client ID: <b>ZZZZZZ</b>	Batch ID: <b>R123352</b>	TestNo: <b>SM4500-NO3</b>		Analysis Date: <b>4/13/2018</b>	SeqNo: <b>2991911</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Nitrate/Nitrite as N 5.864 0.25 2.500 3.317 102 75 125

Sample ID <b>N029632-003CMSD</b>	SampType: <b>MSD</b>	TestCode: <b>4500N03F_W</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>123352</b>
Client ID: <b>ZZZZZZ</b>	Batch ID: <b>R123352</b>	TestNo: <b>SM4500-NO3</b>		Analysis Date: <b>4/13/2018</b>	SeqNo: <b>2991912</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Nitrate/Nitrite as N 5.715 0.25 2.500 3.317 95.9 75 125 5.864 2.57 20

**Qualifiers:**

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out	Calculations are based on raw values			



**ASSET LABORATORIES**  
ANALYTICAL SERVICES PROVIDED FOR ENVIRONMENTAL MONITORING

CALIFORNIA | P: 562.219.7435 F: 562.219.7436  
11110 Artesia Blvd., Ste B, Cerritos, CA 90703  
ELAP Cert 2921  
EPA ID CA01638

NEVADA | P: 702.307.2659 F: 702.307.2691  
3151 W. Post Rd., Las Vegas, NV 89118  
ELAP Cert 2676 | NV Cert NV00922  
ORELAP/NEAP Cert 4046

"Serving Clients with Passion and Professionalism"

TOTAL NUMBER OF CONTAINERS

**Special Instructions:**  
SC-700B Total metals List:  
Cr,Al,Sb,As,Ba,B,Cu,Pb,Mn,Mo,Ni,Fe,Zn

**Report Copy to**  
Doug Scott  
(970) 731-0636

## ASSET Laboratories

Please review the checklist below. Any NO signifies non-compliance. Any non-compliance will be noted and must be understood as having an impact on the quality of the data. All tests will be performed as requested regardless of any compliance issues.

If you have any questions or further instruction, please contact our Project Coordinator at (702) 307-2659.


Cooler Received/Opened On: 4/6/2018 Workorder: N029640  
 Rep sample Temp (Deg C): 2.9 IR Gun ID: 2  
 Temp Blank: ☒ Yes ☐ No  
 Carrier name: ASSET  
 Last 4 digits of Tracking No.: NA Packing Material Used: None  
 Cooling process: ☒ Ice ☐ Ice Pack ☐ Dry Ice ☐ Other ☐ None

### Sample Receipt Checklist

1. Shipping container/cooler in good condition?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
2. Custody seals intact, signed, dated on shipping container/cooler?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
3. Custody seals intact on sample bottles?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
4. Chain of custody present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
5. Sampler's name present in COC?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
6. Chain of custody signed when relinquished and received?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
7. Chain of custody agrees with sample labels?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
8. Samples in proper container/bottle?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
9. Sample containers intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
10. Sufficient sample volume for indicated test?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
11. All samples received within holding time?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
12. Temperature of rep sample or Temp Blank within acceptable limit?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	NA <input type="checkbox"/>
13. Water - VOA vials have zero headspace?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	NA <input checked="" type="checkbox"/>
14. Water - pH acceptable upon receipt? Example: pH > 12 for (CN,S); pH<2 for Metals	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	NA <input type="checkbox"/>
15. Did the bottle labels indicate correct preservatives used?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	NA <input checked="" type="checkbox"/>
16. Were there Non-Conformance issues at login?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	NA <input type="checkbox"/>
Was Client notified?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	NA <input checked="" type="checkbox"/>

Comments: Samples for Hex Cr were lab filtered and preserved with Ammonium buffer.  
 Samples for Metals were lab preserved with HN03 and for NH3/NO3 with H2SO4, pH adjusted to <2.

Checklist Completed By: YR  4/19/2018

Reviewed By:  04/20/2018

**ASSET Laboratories**

3151-3153 W Post Rd., Las Vegas, NV 89118

www.atl-labs.com

TEL: 7023072659

FAX: 7023072691

# CHAIN-OF-CUSTODY RECORD

Page 1 of 1

**QC Level: Level IV****Subcontractor:**BC Labs  
4100 Atlas Court  
Bakersfield, CA 93308TEL: (661) 327-4911  
FAX: (661) 327-1918  
Acct #:

Field Sampler: SIGNED

**09-Apr-18**


Sample ID	Matrix	Date Collected	Bottle Type	Requested Tests		
				SM4500-NH3D		
N029640-001A / SC-700B-WDR-572	Water	4/6/2018 6:20:00 PM	32OZP	1		

General Comments: Please email sample receipt acknowledgement to the PM.

Please use PO#:N29640A Please email Invoices and Account Receivable Statements to elvira@assetlaboratories.com. For questions, call Marlon at (702)-307-2659. Please e-mail results to reports.lv@assetlaboratories.com by: Normal TAT.

Please analyze for Ammonia by SM4500NH3D. EDD Requirement Labspec7 edata.

GSO #: 540127800

	<b>Date/Time</b>		<b>Date/Time</b>
Relinquished by: 	4/9/2018 17:00	Received by: _____	_____
Relinquished by: _____	_____	Received by: _____	_____



## List of Analysts

### ASSET Laboratories Work Order: N029640

NAME	TEST METHOD
Quennie Manimtim	SM 4500-NO3F
Claire Ignacio	EPA 200.7, EPA 200.8
Ria Abes	EPA 218.6, EPA 300.0
Lilia Ramit	EPA 120.1, SM 2540C, SM 2130B



**ASSET LABORATORIES**  
ANALYTICAL SUPPORT SERVICES FOR ENVIRONMENTAL TECHNOLOGIES

CALIFORNIA  
11110 Artesia Blvd., Ste B, Cerritos, CA 90703  
P: 562.219.7435 F: 562.219.7436

NEVADA  
3151 W. Post Rd., Las Vegas, NV 89118  
P: 702.307.2659 F: 702.307.2691

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**Laboratories, Inc.**

Environmental Testing Laboratory Since 1949



Date of Report: 05/09/2018

Marlon Cartin

ASSET Laboratories

3151-3153 W. Post Rd  
Las Vegas, NV 89118

Client Project: N030121  
BCL Project: Level IV  
BCL Work Order: 1814432  
Invoice ID: B303233

Enclosed are the results of analyses for samples received by the laboratory on 5/4/2018. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Contact Person: Vanessa Sandoval  
Client Service Rep

Stuart Buttram  
Technical Director

Certifications: CA ELAP #1186; NV #CA00014; OR ELAP #4032-001; AK UST101

*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*

All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



**Laboratories, Inc.**

Environmental Testing Laboratory Since 1949

Chain of Custody and Cooler Receipt Form for 1814432 Page 1 of 2

Page 1 of 1

**CHAIN-OF-CUSTODY RECORD**

18-14432



ASSET Laboratories  
3151-3153 W Post Rd., Las Vegas, NV 89118  
www.assetlabs.com  
TEL: 7023072659 FAX: 7023072691

**Subcontractor:**

BC Labs  
4100 Atlas Court  
Bakersfield, CA 93308

TEL: (661) 327-4911  
FAX: (661) 327-1918  
Acct #:

QC Level: Level IV

Field Sampler: SIGNED

03-May-18

Sample ID	Matrix	Date Collected	Bottle Type	Requested Tests
N030121-002A / SC-7008-WDR-573	Water	5/2/2018 1:33:00 PM	320ZP	SM4500-NH3D 1



General Comments: Please email sample receipt acknowledgement to the PM.

Please use P01N30121A Please email Invoices and Account Receivable Statements to elvira@assetlaboratories.com. For questions, call Marion at (702)-307-2659. Please e-mail results to reports.lv@assetlaboratories.com by Normal TAT.

Please analyze for Ammonia by SM4500NH3D. EDD Requirement Labspec7 edata.

GSO #: 540457054

Relinquished by:	Date/Time	Relinquished by:	Date/Time
[signature]	5/3/2018 17:00	[signature]	54.18 08:18



**Laboratories, Inc.**

Environmental Testing Laboratory Since 1949

Chain of Custody and Cooler Receipt Form for 1814432 Page 2 of 2

BC LABORATORIES INC.		COOLER RECEIPT FORM		Page 1 Of 1																																																																																																																																																																																																																																																																																																																																																																																																																																																														
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Comments:

Sample Numbering Completed By: am

Date/Time: 5-4-18

Rev 21 05/23/2016

A = Actual / C = Corrected

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The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

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**Laboratories, Inc.**

Environmental Testing Laboratory Since 1949



ASSET Laboratories  
3151-3153 W. Post Rd  
Las Vegas, NV 89118

**Reported:** 05/09/2018 13:33  
**Project:** Level IV  
**Project Number:** N030121  
**Project Manager:** Marlon Cartin

## Laboratory / Client Sample Cross Reference

Laboratory	Client Sample Information			
1814432-01	<b>COC Number:</b>	---	<b>Receive Date:</b>	05/04/2018 08:15
	<b>Project Number:</b>	---	<b>Sampling Date:</b>	05/02/2018 13:33
	<b>Sampling Location:</b>	---	<b>Sample Depth:</b>	---
	<b>Sampling Point:</b>	N030121-002A / SC-700B-WDR-573	<b>Lab Matrix:</b>	Water
	<b>Sampled By:</b>	---	<b>Sample Type:</b>	Water

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ASSET Laboratories  
3151-3153 W. Post Rd  
Las Vegas, NV 89118

**Reported:** 05/09/2018 13:33  
**Project:** Level IV  
**Project Number:** N030121  
**Project Manager:** Marlon Cartin

## Water Analysis (General Chemistry)

<b>BCL Sample ID:</b>	1814432-01	<b>Client Sample Name:</b>	N030121-002A / SC-700B-WDR-573, 5/2/2018 1:33:00PM					
<b>Constituent</b>	<b>Result</b>	<b>Units</b>	<b>PQL</b>	<b>MDL</b>	<b>Method</b>	<b>MB Bias</b>	<b>Lab Quals</b>	<b>Run #</b>
Ammonia as N (Distilled)	ND	mg/L	0.20		SM-4500-NH3G	ND		1

<b>Run #</b>	<b>Method</b>	<b>Prep Date</b>	<b>Run Date/Time</b>	<b>Analyst</b>	<b>Instrument</b>	<b>Dilution</b>	<b>QC Batch ID</b>
1	SM-4500-NH3G	05/07/18 08:56	05/07/18 16:15	JMH	SC-1	1	B012922

*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*

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Las Vegas, NV 89118

**Reported:** 05/09/2018 13:33  
**Project:** Level IV  
**Project Number:** N030121  
**Project Manager:** Marlon Cartin

## Water Analysis (General Chemistry)

### Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
<b>QC Batch ID: B012922</b>						
Ammonia as N (Distilled)	B012922-BLK1	ND	mg/L	0.20		



**Laboratories, Inc.**

Environmental Testing Laboratory Since 1949



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3151-3153 W. Post Rd  
Las Vegas, NV 89118

**Reported:** 05/09/2018 13:33  
**Project:** Level IV  
**Project Number:** N030121  
**Project Manager:** Marlon Cartin

## Water Analysis (General Chemistry)

### Quality Control Report - Laboratory Control Sample

								<u>Control Limits</u>		
Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Percent Recovery	RPD	Lab
Quals										
QC Batch ID: B012922										
	Ammonia as N (Distilled)	B012922-BS1	LCS	1.0014	1.0000	mg/L	100	85 - 115		

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Las Vegas, NV 89118

**Reported:** 05/09/2018 13:33  
**Project:** Level IV  
**Project Number:** N030121  
**Project Manager:** Marlon Cartin

## Water Analysis (General Chemistry)

### Quality Control Report - Precision & Accuracy

										Control Limits	
Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	RPD	Percent Recovery	Lab Quals
QC Batch ID: B012922		Used client sample: Y - Description: N030121-002A / SC-700B-WDR-573, 05/02/2018 13:33									
Ammonia as N (Distilled)	DUP	1814432-01	0.14580	ND		mg/L			20		
	MS	1814432-01	0.14580	1.1318	1.0000	mg/L		98.6		80 - 120	
	MSD	1814432-01	0.14580	1.3108	1.0000	mg/L	14.7	116	20	80 - 120	

May 17, 2018

Doug Scott  
CH2M HILL  
155 Grand Avenue, Suite 1000  
Oakland, CA 94612  
TEL: (970) 731-0636  
FAX: (510) 622-9129

Workorder No.: N030121

RE: PG&E Topock, 680375.03.IM.OP.00

Attention: Doug Scott

Enclosed are the results for sample(s) received on May 02, 2018 by ASSET Laboratories . The sample(s) are tested for the parameters as indicated in the enclosed chain of custody in accordance with the applicable laboratory certifications.

Thank you for the opportunity to service the needs of your company.

Please feel free to call me at (702) 307-2659 if I can be of further assistance to your company.

Sincerely,

*Nancy Libucano Tor*

Quennie Manimtim  
Laboratory Director

The cover letter is an integral part of this analytical report. This Laboratory Report cannot be reproduced in part or in its entirety without written permission from the client and Advanced Technology Laboratories - Las Vegas.



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---

**CLIENT:** CH2M HILL  
**Project:** PG&E Topock, 680375.03.IM.OP.00  
**Lab Order:** N030121

---

**CASE NARRATIVE****SAMPLE RECEIVING/GENERAL COMMENTS:**

All sample containers were received intact with proper chain of custody documentation.

Information on sample receipt conditions including discrepancies can be found in attached Sample Receipt Checklist Form.

Cooler temperature and sample preservation were verified upon receipt of samples if applicable.

Samples were analyzed within method holding time.

**Subcontracted Analyses:**

Ammonia was subcontracted to BC Labs- Bakersfield,CA.



**ASSET Laboratories**

Date: 17-May-18

**CLIENT:** CH2M HILL  
**Project:** PG&E Topock, 680375.03.IM.OP.00  
**Lab Order:** N030121  
**Contract No:** IM3PLANT-AR

**Work Order Sample Summary**

Lab Sample ID	Client Sample ID	Matrix	Collection Date	Date Received	Date Reported
N030121-001A	SC-100B-WDR-573	Water	5/2/2018 1:30:00 PM	5/2/2018	5/17/2018
N030121-001B	SC-100B-WDR-573	Water	5/2/2018 1:30:00 PM	5/2/2018	5/17/2018
N030121-001C	SC-100B-WDR-573	Water	5/2/2018 1:30:00 PM	5/2/2018	5/17/2018
N030121-002A	SC-700B-WDR-573	Water	5/2/2018 1:33:00 PM	5/2/2018	5/17/2018
N030121-002B	SC-700B-WDR-573	Water	5/2/2018 1:33:00 PM	5/2/2018	5/17/2018
N030121-002C	SC-700B-WDR-573	Water	5/2/2018 1:33:00 PM	5/2/2018	5/17/2018
N030121-002D	SC-700B-WDR-573	Water	5/2/2018 1:33:00 PM	5/2/2018	5/17/2018
N030121-002E	SC-700B-WDR-573	Water	5/2/2018 1:33:00 PM	5/2/2018	5/17/2018



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**ASSET Laboratories**
**ANALYTICAL RESULTS**
**Print Date:** 17-May-18

**CLIENT:** CH2M HILL  
**Lab Order:** N030121  
**Project:** PG&E Topock, 680375.03.IM.OP.00  
**Lab ID:** N030121-001

**Client Sample ID:** SC-100B-WDR-573  
**Collection Date:** 5/2/2018 1:30:00 PM  
**Matrix:** WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**SPECIFIC CONDUCTANCE**
**EPA 120.1**

RunID: <b>NV00922-WC_180503E</b>	QC Batch: <b>R123829</b>			PrepDate		Analyst: <b>LR</b>
Specific Conductance	7200	0.10	0.10	umhos/cm	1	5/3/2018 02:00 PM

**Qualifiers:** B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 S Spike/Surrogate outside of limits due to matrix interference  
 DO Surrogate Diluted Out  
 E Value above quantitation range  
 ND Not Detected at the Reporting Limit  
 Results are wet unless otherwise specified



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**ASSET Laboratories**
**ANALYTICAL RESULTS**
**Print Date:** 17-May-18

**CLIENT:** CH2M HILL  
**Lab Order:** N030121  
**Project:** PG&E Topock, 680375.03.IM.OP.00  
**Lab ID:** N030121-002

**Client Sample ID:** SC-700B-WDR-573  
**Collection Date:** 5/2/2018 1:33:00 PM  
**Matrix:** WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**SPECIFIC CONDUCTANCE**
**EPA 120.1**

RunID: <b>NV00922-WC_180503E</b>	QC Batch: <b>R123829</b>			PrepDate		Analyst: <b>LR</b>
Specific Conductance	7000	0.10	0.10	umhos/cm	1	5/3/2018 02:00 PM

**Qualifiers:** B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 S Spike/Surrogate outside of limits due to matrix interference  
 DO Surrogate Diluted Out  
 E Value above quantitation range  
 ND Not Detected at the Reporting Limit  
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**CLIENT:** CH2M HILL  
**Work Order:** N030121  
**Project:** PG&E Topock, 680375.03.IM.OP.00

**ANALYTICAL QC SUMMARY REPORT****TestCode: 120.1\_WPGE**

Sample ID	<b>N030123-003BDUP</b>	SampType:	<b>DUP</b>	TestCode:	<b>120.1_WPGE</b>	Units:	<b>umhos/cm</b>	Prep Date:		RunNo:	<b>123829</b>
Client ID:	<b>ZZZZZZ</b>	Batch ID:	<b>R123829</b>	TestNo:	<b>EPA 120.1</b>			Analysis Date:	<b>5/3/2018</b>	SeqNo:	<b>3015754</b>
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD RPDLimit Qual
Specific Conductance		16470.000		0.10						16420	0.304 2

Sample ID	<b>N030123-010BDUP</b>	SampType:	<b>DUP</b>	TestCode:	<b>120.1_WPGE</b>	Units:	<b>umhos/cm</b>	Prep Date:		RunNo:	<b>123829</b>
Client ID:	<b>ZZZZZZ</b>	Batch ID:	<b>R123829</b>	TestNo:	<b>EPA 120.1</b>			Analysis Date:	<b>5/3/2018</b>	SeqNo:	<b>3015762</b>
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD RPDLimit Qual
Specific Conductance		21400.000		0.10						21500	0.466 2

**Qualifiers:**

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference

Calculations are based on raw values

**ASSET LABORATORIES**

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**ASSET Laboratories**
**ANALYTICAL RESULTS**
**Print Date:** 17-May-18

**CLIENT:** CH2M HILL  
**Lab Order:** N030121  
**Project:** PG&E Topock, 680375.03.IM.OP.00  
**Lab ID:** N030121-001

**Client Sample ID:** SC-100B-WDR-573  
**Collection Date:** 5/2/2018 1:30:00 PM  
**Matrix:** WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**TOTAL FILTERABLE RESIDUE**
**SM2540C**

RunID: <b>NV00922-WC_180507J</b>	QC Batch: <b>67983</b>				PrepDate	<b>5/7/2018</b>	Analyst: <b>LR</b>
Total Dissolved Solids (Residue, Filterable)	4200	50	50		mg/L	1	5/7/2018 01:18 PM

**Qualifiers:** B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 S Spike/Surrogate outside of limits due to matrix interference  
 DO Surrogate Diluted Out  
 E Value above quantitation range  
 ND Not Detected at the Reporting Limit  
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**ASSET Laboratories**
**ANALYTICAL RESULTS**
**Print Date:** 17-May-18

**CLIENT:** CH2M HILL  
**Lab Order:** N030121  
**Project:** PG&E Topock, 680375.03.IM.OP.00  
**Lab ID:** N030121-002

**Client Sample ID:** SC-700B-WDR-573  
**Collection Date:** 5/2/2018 1:33:00 PM  
**Matrix:** WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**TOTAL FILTERABLE RESIDUE**
**SM2540C**

RunID: <b>NV00922-WC_180507J</b>	QC Batch: <b>67983</b>				PrepDate	<b>5/7/2018</b>	Analyst: <b>LR</b>
Total Dissolved Solids (Residue, Filterable)	4000	50	50		mg/L	1	5/7/2018 01:18 PM

**Qualifiers:** B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 S Spike/Surrogate outside of limits due to matrix interference  
 DO Surrogate Diluted Out  
 E Value above quantitation range  
 ND Not Detected at the Reporting Limit  
 Results are wet unless otherwise specified



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**CLIENT:** CH2M HILL  
**Work Order:** N030121  
**Project:** PG&E Topock, 680375.03.IM.OP.00

**ANALYTICAL QC SUMMARY REPORT****TestCode: 160.1\_2540C\_W**

Sample ID	LCS-67983	SampType:	LCS	TestCode:	160.1_2540C	Units:	mg/L	Prep Date:	5/7/2018	RunNo:	123934			
Client ID:	LCSW	Batch ID:	67983	TestNo:	SM2540C			Analysis Date:	5/7/2018	SeqNo:	3021096			
Analyte		Result		PQL	SPK value	SPK Ref Val		%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera		991.000		10	1000	0		99.1	80	120				

Sample ID	MB-67983	SampType:	MBLK	TestCode:	160.1_2540C	Units:	mg/L	Prep Date:	5/7/2018	RunNo:	123934			
Client ID:	PBW	Batch ID:	67983	TestNo:	SM2540C			Analysis Date:	5/7/2018	SeqNo:	3021097			
Analyte		Result		PQL	SPK value	SPK Ref Val		%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera		ND		10										

Sample ID	N030186-002BDUP	SampType:	DUP	TestCode:	160.1_2540C	Units:	mg/L	Prep Date:	5/7/2018	RunNo:	123934			
Client ID:	ZZZZZZ	Batch ID:	67983	TestNo:	SM2540C			Analysis Date:	5/7/2018	SeqNo:	3021108			
Analyte		Result		PQL	SPK value	SPK Ref Val		%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera		4275.000		50							4125	3.57	5	

**Qualifiers:**

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference

Calculations are based on raw values

**ASSET LABORATORIES**

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**ASSET Laboratories**
**ANALYTICAL RESULTS**
**Print Date:** 17-May-18

**CLIENT:** CH2M HILL  
**Lab Order:** N030121  
**Project:** PG&E Topock, 680375.03.IM.OP.00  
**Lab ID:** N030121-002

**Client Sample ID:** SC-700B-WDR-573  
**Collection Date:** 5/2/2018 1:33:00 PM  
**Matrix:** WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**TOTAL METALS BY ICP**
**EPA 200.7**

RunID: NV00922-ICP2_180515D	QC Batch: 68038	PrepDate	5/10/2018	Analyst: CEI
Aluminum	ND 40	50	µg/L	1 5/16/2018 01:45 AM
Boron	1100 74	100	µg/L	1 5/16/2018 01:45 AM
Iron	ND 18	20	µg/L	1 5/16/2018 01:45 AM

**Qualifiers:** B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 S Spike/Surrogate outside of limits due to matrix interference  
 DO Surrogate Diluted Out  
 E Value above quantitation range  
 ND Not Detected at the Reporting Limit  
 Results are wet unless otherwise specified



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**CLIENT:** CH2M HILL  
**Work Order:** N030121  
**Project:** PG&E Topock, 680375.03.IM.OP.00

**ANALYTICAL QC SUMMARY REPORT****TestCode: 200.7\_WPGEPBP**

Sample ID	MB-68038	SampType:	MBLK	TestCode:	200.7_WPGE	Units:	µg/L	Prep Date:	5/10/2018	RunNo:	124085		
Client ID:	PBW	Batch ID:	68038	TestNo:	EPA 200.7			Analysis Date:	5/16/2018	SeqNo:	3028410		
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Aluminum	ND	50									
Boron	ND	100									
Iron	ND	20									

Sample ID	LCS1-68038	SampType:	LCS	TestCode:	200.7_WPGE	Units:	µg/L	Prep Date:	5/10/2018	RunNo:	124085		
Client ID:	LCSW	Batch ID:	68038	TestNo:	EPA 200.7			Analysis Date:	5/16/2018	SeqNo:	3028411		
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Aluminum	10032.340	50	10000	0	100	85	115				
Boron	4612.856	100	5000	0	92.3	85	115				
Iron	107.088	20	100.0	0	107	85	115				

Sample ID	N030121-002E-MS1	SampType:	MS	TestCode:	200.7_WPGE	Units:	µg/L	Prep Date:	5/10/2018	RunNo:	124085		
Client ID:	ZZZZZZ	Batch ID:	68038	TestNo:	EPA 200.7			Analysis Date:	5/16/2018	SeqNo:	3028415		
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Aluminum	10406.765	50	10000	0	104	75	125				
Boron	5731.148	100	5000	1063	93.4	75	125				
Iron	118.613	20	100.0	0	119	75	125				

Sample ID	N030121-002E-MSD	SampType: MSD	TestCode: 200.7_WPGE	Units: µg/L	Prep Date: 5/10/2018	RunNo: 124085					
Client ID: ZZZZZZ	Batch ID: 68038	TestNo: EPA 200.7		Analysis Date: 5/16/2018	SeqNo: 3028416						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Aluminum	10349.136	50	10000	0	103	75	125	10410	0.555	20	
Boron	5709.416	100	5000	1063	92.9	75	125	5731	0.380	20	
Iron	118.925	20	100.0	0	119	75	125	118.6	0.262	20	

**Qualifiers:**

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference

Calculations are based on raw values



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**ASSET Laboratories**
**ANALYTICAL RESULTS**
**Print Date:** 17-May-18

**CLIENT:** CH2M HILL  
**Lab Order:** N030121  
**Project:** PG&E Topock, 680375.03.IM.OP.00  
**Lab ID:** N030121-001

**Client Sample ID:** SC-100B-WDR-573  
**Collection Date:** 5/2/2018 1:30:00 PM  
**Matrix:** WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**TOTAL METALS BY ICPMS**
**EPA 200.8**

RunID: <b>NV00922-ICP7_180515E</b>	QC Batch: <b>68083</b>			PrepDate	<b>5/15/2018</b>	Analyst: <b>CEI</b>
Manganese	7.2	0.26	0.50	µg/L	1	5/15/2018 09:44 PM

**Qualifiers:** B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 S Spike/Surrogate outside of limits due to matrix interference  
 DO Surrogate Diluted Out  
 E Value above quantitation range  
 ND Not Detected at the Reporting Limit  
 Results are wet unless otherwise specified



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**ASSET Laboratories**
**ANALYTICAL RESULTS**
**Print Date:** 17-May-18

**CLIENT:** CH2M HILL  
**Lab Order:** N030121  
**Project:** PG&E Topock, 680375.03.IM.OP.00  
**Lab ID:** N030121-002

**Client Sample ID:** SC-700B-WDR-573  
**Collection Date:** 5/2/2018 1:33:00 PM  
**Matrix:** WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**TOTAL METALS BY ICPMS**
**EPA 200.8**

RunID: NV00922-ICP7_180515E	QC Batch: 68083	PrepDate	5/15/2018	Analyst: CEI		
Antimony	ND	0.16	0.50	µg/L	1	5/15/2018 09:55 PM
Arsenic	ND	0.081	0.10	µg/L	1	5/15/2018 09:55 PM
Barium	19	0.15	1.0	µg/L	1	5/15/2018 09:55 PM
Copper	ND	0.55	1.0	µg/L	1	5/15/2018 09:55 PM
Lead	ND	0.13	1.0	µg/L	1	5/15/2018 09:55 PM
Manganese	9.1	0.26	0.50	µg/L	1	5/15/2018 09:55 PM
Molybdenum	22	0.21	0.50	µg/L	1	5/15/2018 09:55 PM
Nickel	ND	0.26	1.0	µg/L	1	5/15/2018 09:55 PM
Zinc	ND	2.3	10	µg/L	1	5/15/2018 09:55 PM

**Qualifiers:** B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 S Spike/Surrogate outside of limits due to matrix interference  
 DO Surrogate Diluted Out  
 E Value above quantitation range  
 ND Not Detected at the Reporting Limit  
 Results are wet unless otherwise specified



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CLIENT: CH2M HILL  
 Work Order: N030121  
 Project: PG&E Topock, 680375.03.IM.OP.00

## ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8\_W

Sample ID	MB-68083	SampType:	MBLK	TestCode:	200.8_W	Units:	µg/L	Prep Date:	5/15/2018	RunNo:	124087
Client ID:	PBW	Batch ID:	68083	TestNo:	EPA 200.8			Analysis Date:	5/15/2018	SeqNo:	3027853
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Antimony	ND	0.50									
Arsenic	ND	0.10									
Barium	ND	1.0									
Copper	ND	1.0									
Lead	ND	1.0									
Manganese	ND	0.50									
Molybdenum	ND	0.50									
Nickel	ND	1.0									
Zinc	ND	10									

Sample ID	LCS-68083	SampType:	LCS	TestCode:	200.8_W	Units:	µg/L	Prep Date:	5/15/2018	RunNo:	124087
Client ID:	LCSW	Batch ID:	68083	TestNo:	EPA 200.8			Analysis Date:	5/15/2018	SeqNo:	3027854
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Antimony	9.368	0.50	10.00	0	93.7	85	115				
Arsenic	10.243	0.10	10.00	0	102	85	115				
Barium	10.075	1.0	10.00	0	101	85	115				
Copper	10.538	1.0	10.00	0	105	85	115				
Lead	9.560	1.0	10.00	0	95.6	85	115				
Manganese	103.502	0.50	100.0	0	104	85	115				
Molybdenum	9.838	0.50	10.00	0	98.4	85	115				
Nickel	10.906	1.0	10.00	0	109	85	115				
Zinc	91.572	10	100.0	0	91.6	85	115				

Sample ID	N030186-001D-MS	SampType:	MS	TestCode:	200.8_W	Units:	µg/L	Prep Date:	5/15/2018	RunNo:	124087
Client ID:	ZZZZZZ	Batch ID:	68083	TestNo:	EPA 200.8			Analysis Date:	5/15/2018	SeqNo:	3027868
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

## Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference

Calculations are based on raw values



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**CLIENT:** CH2M HILL  
**Work Order:** N030121  
**Project:** PG&E Topock, 680375.03.IM.OP.00

## ANALYTICAL QC SUMMARY REPORT

**TestCode:** 200.8\_W

Sample ID	<b>N030186-001D-MS</b>	SampType:	<b>MS</b>	TestCode:	<b>200.8_W</b>	Units:	<b>µg/L</b>	Prep Date:	<b>5/15/2018</b>	RunNo:	<b>124087</b>
Client ID:	<b>ZZZZZZ</b>	Batch ID:	<b>68083</b>	TestNo:	<b>EPA 200.8</b>			Analysis Date:	<b>5/15/2018</b>	SeqNo:	<b>3027868</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	10.094	0.50	10.00	0	101	75	125				
Arsenic	12.108	0.10	10.00	1.467	106	75	125				
Barium	37.164	1.0	10.00	27.94	92.3	75	125				
Copper	22.278	1.0	10.00	13.65	86.3	75	125				
Lead	9.868	1.0	10.00	0	98.7	75	125				
Molybdenum	19.297	0.50	10.00	7.633	117	75	125				
Nickel	21.089	1.0	10.00	12.48	86.0	75	125				
Zinc	121.038	10	100.0	11.54	109	75	125				

Sample ID	<b>N030186-001D-MS</b>	SampType:	<b>MS</b>	TestCode:	<b>200.8_W</b>	Units:	<b>µg/L</b>	Prep Date:	<b>5/15/2018</b>	RunNo:	<b>124087</b>
Client ID:	<b>ZZZZZZ</b>	Batch ID:	<b>68083</b>	TestNo:	<b>EPA 200.8</b>			Analysis Date:	<b>5/15/2018</b>	SeqNo:	<b>3027869</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	402.366	2.5	100.0	306.9	95.5	75	125				

Sample ID	<b>N030186-001D-MSD</b>	SampType:	<b>MSD</b>	TestCode:	<b>200.8_W</b>	Units:	<b>µg/L</b>	Prep Date:	<b>5/15/2018</b>	RunNo:	<b>124087</b>
Client ID:	<b>ZZZZZZ</b>	Batch ID:	<b>68083</b>	TestNo:	<b>EPA 200.8</b>			Analysis Date:	<b>5/15/2018</b>	SeqNo:	<b>3027870</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	10.114	0.50	10.00	0	101	75	125	10.09	0.193	20	
Arsenic	12.151	0.10	10.00	1.467	107	75	125	12.11	0.357	20	
Barium	37.054	1.0	10.00	27.94	91.2	75	125	37.16	0.295	20	
Copper	22.717	1.0	10.00	13.65	90.7	75	125	22.28	1.95	20	
Lead	9.939	1.0	10.00	0	99.4	75	125	9.868	0.721	20	
Molybdenum	19.101	0.50	10.00	7.633	115	75	125	19.30	1.02	20	
Nickel	21.208	1.0	10.00	12.48	87.2	75	125	21.09	0.565	20	
Zinc	123.139	10	100.0	11.54	112	75	125	121.0	1.72	20	

### Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference

Calculations are based on raw values



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**CLIENT:** CH2M HILL  
**Work Order:** N030121  
**Project:** PG&E Topock, 680375.03.IM.OP.00

## ANALYTICAL QC SUMMARY REPORT

**TestCode:** 200.8\_W

Sample ID	N030186-001D-MSD	SampType:	MSD	TestCode:	200.8_W	Units:	µg/L	Prep Date:	5/15/2018	RunNo:	124087		
Client ID:	ZZZZZZ	Batch ID:	68083	TestNo:	EPA 200.8			Analysis Date:	5/15/2018	SeqNo:	3027871		
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese		400.866		2.5	100.0	306.9	94.0	75	125	402.4	0.373	20	

### Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference

Calculations are based on raw values



**ASSET LABORATORIES**

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**ASSET Laboratories**
**ANALYTICAL RESULTS**
**Print Date:** 17-May-18

**CLIENT:** CH2M HILL  
**Lab Order:** N030121  
**Project:** PG&E Topock, 680375.03.IM.OP.00  
**Lab ID:** N030121-001

**Client Sample ID:** SC-100B-WDR-573  
**Collection Date:** 5/2/2018 1:30:00 PM  
**Matrix:** WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**HEXAVALENT CHROMIUM BY IC**
**EPA 218.6**

RunID: <b>NV00922-IC7_180507A</b>	QC Batch: <b>R123917</b>				PrepDate		Analyst: <b>RAB</b>
Hexavalent Chromium	480	3.3	20		µg/L	100	5/7/2018 10:36 AM

**TOTAL METALS BY ICPMS**
**EPA 200.8**

RunID: <b>NV00922-ICP7_180515E</b>	QC Batch: <b>68083</b>				PrepDate	<b>5/15/2018</b>	Analyst: <b>CEI</b>
Chromium	480	0.65	5.0		µg/L	5	5/15/2018 09:50 PM

<b>Qualifiers:</b>	B	Analyte detected in the associated Method Blank	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
	DO	Surrogate Diluted Out		



**ASSET LABORATORIES**  
ANALYTICAL SUPPORT SERVICES FOR ENVIRONMENTAL TECHNOLOGIES

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**ASSET Laboratories**
**ANALYTICAL RESULTS**
**Print Date:** 17-May-18

**CLIENT:** CH2M HILL  
**Lab Order:** N030121  
**Project:** PG&E Topock, 680375.03.IM.OP.00  
**Lab ID:** N030121-002

**Client Sample ID:** SC-700B-WDR-573  
**Collection Date:** 5/2/2018 1:33:00 PM  
**Matrix:** WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**HEXAVALENT CHROMIUM BY IC**
**EPA 218.6**

RunID: <b>NV00922-IC7_180507A</b>	QC Batch: <b>R123917</b>			PrepDate		Analyst: <b>RAB</b>
Hexavalent Chromium	ND	0.033	0.20	µg/L	1	5/7/2018 10:57 AM

**TOTAL METALS BY ICPMS**
**EPA 200.8**

RunID: <b>NV00922-ICP7_180515E</b>	QC Batch: <b>68083</b>			PrepDate	<b>5/15/2018</b>	Analyst: <b>CEI</b>
Chromium	ND	0.13	1.0	µg/L	1	5/15/2018 09:55 PM

**Qualifiers:** B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 S Spike/Surrogate outside of limits due to matrix interference  
 DO Surrogate Diluted Out  
 E Value above quantitation range  
 ND Not Detected at the Reporting Limit  
 Results are wet unless otherwise specified



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**CLIENT:** CH2M HILL  
**Work Order:** N030121  
**Project:** PG&E Topock, 680375.03.IM.OP.00

**ANALYTICAL QC SUMMARY REPORT****TestCode: 200.8\_W\_CRPGE**

Sample ID	MB-68083	SampType:	MBLK	TestCode:	200.8_W_CR	Units:	µg/L	Prep Date:	5/15/2018	RunNo:	124087		
Client ID:	PBW	Batch ID:	68083	TestNo:	EPA 200.8			Analysis Date:	5/15/2018	SeqNo:	3027571		
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium		ND		1.0									

Sample ID	LCS-68083	SampType:	LCS	TestCode:	200.8_W_CR	Units:	µg/L	Prep Date:	5/15/2018	RunNo:	124087		
Client ID:	LCSW	Batch ID:	68083	TestNo:	EPA 200.8			Analysis Date:	5/15/2018	SeqNo:	3027572		
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium		10.098		1.0	10.00	0	101	85	115				

Sample ID	N030186-001D-MS	SampType:	MS	TestCode:	200.8_W_CR	Units:	µg/L	Prep Date:	5/15/2018	RunNo:	124087		
Client ID:	ZZZZZZ	Batch ID:	68083	TestNo:	EPA 200.8			Analysis Date:	5/15/2018	SeqNo:	3027586		
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium		11.894		1.0	10.00	1.818	101	75	125				

Sample ID	N030186-001D-MSD	SampType:	MSD	TestCode:	200.8_W_CR	Units:	µg/L	Prep Date:	5/15/2018	RunNo:	124087		
Client ID:	ZZZZZZ	Batch ID:	68083	TestNo:	EPA 200.8			Analysis Date:	5/15/2018	SeqNo:	3027588		
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium		11.815		1.0	10.00	1.818	100	75	125	11.89	0.672	20	

**Qualifiers:**

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference

Calculations are based on raw values

**ASSET LABORATORIES**

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**CLIENT:** CH2M HILL  
**Work Order:** N030121  
**Project:** PG&E Topock, 680375.03.IM.OP.00

## ANALYTICAL QC SUMMARY REPORT

**TestCode:** 218.6\_WU\_PGE

Sample ID	MB-R123917	SampType:	MBLK	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	123917			
Client ID:	PBW	Batch ID:	R123917	TestNo:	EPA 218.6			Analysis Date:	5/7/2018	SeqNo:	3020294			
Analyte		Result		PQL	SPK value	SPK Ref Val		%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Hexavalent Chromium ND 0.20

Sample ID	LCS-R123917	SampType:	LCS	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	123917			
Client ID:	LCSW	Batch ID:	R123917	TestNo:	EPA 218.6			Analysis Date:	5/7/2018	SeqNo:	3020295			
Analyte		Result		PQL	SPK value	SPK Ref Val		%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Hexavalent Chromium 5.144 0.20 5.000 0 103 90 110

Sample ID	N030121-001BMS	SampType:	MS	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	123917			
Client ID:	ZZZZZZ	Batch ID:	R123917	TestNo:	EPA 218.6			Analysis Date:	5/7/2018	SeqNo:	3020300			
Analyte		Result		PQL	SPK value	SPK Ref Val		%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Hexavalent Chromium 1001.170 20 500.0 476.1 105 90 110

Sample ID	N030121-002CMS	SampType:	MS	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	123917			
Client ID:	ZZZZZZ	Batch ID:	R123917	TestNo:	EPA 218.6			Analysis Date:	5/7/2018	SeqNo:	3020304			
Analyte		Result		PQL	SPK value	SPK Ref Val		%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Hexavalent Chromium 0.912 0.20 1.000 0 91.2 90 110

Sample ID	N030123-004AMS	SampType:	MS	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	123917			
Client ID:	ZZZZZZ	Batch ID:	R123917	TestNo:	EPA 218.6			Analysis Date:	5/7/2018	SeqNo:	3020312			
Analyte		Result		PQL	SPK value	SPK Ref Val		%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Hexavalent Chromium 122.985 2.0 50.00 72.82 100 90 110

### Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference

Calculations are based on raw values



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**CLIENT:** CH2M HILL  
**Work Order:** N030121  
**Project:** PG&E Topock, 680375.03.IM.OP.00

## ANALYTICAL QC SUMMARY REPORT

**TestCode:** 218.6\_WU\_PGE

Sample ID	N030121-001BDUP	SampType:	DUP	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	123917		
Client ID:	ZZZZZZ	Batch ID:	R123917	TestNo:	EPA 218.6			Analysis Date:	5/7/2018	SeqNo:	3020319		
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium		467.550		20						476.1	1.81	20	

Sample ID	N030123-004AMSD	SampType: MSD	TestCode: 218.6_WU_P	Units: µg/L	Prep Date:				RunNo: 123917			
Client ID: ZZZZZZ		Batch ID: R123917	TestNo: EPA 218.6		Analysis Date: 5/7/2018				SeqNo: 3020320			
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium		124.708	2.0	50.00	72.82	104	90	110	123.0	1.39	20	

### Qualifiers:

- |    |   |   |                                      |   |  |
|----|---|---|--------------------------------------|---|--|
| B  | Analyte detected in the associated Method Blank | E | Value above quantitation range       | H | Holding times for preparation or analysis exceeded           |
| ND | Not Detected at the Reporting Limit             | R | RPD outside accepted recovery limits | S | Spike/Surrogate outside of limits due to matrix interference |
- Calculations are based on raw values



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# ASSET Laboratories

# ANALYTICAL RESULTS

Print Date: 17-May-18

CLIENT: CH2M HILL  
 Lab Order: N030121  
 Project: PG&E Topock, 680375.03.IM.OP.00  
 Lab ID: N030121-001

Client Sample ID: SC-100B-WDR-573  
 Collection Date: 5/2/2018 1:30:00 PM  
 Matrix: WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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## TURBIDITY

## SM 2130B

RunID: NV00922-WC_180503H	QC Batch: R123832	PrepDate	Analyst: LR
Turbidity	0.16 0.10 0.10	NTU	1 5/3/2018 04:20 PM

**Qualifiers:** B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 S Spike/Surrogate outside of limits due to matrix interference  
 DO Surrogate Diluted Out  
 E Value above quantitation range  
 ND Not Detected at the Reporting Limit  
 Results are wet unless otherwise specified



**ASSET LABORATORIES**  
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"Serving Clients with Passion and Professionalism"

# ASSET Laboratories

# ANALYTICAL RESULTS

Print Date: 17-May-18

CLIENT: CH2M HILL  
 Lab Order: N030121  
 Project: PG&E Topock, 680375.03.IM.OP.00  
 Lab ID: N030121-002

Client Sample ID: SC-700B-WDR-573  
 Collection Date: 5/2/2018 1:33:00 PM  
 Matrix: WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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## TURBIDITY

## SM 2130B

RunID: NV00922-WC_180503H	QC Batch: R123832	PrepDate	Analyst: LR
Turbidity	0.16 0.10 0.10	NTU	1 5/3/2018 04:20 PM

**Qualifiers:** B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 S Spike/Surrogate outside of limits due to matrix interference  
 DO Surrogate Diluted Out  
 E Value above quantitation range  
 ND Not Detected at the Reporting Limit  
 Results are wet unless otherwise specified



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**CLIENT:** CH2M HILL  
**Work Order:** N030121  
**Project:** PG&E Topock, 680375.03.IM.OP.00

**ANALYTICAL QC SUMMARY REPORT****TestCode: 2130\_W**

Sample ID	MB-R123832	SampType:	MBLK	TestCode:	2130_W	Units:	NTU	Prep Date:		RunNo:	123832			
Client ID:	PBW	Batch ID:	R123832	TestNo:	SM 2130B			Analysis Date:	5/3/2018	SeqNo:	3015779			
Analyte		Result		PQL	SPK value	SPK Ref Val		%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Turbidity		ND		0.10										

Sample ID	N030121-001ADUP	SampType:	DUP	TestCode:	2130_W	Units:	NTU	Prep Date:		RunNo:	123832			
Client ID:	ZZZZZZ	Batch ID:	R123832	TestNo:	SM 2130B			Analysis Date:	5/3/2018	SeqNo:	3015781			
Analyte		Result		PQL	SPK value	SPK Ref Val		%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Turbidity		0.150		0.10							0.1600	6.45	30	

Sample ID	N030121-002BDUP	SampType:	DUP	TestCode:	2130_W	Units:	NTU	Prep Date:		RunNo:	123832			
Client ID:	ZZZZZZ	Batch ID:	R123832	TestNo:	SM 2130B			Analysis Date:	5/3/2018	SeqNo:	3015783			
Analyte		Result		PQL	SPK value	SPK Ref Val		%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Turbidity		0.170		0.10							0.1600	6.06	30	

**Qualifiers:**

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference

Calculations are based on raw values

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**ASSET Laboratories**
**ANALYTICAL RESULTS**
**Print Date:** 17-May-18

**CLIENT:** CH2M HILL  
**Lab Order:** N030121  
**Project:** PG&E Topock, 680375.03.IM.OP.00  
**Lab ID:** N030121-002

**Client Sample ID:** SC-700B-WDR-573  
**Collection Date:** 5/2/2018 1:33:00 PM  
**Matrix:** WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**ANIONS BY ION CHROMATOGRAPHY**
**EPA 300.0**

RunID: NV00922-IC8_180507A	QC Batch: R123903				PrepDate		Analyst: RAB
Fluoride	2.5	0.032	0.50		mg/L	5	5/7/2018 10:07 AM

**ANIONS BY ION CHROMATOGRAPHY**
**EPA 300.0**

RunID: NV00922-IC8_180507A	QC Batch: R123903				PrepDate		Analyst: RAB
Sulfate	470	1.1	25		mg/L	50	5/7/2018 07:01 PM

<b>Qualifiers:</b>	B	Analyte detected in the associated Method Blank	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
	DO	Surrogate Diluted Out		



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**CLIENT:** CH2M HILL  
**Work Order:** N030121  
**Project:** PG&E Topock, 680375.03.IM.OP.00

**ANALYTICAL QC SUMMARY REPORT****TestCode: 300\_W\_FPG**

Sample ID <b>MB-R123903_F</b>	SampType: <b>MBLK</b>	TestCode: <b>300_W_FPG</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>123903</b>
Client ID: <b>PBW</b>	Batch ID: <b>R123903</b>	TestNo: <b>EPA 300.0</b>		Analysis Date: <b>5/7/2018</b>	SeqNo: <b>3019448</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Fluoride ND 0.10

Sample ID <b>LCS-R123903_F</b>	SampType: <b>LCS</b>	TestCode: <b>300_W_FPG</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>123903</b>
Client ID: <b>LCSW</b>	Batch ID: <b>R123903</b>	TestNo: <b>EPA 300.0</b>		Analysis Date: <b>5/7/2018</b>	SeqNo: <b>3019449</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Fluoride 1.249 0.10 1.250 0 99.9 90 110

Sample ID <b>N030121-002BDUP</b>	SampType: <b>DUP</b>	TestCode: <b>300_W_FPG</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>123903</b>
Client ID: <b>ZZZZZZ</b>	Batch ID: <b>R123903</b>	TestNo: <b>EPA 300.0</b>		Analysis Date: <b>5/7/2018</b>	SeqNo: <b>3019457</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Fluoride 2.431 0.50 2.462 1.29 20

Sample ID <b>N030097-011AMS</b>	SampType: <b>MS</b>	TestCode: <b>300_W_FPG</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>123903</b>
Client ID: <b>ZZZZZZ</b>	Batch ID: <b>R123903</b>	TestNo: <b>EPA 300.0</b>		Analysis Date: <b>5/7/2018</b>	SeqNo: <b>3019461</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Fluoride 80.015 5.0 62.50 21.56 93.5 80 120

Sample ID <b>N030097-011AMSD</b>	SampType: <b>MSD</b>	TestCode: <b>300_W_FPG</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>123903</b>
Client ID: <b>ZZZZZZ</b>	Batch ID: <b>R123903</b>	TestNo: <b>EPA 300.0</b>		Analysis Date: <b>5/7/2018</b>	SeqNo: <b>3019462</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Fluoride 80.880 5.0 62.50 21.56 94.9 80 120 80.02 1.08 20

**Qualifiers:**

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference

Calculations are based on raw values



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ORELAP/NELAP Cert 4046

"Serving Clients with Passion and Professionalism"

**CLIENT:** CH2M HILL  
**Work Order:** N030121  
**Project:** PG&E Topock, 680375.03.IM.OP.00

## ANALYTICAL QC SUMMARY REPORT

**TestCode:** 300\_W\_SO4PGE

Sample ID	<b>MB-R123903_SO4</b>	SampType:	<b>MBLK</b>	TestCode:	<b>300_W_SO4P</b>	Units:	<b>mg/L</b>	Prep Date:		RunNo:	<b>123903</b>
Client ID:	<b>PBW</b>	Batch ID:	<b>R123903</b>	TestNo:	<b>EPA 300.0</b>			Analysis Date:	<b>5/7/2018</b>	SeqNo:	<b>3019525</b>
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD RPDLimit Qual

Sulfate ND 0.50

Sample ID	<b>LCS-R123903_SO4</b>	SampType:	<b>LCS</b>	TestCode:	<b>300_W_SO4P</b>	Units:	<b>mg/L</b>	Prep Date:		RunNo:	<b>123903</b>
Client ID:	<b>LCSW</b>	Batch ID:	<b>R123903</b>	TestNo:	<b>EPA 300.0</b>			Analysis Date:	<b>5/7/2018</b>	SeqNo:	<b>3019526</b>
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD RPDLimit Qual

Sulfate 3.887 0.50 4.000 0 97.2 90 110

Sample ID	<b>N030186-001BMS</b>	SampType:	<b>MS</b>	TestCode:	<b>300_W_SO4P</b>	Units:	<b>mg/L</b>	Prep Date:		RunNo:	<b>123903</b>
Client ID:	<b>ZZZZZZ</b>	Batch ID:	<b>R123903</b>	TestNo:	<b>EPA 300.0</b>			Analysis Date:	<b>5/7/2018</b>	SeqNo:	<b>3019533</b>
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD RPDLimit Qual

Sulfate 455.140 25 200.0 261.3 96.9 80 120

Sample ID	<b>N030186-001BMSP</b>	SampType:	<b>MSD</b>	TestCode:	<b>300_W_SO4P</b>	Units:	<b>mg/L</b>	Prep Date:		RunNo:	<b>123903</b>
Client ID:	<b>ZZZZZZ</b>	Batch ID:	<b>R123903</b>	TestNo:	<b>EPA 300.0</b>			Analysis Date:	<b>5/7/2018</b>	SeqNo:	<b>3019534</b>
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD RPDLimit Qual

Sulfate 455.950 25 200.0 261.3 97.3 80 120 455.1 0.178 20

Sample ID	<b>N030186-001BDUP</b>	SampType:	<b>DUP</b>	TestCode:	<b>300_W_SO4P</b>	Units:	<b>mg/L</b>	Prep Date:		RunNo:	<b>123903</b>
Client ID:	<b>ZZZZZZ</b>	Batch ID:	<b>R123903</b>	TestNo:	<b>EPA 300.0</b>			Analysis Date:	<b>5/7/2018</b>	SeqNo:	<b>3019538</b>
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD RPDLimit Qual

Sulfate 262.460 25 261.3 0.431 20

### Qualifiers:

- |    |   |   |                                      |   |  |
|----|---|---|--------------------------------------|---|--|
| B  | Analyte detected in the associated Method Blank | E | Value above quantitation range       | H | Holding times for preparation or analysis exceeded           |
| ND | Not Detected at the Reporting Limit             | R | RPD outside accepted recovery limits | S | Spike/Surrogate outside of limits due to matrix interference |
- Calculations are based on raw values



**ASSET LABORATORIES**  
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**ASSET Laboratories**
**ANALYTICAL RESULTS**
**Print Date:** 17-May-18

**CLIENT:** CH2M HILL  
**Lab Order:** N030121  
**Project:** PG&E Topock, 680375.03.IM.OP.00  
**Lab ID:** N030121-002

**Client Sample ID:** SC-700B-WDR-573  
**Collection Date:** 5/2/2018 1:33:00 PM  
**Matrix:** WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**NITRATE/NITRITE-N BY CADMIUM REDUCTION**
**SM4500-NO3F**

RunID: <b>NV00922-WC_180511E</b>	QC Batch: <b>R124008</b>			PrepDate			Analyst: <b>QBM</b>
Nitrate/Nitrite as N	2.9	0.16	0.25	mg/L	5		5/11/2018

**Qualifiers:** B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 S Spike/Surrogate outside of limits due to matrix interference  
 DO Surrogate Diluted Out  
 E Value above quantitation range  
 ND Not Detected at the Reporting Limit  
 Results are wet unless otherwise specified



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**CLIENT:** CH2M HILL  
**Work Order:** N030121  
**Project:** PG&E Topock, 680375.03.IM.OP.00

**ANALYTICAL QC SUMMARY REPORT****TestCode: 4500N03F\_W**

Sample ID	MB-R124008	SampType:	MBLK	TestCode:	4500N03F_W	Units:	mg/L	Prep Date:		RunNo:	124008		
Client ID:	PBW	Batch ID:	R124008	TestNo:	SM4500-NO3			Analysis Date:	5/11/2018	SeqNo:	3023825		
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate/Nitrite as N		ND		0.050									

Sample ID	LCS-R124008	SampType:	LCS	TestCode:	4500N03F_W	Units:	mg/L	Prep Date:		RunNo:	124008		
Client ID:	LCSW	Batch ID:	R124008	TestNo:	SM4500-NO3			Analysis Date:	5/11/2018	SeqNo:	3023826		
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate/Nitrite as N		0.555		0.050	0.5000	0	111	85	115				

Sample ID	N030096-001CDUP	SampType:	DUP	TestCode:	4500N03F_W	Units:	mg/L	Prep Date:		RunNo:	124008		
Client ID:	ZZZZZZ	Batch ID:	R124008	TestNo:	SM4500-NO3			Analysis Date:	5/11/2018	SeqNo:	3023828		
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate/Nitrite as N		3.520		0.25						3.684	4.55	20	

Sample ID	N030096-002CMS	SampType:	MS	TestCode:	4500N03F_W	Units:	mg/L	Prep Date:		RunNo:	124008		
Client ID:	ZZZZZZ	Batch ID:	R124008	TestNo:	SM4500-NO3			Analysis Date:	5/11/2018	SeqNo:	3023830		
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate/Nitrite as N		22.446		1.0	10.00	10.62	118	75	125				

Sample ID	N030096-002CMSD	SampType:	MSD	TestCode:	4500N03F_W	Units:	mg/L	Prep Date:		RunNo:	124008		
Client ID:	ZZZZZZ	Batch ID:	R124008	TestNo:	SM4500-NO3			Analysis Date:	5/11/2018	SeqNo:	3023831		
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate/Nitrite as N		20.726		1.0	10.00	10.62	101	75	125	22.45	7.97	20	

**Qualifiers:**

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference

Calculations are based on raw values


**ASSET LABORATORIES**  
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# SAMPLE RECEIVING ITEMS



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<b>Project Name</b> PG&E Topock <b>Location</b> PG&E Topock <b>Project Number</b> 680375.03.IM.OP.00 <b>Project Manager</b> Scott O'Donnell <b>Sample Manager</b> Shawn Duffy  <b>Task Order</b> <b>Project</b> IM3PLANT-ARAR-WDR-573 <b>Turnaround Time</b> 10 Days <b>Shipping Date:</b> <b>COC Number:</b> 573				<b>Container:</b> 1 Liter Poly 1 Liter Poly 1 Liter Poly 250 ml Poly 1 Liter Poly 1 Liter Poly 500 ml Poly 500 ml Poly 1 Liter Poly		<b>Preservatives:</b> 4°C Lab H2SO4 4°C 4°C 4°C 4°C Lab H2SO4 4°C 4°C 4°C 4°C		<b>Filtered:</b> NA NA NA NA NA NA NA NA NA		<b>Holding Time:</b> 28 7 7 1 28 7 180 180 7		AMMONIA (SM4500NH3D) Anions (E300.0) Fl. SO4 CONDUCTIVITY (E120.1) E218.6 Lab Filtered Nitrate/Nitrite (SM4500NO3-E) TDS (SM2540C) Total Metals(E200.7 and E200.8) Total Metals(E200.8) Cr & Mn Turbidity (SM2130)		Number of Containers	COMMENTS																				
<b>DATE</b> <b>TIME</b> <b>Matrix</b>																																			
SC-100B-WDR-573				5-2-18				1330				Water						X		X		X		X		X		N030121-01		3					
SC-700B-WDR-573				5-2-18				1333				Water				X		X		X		X		X		X		-02		4					
														TOTAL NUMBER OF CONTAINERS										7											

<b>Signatures</b> Approved by <i>[Signature]</i> Sampled by <i>[Signature]</i> Relinquished by <i>[Signature]</i> Received by <i>[Signature]</i> Relinquished by <i>[Signature]</i> Received by <i>[Signature]</i>		<b>Date/Time</b> 5-2-18 1330 5-2-18 1333 5-2-18 1605 5/2/18 16:05 5/2/18 19:15 5/2/17 19:15		<b>Shipping Details</b> Method of Shipment: <b>FedEx</b> On Ice: yes / no Airbill No: Lab Name: <b>ASSET Laboratories</b> Lab Phone: <b>(702) 307-2659</b>		<b>ATTN:</b> Sample Custody and Marlon Cartin		<b>Special Instructions:</b> SC-700B Total metals List: Cr,Al,Sb,As,Ba,B,Cu,Pb,Mn,Mo,Ni,Fe,Zn  Report Copy to Doug Scott (970) 731-0636	
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2.6°C (RH2)



## ASSET Laboratories

Please review the checklist below. Any NO signifies non-compliance. Any non-compliance will be noted and must be understood as having an impact on the quality of the data. All tests will be performed as requested regardless of any compliance issues.

If you have any questions or further instruction, please contact our Project Coordinator at (702) 307-2659.

Cooler Received/Opened On: 5/2/2018 Workorder: N030121  
 Rep sample Temp (Deg C): 2.6 IR Gun ID: 2  
 Temp Blank: ☒ Yes ☐ No  
 Carrier name: ASSET  
 Last 4 digits of Tracking No.: NA Packing Material Used: None  
 Cooling process: ☒ Ice ☐ Ice Pack ☐ Dry Ice ☐ Other ☐ None

### Sample Receipt Checklist

1. Shipping container/cooler in good condition?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
2. Custody seals intact, signed, dated on shipping container/cooler?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
3. Custody seals intact on sample bottles?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
4. Chain of custody present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
5. Sampler's name present in COC?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
6. Chain of custody signed when relinquished and received?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
7. Chain of custody agrees with sample labels?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
8. Samples in proper container/bottle?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
9. Sample containers intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
10. Sufficient sample volume for indicated test?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
11. All samples received within holding time?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
12. Temperature of rep sample or Temp Blank within acceptable limit?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	NA <input type="checkbox"/>
13. Water - VOA vials have zero headspace?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	NA <input checked="" type="checkbox"/>
14. Water - pH acceptable upon receipt? Example: pH > 12 for (CN,S); pH<2 for Metals	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	NA <input type="checkbox"/>
15. Did the bottle labels indicate correct preservatives used?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	NA <input checked="" type="checkbox"/>
16. Were there Non-Conformance issues at login?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	NA <input type="checkbox"/>
Was Client notified?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	NA <input checked="" type="checkbox"/>

Comments: Samples for Hex Cr were lab filtered and preserved with Ammonium buffer.  
 Samples for Metals were lab preserved with HN03 and for NH3/NO3 with H2SO4, pH adjusted to <2.

For:

Checklist Completed By: DA  5/9/2018

Reviewed By:  05/15/2018



## ASSET Laboratories

3151-3153 W Post Rd., Las Vegas, NV 89118

www.atl-labs.com

TEL: 7023072659

FAX: 7023072691

# CHAIN-OF-CUSTODY RECORD

Page 1 of 1

**QC Level: Level IV**

**Subcontractor:**

BC Labs  
4100 Atlas Court  
Bakersfield, CA 93308

TEL: (661) 327-4911  
FAX: (661) 327-1918  
Acct #:

Field Sampler: SIGNED

**03-May-18**


Sample ID	Matrix	Date Collected	Bottle Type	Requested Tests		
				SM4500-NH3D		
N030121-002A / SC-700B-WDR-573	Water	5/2/2018 1:33:00 PM	32OZP	1		

General Comments: Please email sample receipt acknowledgement to the PM.

Please use PO#:N30121A Please email Invoices and Account Receivable Statements to elvira@assetlaboratories.com. For questions, call Marlon at (702)-307-2659. Please e-mail results to reports.lv@assetlaboratories.com by: Normal TAT.

Please analyze for Ammonia by SM4500NH3D. EDD Requirement Labspec7 edata.

GSO #: 540457054

	<b>Date/Time</b>		<b>Date/Time</b>
Relinquished by: 	5/3/2018 17:00	Received by: _____	_____
Relinquished by: _____	_____	Received by: _____	_____

## List of Analysts

### ASSET Laboratories Work Order: N030121

NAME	TEST METHOD
Quennie Manimtim	SM 4500-NO3F
Claire Ignacio	EPA 200.7, EPA 200.8
Ria Abes	EPA 218.6, EPA 300.0
Lilia Ramit	EPA 120.1, SM 2540C, SM 2130B



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NEVADA  
3151 W. Post Rd., Las Vegas, NV 89118  
P: 702.307.2659 F: 702.307.2691

"Serving Clients with Passion and Professionalism"

May 03, 2018

Doug Scott  
CH2M HILL  
155 Grand Avenue, Suite 1000  
Oakland, CA 94612  
TEL: (970) 731-0636  
FAX: (510) 622-9129

Workorder No.: N030122

RE: PG&E Topock, 680375.03.IM.OP.00

Attention: Doug Scott

Enclosed are the results for sample(s) received on May 02, 2018 by ASSET Laboratories . The sample(s) are tested for the parameters as indicated in the enclosed chain of custody in accordance with the applicable laboratory certifications.

Thank you for the opportunity to service the needs of your company.

Please feel free to call me at (702) 307-2659 if I can be of further assistance to your company.

Sincerely,



Quennie Manimtim  
Laboratory Director

The cover letter is an integral part of this analytical report. This Laboratory Report cannot be reproduced in part or in its entirety without written permission from the client and Advanced Technology Laboratories - Las Vegas.



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---

**CLIENT:** CH2M HILL  
**Project:** PG&E Topock, 680375.03.IM.OP.00  
**Lab Order:** N030122

---

**CASE NARRATIVE****SAMPLE RECEIVING/GENERAL COMMENTS:**

All sample containers were received intact with proper chain of custody documentation.

Information on sample receipt conditions including discrepancies can be found in attached Sample Receipt Checklist Form.

Cooler temperature and sample preservation were verified upon receipt of samples if applicable.

Samples were analyzed past holding time. pH testing is specified to be performed in the field within 15 minutes of sampling; sample was received and analyzed past the regulatory holding time.



## ASSET Laboratories

Date: 03-May-18

**CLIENT:** CH2M HILL  
**Project:** PG&E Topock, 680375.03.IM.OP.00  
**Lab Order:** N030122  
**Contract No:** IM3PLANT-AR

### Work Order Sample Summary

Lab Sample ID	Client Sample ID	Matrix	Collection Date	Date Received	Date Reported
N030122-001A	SC-100B-WDR-573	Water	5/2/2018 1:30:00 PM	5/2/2018	5/3/2018
N030122-002A	SC-700B-WDR-573	Water	5/2/2018 1:33:00 PM	5/2/2018	5/3/2018



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ORELAP/NELAP Cert 4046

**ASSET Laboratories**
**ANALYTICAL RESULTS**
**Print Date:** 03-May-18

**CLIENT:** CH2M HILL  
**Lab Order:** N030122  
**Project:** PG&E Topock, 680375.03.IM.OP.00  
**Lab ID:** N030122-001

**Client Sample ID:** SC-100B-WDR-573  
**Collection Date:** 5/2/2018 1:30:00 PM  
**Matrix:** WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
----------	--------	-----	-----	------	-------	----	---------------

**PH**
**SM4500-H+B**

RunID: <b>NV00922-WC_180503B</b>	QC Batch: <b>R123804</b>			PrepDate		Analyst: <b>LR</b>
pH	7.2	0.10	0.10	H	pH Units	5/3/2018 11:05 AM
Temp. at time of pH Analysis	25	0.10	0.10	H	°C	5/3/2018 11:05 AM

**Qualifiers:** B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 S Spike/Surrogate outside of limits due to matrix interference  
 DO Surrogate Diluted Out  
 E Value above quantitation range  
 ND Not Detected at the Reporting Limit  
 Results are wet unless otherwise specified



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 ELAP Cert 2676 | NV Cert NV00922  
 ORELAP/NELAP Cert 4046

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**ASSET Laboratories**
**ANALYTICAL RESULTS**
**Print Date:** 03-May-18

**CLIENT:** CH2M HILL  
**Lab Order:** N030122  
**Project:** PG&E Topock, 680375.03.IM.OP.00  
**Lab ID:** N030122-002

**Client Sample ID:** SC-700B-WDR-573  
**Collection Date:** 5/2/2018 1:33:00 PM  
**Matrix:** WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
----------	--------	-----	-----	------	-------	----	---------------

**PH**
**SM4500-H+B**

RunID: <b>NV00922-WC_180503B</b>	QC Batch: <b>R123804</b>			PrepDate		Analyst: <b>LR</b>
pH	7.0	0.10	0.10	H	pH Units	5/3/2018 11:05 AM
Temp. at time of pH Analysis	25	0.10	0.10	H	°C	5/3/2018 11:05 AM

**Qualifiers:** B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 S Spike/Surrogate outside of limits due to matrix interference  
 DO Surrogate Diluted Out  
 E Value above quantitation range  
 ND Not Detected at the Reporting Limit  
 Results are wet unless otherwise specified



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**CLIENT:** CH2M HILL  
**Work Order:** N030122  
**Project:** PG&E Topock, 680375.03.IM.OP.00

**ANALYTICAL QC SUMMARY REPORT****TestCode: 150.1\_4500H+B\_W**

Sample ID	N030122-001ADUP	SampType:	DUP	TestCode:	150.1_4500H	Units:	pH Units	Prep Date:		RunNo:	123804		
Client ID:	ZZZZZZ	Batch ID:	R123804	TestNo:	SM4500-H+B			Analysis Date:	5/3/2018	SeqNo:	3014511		
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
pH		7.220		0.10						7.200	0.277	10	H
Temp. at time of pH Analysis		25.000		0.10						25.00	0	10	H

**Qualifiers:**

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

**ASSET LABORATORIES**

ANALYTICAL SERVICES IN PROCESS FOR ENVIRONMENTAL TECHNOLOGIES

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ORELAP/NELAP Cert 4046

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2.6°C R#2

## ASSET Laboratories

Please review the checklist below. Any NO signifies non-compliance. Any non-compliance will be noted and must be understood as having an impact on the quality of the data. All tests will be performed as requested regardless of any compliance issues.

If you have any questions or further instruction, please contact our Project Coordinator at (702) 307-2659.

Cooler Received/Opened On: 5/2/2018 Workorder: N030122  
 Rep sample Temp (Deg C): 2.6 IR Gun ID: 2  
 Temp Blank: ☒ Yes ☐ No  
 Carrier name: ASSET  
 Last 4 digits of Tracking No.: NA Packing Material Used: None  
 Cooling process: ☒ Ice ☐ Ice Pack ☐ Dry Ice ☐ Other ☐ None

### Sample Receipt Checklist

1. Shipping container/cooler in good condition?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
2. Custody seals intact, signed, dated on shipping container/cooler?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
3. Custody seals intact on sample bottles?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
4. Chain of custody present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
5. Sampler's name present in COC?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
6. Chain of custody signed when relinquished and received?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
7. Chain of custody agrees with sample labels?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
8. Samples in proper container/bottle?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
9. Sample containers intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
10. Sufficient sample volume for indicated test?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
11. All samples received within holding time?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
12. Temperature of rep sample or Temp Blank within acceptable limit?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	NA <input type="checkbox"/>
13. Water - VOA vials have zero headspace?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	NA <input checked="" type="checkbox"/>
14. Water - pH acceptable upon receipt? Example: pH > 12 for (CN,S); pH<2 for Metals	Yes <input type="checkbox"/>	No <input type="checkbox"/>	NA <input checked="" type="checkbox"/>
15. Did the bottle labels indicate correct preservatives used?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	NA <input checked="" type="checkbox"/>
16. Were there Non-Conformance issues at login?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	NA <input type="checkbox"/>
Was Client notified?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	NA <input checked="" type="checkbox"/>

Comments: Samples for pH were past holding time upon receipt.

For:

Checklist Completed By: DA  5/3/2018

Reviewed By:  05/03/2018

## List of Analysts

### ASSET Laboratories Work Order: N030122

NAME	TEST METHOD
Lilia Ramit	SM 4500-H+B



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Environmental Testing Laboratory Since 1949



Date of Report: 06/14/2018

Marlon Cartin

ASSET Laboratories

3151-3153 W. Post Rd  
Las Vegas, NV 89118

Client Project: [none]  
BCL Project: Level IV  
BCL Work Order: 1818032  
Invoice ID: B306893

Enclosed are the results of analyses for samples received by the laboratory on 6/7/2018. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Contact Person: Vanessa Sandoval  
Client Service Rep

Stuart Buttram  
Technical Director

Certifications: CA ELAP #1186; NV #CA00014; OR ELAP #4032-001; AK UST101

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Chain of Custody and Cooler Receipt Form for 1818032 Page 1 of 2

**CHAIN-OF-CUSTODY RECORD**  
18-18032

Page 1 of 1



**ASSET Laboratories**

3151-3153 W Post Rd., Las Vegas, NV 89118

www.elt-labs.com

TEL: 7023072659

FAX: 7023072691

Subcontractor:

BC Labs

4100 Atlas Court

Bakersfield, CA 93308

TEL: (661) 327-4911

FAX: (661) 327-1918

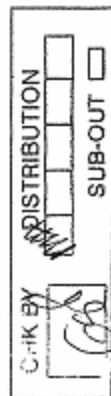
Acct #:

QC Level: Level IV

Field Sampler: SIGNED

06-Jun-18

Sample ID	Matrix	Date Collected	Bottle Type	Requested Tests
N030645-002A / SC-700B-WDR-574	Water	6/5/2018 2:52:00 PM	3202P	SM4500-NH3D 1



General Comments:

Please email sample receipt acknowledgement to the PM.

Please use PO# N30645/A. Please email invoices and Account Receivable Statements to [skira@assetlaboratories.com](mailto:skira@assetlaboratories.com). For questions, call Marion at (702)-307-2659. Please e-mail results to [reports.l@assetlaboratories.com](mailto:reports.l@assetlaboratories.com) by Normal TAT.

Please analyze for Ammonia by SM4500NH3D. EDO Requirement Labspec7 edata.

Relinquished by:	Date/Time	Relinquished by:	Date/Time
	6/6/2018 17:00		6.7.18 10:30
Relinquished by:		Received by:	
		Received by:	

GSO #: 540858618



**Laboratories, Inc.**

Environmental Testing Laboratory Since 1949

Chain of Custody and Cooler Receipt Form for 1818032 Page 2 of 2

BC LABORATORIES INC.		COOLER RECEIPT FORM		Page 1 Of 1							
Submission #: 18-18032											
<b>SHIPPING INFORMATION</b>		<b>SHIPPING CONTAINER</b>		<b>FREE LIQUID</b>							
Fed Ex <input type="checkbox"/> UPS <input type="checkbox"/> Ontrac <input type="checkbox"/> Hand Delivery <input type="checkbox"/>		Ice Chest <input checked="" type="checkbox"/> None <input type="checkbox"/> Box <input type="checkbox"/>		YES <input type="checkbox"/> NO <input type="checkbox"/>							
BC Lab Field Service <input type="checkbox"/> Other (Specify) <u>ASO</u>		Other <input type="checkbox"/> (Specify) _____		W / S							
Refrigerant: Ice <input checked="" type="checkbox"/> Blue Ice <input type="checkbox"/> None <input type="checkbox"/> Other <input type="checkbox"/> Comments: _____											
Custody Seals: Ice Chest <input type="checkbox"/> Containers <input type="checkbox"/> None <input checked="" type="checkbox"/> Comments: _____											
All samples received? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> All samples containers intact? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Description(s) match COC? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>											
COC Received YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>		Emissivity: <u>0.7</u> Container: <u>phx</u> Thermometer ID: <u>274</u>		Date/Time: <u>6-7-18</u>							
		Temperature: (A) <u>0.0</u> °C / (C) <u>0.8</u> °C		Analyst Init: <u>JD</u> 10:30							
<b>SAMPLE CONTAINERS</b>		<b>SAMPLE NUMBERS</b>									
		1	2	3	4	5	6	7	8	9	10
QT PE UNPRES											
4oz / 8oz / 16oz PE UNPRES											
2oz Cr <sup>6</sup>											
QT INORGANIC CHEMICAL METALS											
INORGANIC CHEMICAL METALS 4oz / 8oz / 16oz											
PT CYANIDE											
PT NITROGEN FORMS		A									
PT TOTAL SULFIDE											
2oz NITRATE / NITRITE											
PT TOTAL ORGANIC CARBON											
PT CHEMICAL OXYGEN DEMAND											
PIA PHENOLICS											
40ml VOA VIAL TRAVEL BLANK											
40ml VOA VIAL											
QT EPA 1664											
PT ODOR											
RADIOLOGICAL											
BACTERIOLOGICAL											
40 ml VOA VIAL- 504											
QT EPA 508/608/808/90											
QT EPA 515.1/5150											
QT EPA 525											
QT EPA 525 TRAVEL BLANK											
40ml EPA 547											
40ml EPA 531.1											
8oz EPA 548											
QT EPA 549											
QT EPA 8015M											
QT EPA 8270											
8oz / 16oz / 32oz AMBER											
8oz / 16oz / 32oz JAR											
SOIL SLERVE											
PCB VIAL											
PLASTIC BAG											
TEDLAR BAG											
FERROUS IRON											
ENCORE											
SMART KIT											
SUMMA CANISTER											

Comments:

Sample Numbering Completed By: \_\_\_\_\_

A = Actual / C = Corrected

Date/Time: 6/7/18 1753

Rev 21 05/23/2016

(S:\WPDec\Wend\Perfor\LAB\_DSCS\FORMS\ISAMREC\rev 20)

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3151-3153 W. Post Rd  
Las Vegas, NV 89118

**Reported:** 06/14/2018 12:08  
**Project:** Level IV  
**Project Number:** [none]  
**Project Manager:** Marlon Cartin

## Laboratory / Client Sample Cross Reference

Laboratory	Client Sample Information			
1818032-01	<b>COC Number:</b>	---	<b>Receive Date:</b>	06/07/2018 10:30
	<b>Project Number:</b>	---	<b>Sampling Date:</b>	06/05/2018 14:52
	<b>Sampling Location:</b>	---	<b>Sample Depth:</b>	---
	<b>Sampling Point:</b>	N030645-002A / SC-700B-WDR-574	<b>Lab Matrix:</b>	Water
	<b>Sampled By:</b>	Client	<b>Sample Type:</b>	Water





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3151-3153 W. Post Rd  
Las Vegas, NV 89118

**Reported:** 06/14/2018 12:08  
**Project:** Level IV  
**Project Number:** [none]  
**Project Manager:** Marlon Cartin

## Water Analysis (General Chemistry)

<b>BCL Sample ID:</b>	1818032-01	<b>Client Sample Name:</b>	N030645-002A / SC-700B-WDR-574, 6/5/2018 2:52:00PM, Client					
<b>Constituent</b>	<b>Result</b>	<b>Units</b>	<b>PQL</b>	<b>MDL</b>	<b>Method</b>	<b>MB Bias</b>	<b>Lab Quals</b>	<b>Run #</b>
Ammonia as N (Distilled)	ND	mg/L	0.20		SM-4500-NH3G	ND		1

<b>Run #</b>	<b>Method</b>	<b>Prep Date</b>	<b>Run Date/Time</b>	<b>Analyst</b>	<b>Instrument</b>	<b>Dilution</b>	<b>QC Batch ID</b>
1	SM-4500-NH3G	06/13/18 08:05	06/13/18 16:52	JMH	SC-1	1	B016462

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Las Vegas, NV 89118

**Reported:** 06/14/2018 12:08  
**Project:** Level IV  
**Project Number:** [none]  
**Project Manager:** Marlon Cartin

## Water Analysis (General Chemistry)

### Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
<b>QC Batch ID: B016462</b>						
Ammonia as N (Distilled)	B016462-BLK1	ND	mg/L	0.20		

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Las Vegas, NV 89118

**Reported:** 06/14/2018 12:08  
**Project:** Level IV  
**Project Number:** [none]  
**Project Manager:** Marlon Cartin

## Water Analysis (General Chemistry)

### Quality Control Report - Laboratory Control Sample

								<u>Control Limits</u>		
Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Percent	RPD	Lab
								Recovery		Quals
QC Batch ID: B016462										
Ammonia as N (Distilled)	B016462-BS1	LCS	0.97180	1.0000	mg/L	97.2		85 - 115		

*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*

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ASSET Laboratories  
3151-3153 W. Post Rd  
Las Vegas, NV 89118

**Reported:** 06/14/2018 12:08  
**Project:** Level IV  
**Project Number:** [none]  
**Project Manager:** Marlon Cartin

## Water Analysis (General Chemistry)

### Quality Control Report - Precision & Accuracy

									Control Limits		
Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	RPD	Percent Recovery	Lab Quals
QC Batch ID: B016462		Used client sample: N									
Ammonia as N (Distilled)	DUP	1817953-03	0.61480	0.53820		mg/L	13.3		20		
	MS	1817953-03	0.61480	1.6359	1.0000	mg/L		102		80 - 120	
	MSD	1817953-03	0.61480	1.5295	1.0000	mg/L	6.7	91.5	20	80 - 120	

June 19, 2018

Doug Scott  
CH2M HILL  
155 Grand Avenue, Suite 1000  
Oakland, CA 94612  
TEL: (970) 731-0636  
FAX: (510) 622-9129

Workorder No.: N030645

RE: PG&E Topock, 680375.03.IM.OP.00

Attention: Doug Scott

Enclosed are the results for sample(s) received on June 05, 2018 by ASSET Laboratories . The sample(s) are tested for the parameters as indicated in the enclosed chain of custody in accordance with the applicable laboratory certifications.

Thank you for the opportunity to service the needs of your company.

Please feel free to call me at (702) 307-2659 if I can be of further assistance to your company.

Sincerely,



Quennie Manimtim  
Laboratory Director

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**CLIENT:** CH2M HILL  
**Project:** PG&E Topock, 680375.03.IM.OP.00  
**Lab Order:** N030645

**CASE NARRATIVE****SAMPLE RECEIVING/GENERAL COMMENTS:**

All sample containers were received intact with proper chain of custody documentation.

Information on sample receipt conditions including discrepancies can be found in attached Sample Receipt Checklist Form.

Cooler temperature and sample preservation were verified upon receipt of samples if applicable.

Samples were analyzed within method holding time.

**Subcontracted Analyses:**

Ammonia was subcontracted to BC Labs- Bakersfield,CA.

**Analytical Comments for EPA 200.7:**

Matrix Spike (MS) is outside recovery criteria for Iron in QC sample N030627-001C-MS1 possibly due to matrix interference. The associated Laboratory Control Sample (LCS) recovery was acceptable.

**Analytical Comments for EPA 200.8:**

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) are outside recovery criteria for some analytes in QC samples N030627-001C-MS, N030627-001C-MSD and N030646-006C-MS possibly due to matrix interference. The associated Laboratory Control Sample (LCS) recovery was acceptable.



**ASSET Laboratories**

Date: 19-Jun-18

**CLIENT:** CH2M HILL  
**Project:** PG&E Topock, 680375.03.IM.OP.00  
**Lab Order:** N030645  
**Contract No:** IM3PLANT-AR

**Work Order Sample Summary**

Lab Sample ID	Client Sample ID	Matrix	Collection Date	Date Received	Date Reported
N030645-001A	SC-100B-WDR-574	Water	6/5/2018 2:38:00 PM	6/5/2018	6/19/2018
N030645-001B	SC-100B-WDR-574	Water	6/5/2018 2:38:00 PM	6/5/2018	6/19/2018
N030645-001C	SC-100B-WDR-574	Water	6/5/2018 2:38:00 PM	6/5/2018	6/19/2018
N030645-002A	SC-700B-WDR-574	Water	6/5/2018 2:52:00 PM	6/5/2018	6/19/2018
N030645-002B	SC-700B-WDR-574	Water	6/5/2018 2:52:00 PM	6/5/2018	6/19/2018
N030645-002C	SC-700B-WDR-574	Water	6/5/2018 2:52:00 PM	6/5/2018	6/19/2018
N030645-002D	SC-700B-WDR-574	Water	6/5/2018 2:52:00 PM	6/5/2018	6/19/2018
N030645-002E	SC-700B-WDR-574	Water	6/5/2018 2:52:00 PM	6/5/2018	6/19/2018



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# ASSET Laboratories

# ANALYTICAL RESULTS

Print Date: 19-Jun-18

CLIENT: CH2M HILL  
Lab Order: N030645  
Project: PG&E Topock, 680375.03.IM.OP.00  
Lab ID: N030645-001

Client Sample ID: SC-100B-WDR-574  
Collection Date: 6/5/2018 2:38:00 PM  
Matrix: WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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## SPECIFIC CONDUCTANCE

## EPA 120.1

RunID: NV00922-WC_180606A	QC Batch: R124491	PrepDate	Analyst: LR
Specific Conductance	7100 0.10 0.10	umhos/cm	1 6/6/2018 10:45 AM

Qualifiers: B Analyte detected in the associated Method Blank  
H Holding times for preparation or analysis exceeded  
S Spike/Surrogate outside of limits due to matrix interference  
DO Surrogate Diluted Out  
E Value above quantitation range  
ND Not Detected at the Reporting Limit  
Results are wet unless otherwise specified



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**ASSET Laboratories****ANALYTICAL RESULTS**

Print Date: 19-Jun-18

**CLIENT:** CH2M HILL  
**Lab Order:** N030645  
**Project:** PG&E Topock, 680375.03.IM.OP.00  
**Lab ID:** N030645-002

**Client Sample ID:** SC-700B-WDR-574  
**Collection Date:** 6/5/2018 2:52:00 PM  
**Matrix:** WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**SPECIFIC CONDUCTANCE****EPA 120.1**

RunID: <b>NV00922-WC_180606A</b>	QC Batch: <b>R124491</b>			PrepDate			Analyst: <b>LR</b>
Specific Conductance	7000	0.10	0.10	umhos/cm	1		6/6/2018 10:45 AM

<b>Qualifiers:</b>	B	Analyte detected in the associated Method Blank	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
	DO	Surrogate Diluted Out		



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**CLIENT:** CH2M HILL  
**Work Order:** N030645  
**Project:** PG&E Topock, 680375.03.IM.OP.00

**ANALYTICAL QC SUMMARY REPORT****TestCode: 120.1\_WPGE**

Sample ID	N030646-004DDUP	SampType:	DUP	TestCode:	120.1_WPGE	Units:	umhos/cm	Prep Date:		RunNo:	124491		
Client ID:	ZZZZZZ	Batch ID:	R124491	TestNo:	EPA 120.1			Analysis Date:	6/6/2018	SeqNo:	3046003		
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Specific Conductance		7590.000		0.10						7600	0.132		2

Sample ID	N030646-009DDUP	SampType:	DUP	TestCode:	120.1_WPGE	Units:	umhos/cm	Prep Date:		RunNo:	124491		
Client ID:	ZZZZZZ	Batch ID:	R124491	TestNo:	EPA 120.1			Analysis Date:	6/6/2018	SeqNo:	3046009		
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Specific Conductance		6970.000		0.10						6990	0.287		2

**Qualifiers:**

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference

Calculations are based on raw values



**ASSET LABORATORIES**  
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**ASSET Laboratories**
**ANALYTICAL RESULTS**
**Print Date:** 19-Jun-18

**CLIENT:** CH2M HILL  
**Lab Order:** N030645  
**Project:** PG&E Topock, 680375.03.IM.OP.00  
**Lab ID:** N030645-001

**Client Sample ID:** SC-100B-WDR-574  
**Collection Date:** 6/5/2018 2:38:00 PM  
**Matrix:** WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**TOTAL FILTERABLE RESIDUE**
**SM2540C**

RunID: <b>NV00922-WC_180607D</b>	QC Batch: <b>68365</b>			PrepDate	<b>6/7/2018</b>	Analyst: <b>LR</b>
Total Dissolved Solids (Residue, Filterable)	4100	50	50	mg/L	1	6/7/2018 01:14 PM

**Qualifiers:** B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 S Spike/Surrogate outside of limits due to matrix interference  
 DO Surrogate Diluted Out  
 E Value above quantitation range  
 ND Not Detected at the Reporting Limit  
 Results are wet unless otherwise specified



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**ASSET Laboratories**
**ANALYTICAL RESULTS**
**Print Date:** 19-Jun-18

**CLIENT:** CH2M HILL  
**Lab Order:** N030645  
**Project:** PG&E Topock, 680375.03.IM.OP.00  
**Lab ID:** N030645-002

**Client Sample ID:** SC-700B-WDR-574  
**Collection Date:** 6/5/2018 2:52:00 PM  
**Matrix:** WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**TOTAL FILTERABLE RESIDUE**
**SM2540C**

RunID: <b>NV00922-WC_180607D</b>	QC Batch: <b>68365</b>			PrepDate	<b>6/7/2018</b>	Analyst: <b>LR</b>
Total Dissolved Solids (Residue, Filterable)	4100	50	50	mg/L	1	6/7/2018 01:14 PM

**Qualifiers:** B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 S Spike/Surrogate outside of limits due to matrix interference  
 DO Surrogate Diluted Out  
 E Value above quantitation range  
 ND Not Detected at the Reporting Limit  
 Results are wet unless otherwise specified



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**CLIENT:** CH2M HILL  
**Work Order:** N030645  
**Project:** PG&E Topock, 680375.03.IM.OP.00

**ANALYTICAL QC SUMMARY REPORT****TestCode: 160.1\_2540C\_W**

Sample ID <b>LCS-68365</b>	SampType: <b>LCS</b>	TestCode: <b>160.1_2540C</b>	Units: <b>mg/L</b>	Prep Date: <b>6/7/2018</b>	RunNo: <b>124532</b>
Client ID: <b>LCSW</b>	Batch ID: <b>68365</b>	TestNo: <b>SM2540C</b>		Analysis Date: <b>6/7/2018</b>	SeqNo: <b>3048169</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual
Total Dissolved Solids (Residue, Filtera	984.000	10	1000	0	98.4 80 120

Sample ID <b>MB-68365</b>	SampType: <b>MBLK</b>	TestCode: <b>160.1_2540C</b>	Units: <b>mg/L</b>	Prep Date: <b>6/7/2018</b>	RunNo: <b>124532</b>
Client ID: <b>PBW</b>	Batch ID: <b>68365</b>	TestNo: <b>SM2540C</b>		Analysis Date: <b>6/7/2018</b>	SeqNo: <b>3048170</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual
Total Dissolved Solids (Residue, Filtera	ND	10			

Sample ID <b>N030645-001ADUP</b>	SampType: <b>DUP</b>	TestCode: <b>160.1_2540C</b>	Units: <b>mg/L</b>	Prep Date: <b>6/7/2018</b>	RunNo: <b>124532</b>
Client ID: <b>ZZZZZZ</b>	Batch ID: <b>68365</b>	TestNo: <b>SM2540C</b>		Analysis Date: <b>6/7/2018</b>	SeqNo: <b>3048172</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual
Total Dissolved Solids (Residue, Filtera	4240.000	50			4075 3.97 5

**Qualifiers:**

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference

Calculations are based on raw values

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**ASSET Laboratories**
**ANALYTICAL RESULTS**
**Print Date:** 19-Jun-18

**CLIENT:** CH2M HILL  
**Lab Order:** N030645  
**Project:** PG&E Topock, 680375.03.IM.OP.00  
**Lab ID:** N030645-002

**Client Sample ID:** SC-700B-WDR-574  
**Collection Date:** 6/5/2018 2:52:00 PM  
**Matrix:** WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**TOTAL METALS BY ICP**
**EPA 200.7**

RunID: NV00922-ICP2_180618A	QC Batch: 68333	PrepDate	6/6/2018	Analyst: CEI
Aluminum	ND 40	50	µg/L	1 6/18/2018 10:11 AM
Boron	990 74	100	µg/L	1 6/17/2018 08:08 PM
Iron	ND 18	20	µg/L	1 6/17/2018 08:08 PM

**Qualifiers:** B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 S Spike/Surrogate outside of limits due to matrix interference  
 DO Surrogate Diluted Out  
 E Value above quantitation range  
 ND Not Detected at the Reporting Limit  
 Results are wet unless otherwise specified



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**CLIENT:** CH2M HILL  
**Work Order:** N030645  
**Project:** PG&E Topock, 680375.03.IM.OP.00

**ANALYTICAL QC SUMMARY REPORT****TestCode: 200.7\_WPGEPBP**

Sample ID <b>MB-68333</b>	SampType: <b>MBLK</b>	TestCode: <b>200.7_WPGE</b>	Units: <b>µg/L</b>	Prep Date: <b>6/6/2018</b>	RunNo: <b>124692</b>
Client ID: <b>PBW</b>	Batch ID: <b>68333</b>	TestNo: <b>EPA 200.7</b>		Analysis Date: <b>6/17/2018</b>	SeqNo: <b>3056587</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Boron	ND	100			
Iron	ND	20			

Sample ID <b>LCS1-68333</b>	SampType: <b>LCS</b>	TestCode: <b>200.7_WPGE</b>	Units: <b>µg/L</b>	Prep Date: <b>6/6/2018</b>	RunNo: <b>124692</b>
Client ID: <b>LCSW</b>	Batch ID: <b>68333</b>	TestNo: <b>EPA 200.7</b>		Analysis Date: <b>6/17/2018</b>	SeqNo: <b>3056588</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Boron	5023.581	100	5000	0	100 85 115
Iron	113.252	20	100.0	0	113 85 115

Sample ID <b>N030627-001C-MS1</b>	SampType: <b>MS</b>	TestCode: <b>200.7_WPGE</b>	Units: <b>µg/L</b>	Prep Date: <b>6/6/2018</b>	RunNo: <b>124692</b>
Client ID: <b>ZZZZZZ</b>	Batch ID: <b>68333</b>	TestNo: <b>EPA 200.7</b>		Analysis Date: <b>6/17/2018</b>	SeqNo: <b>3056590</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Boron	5909.932	100	5000	1008	98.0 75 125
Iron	115.650	20	100.0	76.58	39.1 75 125 S

Sample ID <b>N030646-001C-MS1</b>	SampType: <b>MS</b>	TestCode: <b>200.7_WPGE</b>	Units: <b>µg/L</b>	Prep Date: <b>6/6/2018</b>	RunNo: <b>124692</b>
Client ID: <b>ZZZZZZ</b>	Batch ID: <b>68333</b>	TestNo: <b>EPA 200.7</b>		Analysis Date: <b>6/17/2018</b>	SeqNo: <b>3056600</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Boron	5812.583	100	5000	1024	95.8 75 125
Iron	100.909	20	100.0	0	101 75 125

Sample ID <b>N030646-001C-MSD</b>	SampType: <b>MSD</b>	TestCode: <b>200.7_WPGE</b>	Units: <b>µg/L</b>	Prep Date: <b>6/6/2018</b>	RunNo: <b>124692</b>
Client ID: <b>ZZZZZZ</b>	Batch ID: <b>68333</b>	TestNo: <b>EPA 200.7</b>		Analysis Date: <b>6/17/2018</b>	SeqNo: <b>3056601</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

**Qualifiers:**

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference

Calculations are based on raw values



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**CLIENT:** CH2M HILL  
**Work Order:** N030645  
**Project:** PG&E Topock, 680375.03.IM.OP.00

## ANALYTICAL QC SUMMARY REPORT

**TestCode: 200.7\_WPGEPBB**

Sample ID	<b>N030646-001C-MSD</b>	SampType:	<b>MSD</b>	TestCode:	<b>200.7_WPGE</b>	Units:	<b>µg/L</b>	Prep Date:	<b>6/6/2018</b>	RunNo:	<b>124692</b>
Client ID:	<b>ZZZZZZ</b>	Batch ID:	<b>68333</b>	TestNo:	<b>EPA 200.7</b>			Analysis Date:	<b>6/17/2018</b>	SeqNo:	<b>3056601</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	5671.545	100	5000	1024	92.9	75	125	5813	2.46	20	
Iron	98.304	20	100.0	0	98.3	75	125	100.9	2.62	20	

Sample ID	<b>MB-68333</b>	SampType:	<b>MBLK</b>	TestCode:	<b>200.7_WPGE</b>	Units:	<b>µg/L</b>	Prep Date:	<b>6/6/2018</b>	RunNo:	<b>124694</b>
Client ID:	<b>PBW</b>	Batch ID:	<b>68333</b>	TestNo:	<b>EPA 200.7</b>			Analysis Date:	<b>6/18/2018</b>	SeqNo:	<b>3056719</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	ND	50									

Sample ID	<b>LCS1-68333</b>	SampType:	<b>LCS</b>	TestCode:	<b>200.7_WPGE</b>	Units:	<b>µg/L</b>	Prep Date:	<b>6/6/2018</b>	RunNo:	<b>124694</b>
Client ID:	<b>LCSW</b>	Batch ID:	<b>68333</b>	TestNo:	<b>EPA 200.7</b>			Analysis Date:	<b>6/18/2018</b>	SeqNo:	<b>3056720</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	10468.855	50	10000	0	105	85	115				

Sample ID	<b>N030627-001C-MS1</b>	SampType:	<b>MS</b>	TestCode:	<b>200.7_WPGE</b>	Units:	<b>µg/L</b>	Prep Date:	<b>6/6/2018</b>	RunNo:	<b>124694</b>
Client ID:	<b>ZZZZZZ</b>	Batch ID:	<b>68333</b>	TestNo:	<b>EPA 200.7</b>			Analysis Date:	<b>6/18/2018</b>	SeqNo:	<b>3056722</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	10399.752	50	10000	0	104	75	125				

Sample ID	<b>N030646-001C-MS1</b>	SampType:	<b>MS</b>	TestCode:	<b>200.7_WPGE</b>	Units:	<b>µg/L</b>	Prep Date:	<b>6/6/2018</b>	RunNo:	<b>124694</b>
Client ID:	<b>ZZZZZZ</b>	Batch ID:	<b>68333</b>	TestNo:	<b>EPA 200.7</b>			Analysis Date:	<b>6/18/2018</b>	SeqNo:	<b>3056732</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	10566.540	50	10000	0	106	75	125				

### Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference

Calculations are based on raw values



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ELAP Cert 2676 | NV Cert NV00922  
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**CLIENT:** CH2M HILL  
**Work Order:** N030645  
**Project:** PG&E Topock, 680375.03.IM.OP.00

## ANALYTICAL QC SUMMARY REPORT

**TestCode: 200.7\_WPGEPPB**

Sample ID	N030646-001C-MSD	SampType: MSD	TestCode: 200.7_WPGE	Units: µg/L	Prep Date: 6/6/2018	RunNo: 124694					
Client ID: ZZZZZZ	Batch ID: 68333	TestNo: EPA 200.7	Analysis Date: 6/18/2018	SeqNo: 3056733							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	10275.184	50	10000	0	103	75	125	10570	2.80	20	

### Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference

Calculations are based on raw values



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**ASSET Laboratories**
**ANALYTICAL RESULTS**
**Print Date:** 19-Jun-18

**CLIENT:** CH2M HILL  
**Lab Order:** N030645  
**Project:** PG&E Topock, 680375.03.IM.OP.00  
**Lab ID:** N030645-001

**Client Sample ID:** SC-100B-WDR-574  
**Collection Date:** 6/5/2018 2:38:00 PM  
**Matrix:** WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**TOTAL METALS BY ICPMS**
**EPA 200.8**

RunID: <b>NV00922-ICP7_180607C</b>	QC Batch: <b>68342</b>			PrepDate	<b>6/6/2018</b>	Analyst: <b>CEI</b>
Manganese	6.9	0.26	0.50	µg/L	1	6/7/2018 07:23 PM

**Qualifiers:** B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 S Spike/Surrogate outside of limits due to matrix interference  
 DO Surrogate Diluted Out  
 E Value above quantitation range  
 ND Not Detected at the Reporting Limit  
 Results are wet unless otherwise specified



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**ASSET Laboratories**
**ANALYTICAL RESULTS**
**Print Date:** 19-Jun-18

**CLIENT:** CH2M HILL  
**Lab Order:** N030645  
**Project:** PG&E Topock, 680375.03.IM.OP.00  
**Lab ID:** N030645-002

**Client Sample ID:** SC-700B-WDR-574  
**Collection Date:** 6/5/2018 2:52:00 PM  
**Matrix:** WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**TOTAL METALS BY ICPMS**
**EPA 200.8**

RunID: NV00922-ICP7_180607C	QC Batch: 68342	PrepDate	6/6/2018	Analyst: CEI		
Antimony	ND	0.16	0.50	µg/L	1	6/7/2018 07:45 PM
Arsenic	ND	0.081	0.10	µg/L	1	6/7/2018 07:45 PM
Barium	16	0.15	1.0	µg/L	1	6/7/2018 07:45 PM
Copper	ND	0.55	1.0	µg/L	1	6/7/2018 07:45 PM
Lead	ND	0.13	1.0	µg/L	1	6/7/2018 07:45 PM
Manganese	9.6	0.26	0.50	µg/L	1	6/7/2018 07:45 PM
Molybdenum	22	0.21	0.50	µg/L	1	6/7/2018 07:45 PM
Nickel	1.1	0.26	1.0	µg/L	1	6/7/2018 07:45 PM
Zinc	ND	2.3	10	µg/L	1	6/7/2018 07:45 PM

**Qualifiers:** B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 S Spike/Surrogate outside of limits due to matrix interference  
 DO Surrogate Diluted Out  
 E Value above quantitation range  
 ND Not Detected at the Reporting Limit  
 Results are wet unless otherwise specified



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**CLIENT:** CH2M HILL  
**Work Order:** N030645  
**Project:** PG&E Topock, 680375.03.IM.OP.00

**ANALYTICAL QC SUMMARY REPORT****TestCode: 200.8\_W**

Sample ID	MB-68342	SampType:	MBLK	TestCode:	200.8_W	Units:	µg/L	Prep Date:	6/6/2018	RunNo:	124541		
Client ID:	PBW	Batch ID:	68342	TestNo:	EPA 200.8			Analysis Date:	6/7/2018	SeqNo:	3048781		
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Antimony	ND	0.50									
Arsenic	ND	0.10									
Barium	0.226	1.0									
Copper	ND	1.0									
Lead	ND	1.0									
Manganese	ND	0.50									
Molybdenum	ND	0.50									
Nickel	ND	1.0									
Zinc	ND	10									

Sample ID	N030627-001C-MS	SampType:	MS	TestCode:	200.8_W	Units:	µg/L	Prep Date:	6/6/2018	RunNo:	124541		
Client ID:	ZZZZZZ	Batch ID:	68342	TestNo:	EPA 200.8			Analysis Date:	6/7/2018	SeqNo:	3048788		
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Antimony	10.267	0.50	10.00	0	103	75	125				
Arsenic	12.075	0.10	10.00	1.080	110	75	125				
Barium	33.615	1.0	10.00	22.83	108	75	125				
Copper	5.744	1.0	10.00	0	57.4	75	125				S
Manganese	99.792	0.50	100.0	0.7378	99.1	75	125				
Molybdenum	32.172	0.50	10.00	20.38	118	75	125				
Nickel	9.838	1.0	10.00	0	98.4	75	125				
Zinc	109.470	10	100.0	0	109	75	125				

Sample ID	N030627-001C-MS	SampType:	MS	TestCode:	200.8_W	Units:	µg/L	Prep Date:	6/6/2018	RunNo:	124541		
Client ID:	ZZZZZZ	Batch ID:	68342	TestNo:	EPA 200.8			Analysis Date:	6/7/2018	SeqNo:	3048789		
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Lead	11.104	5.0	10.00	0	111	75	125				
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**Qualifiers:**

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference

Calculations are based on raw values



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**CLIENT:** CH2M HILL  
**Work Order:** N030645  
**Project:** PG&E Topock, 680375.03.IM.OP.00

## ANALYTICAL QC SUMMARY REPORT

**TestCode:** 200.8\_W

Sample ID	<b>N030627-001C-MSD</b>	SampType:	<b>MSD</b>	TestCode:	<b>200.8_W</b>	Units:	<b>µg/L</b>	Prep Date:	<b>6/6/2018</b>	RunNo:	<b>124541</b>
Client ID:	<b>ZZZZZZ</b>	Batch ID:	<b>68342</b>	TestNo:	<b>EPA 200.8</b>			Analysis Date:	<b>6/7/2018</b>	SeqNo:	<b>3048790</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	10.252	0.50	10.00	0	103	75	125	10.27	0.143	20	
Arsenic	12.148	0.10	10.00	1.080	111	75	125	12.08	0.604	20	
Barium	33.781	1.0	10.00	22.83	109	75	125	33.62	0.493	20	
Copper	5.642	1.0	10.00	0	56.4	75	125	5.744	1.78	20	S
Manganese	98.699	0.50	100.0	0.7378	98.0	75	125	99.79	1.10	20	
Molybdenum	32.059	0.50	10.00	20.38	117	75	125	32.17	0.351	20	
Nickel	9.752	1.0	10.00	0	97.5	75	125	9.838	0.880	20	
Zinc	109.393	10	100.0	0	109	75	125	109.5	0.0703	20	

Sample ID	<b>N030627-001C-MSD</b>	SampType:	<b>MSD</b>	TestCode:	<b>200.8_W</b>	Units:	<b>µg/L</b>	Prep Date:	<b>6/6/2018</b>	RunNo:	<b>124541</b>
Client ID:	<b>ZZZZZZ</b>	Batch ID:	<b>68342</b>	TestNo:	<b>EPA 200.8</b>			Analysis Date:	<b>6/7/2018</b>	SeqNo:	<b>3048793</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	10.878	5.0	10.00	0	109	75	125	11.10	2.05	20	

Sample ID	<b>N030646-006C-MS</b>	SampType:	<b>MS</b>	TestCode:	<b>200.8_W</b>	Units:	<b>µg/L</b>	Prep Date:	<b>6/6/2018</b>	RunNo:	<b>124541</b>
Client ID:	<b>ZZZZZZ</b>	Batch ID:	<b>68342</b>	TestNo:	<b>EPA 200.8</b>			Analysis Date:	<b>6/7/2018</b>	SeqNo:	<b>3048822</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	10.212	0.50	10.00	0	102	75	125				
Arsenic	13.895	0.10	10.00	2.752	111	75	125				
Barium	30.314	1.0	10.00	18.61	117	75	125				
Copper	5.541	1.0	10.00	0	55.4	75	125				S
Lead	10.618	1.0	10.00	0	106	75	125				
Manganese	98.418	0.50	100.0	1.160	97.3	75	125				
Molybdenum	31.721	0.50	10.00	19.42	123	75	125				
Nickel	9.551	1.0	10.00	0	95.5	75	125				
Zinc	72.315	10	100.0	0	72.3	75	125				S

### Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference

Calculations are based on raw values



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"Serving Clients with Passion and Professionalism"

**CLIENT:** CH2M HILL  
**Work Order:** N030645  
**Project:** PG&E Topock, 680375.03.IM.OP.00

## ANALYTICAL QC SUMMARY REPORT

**TestCode:** 200.8\_W

Sample ID	<b>LCS-68342</b>	SampType:	<b>LCS</b>	TestCode:	<b>200.8_W</b>	Units:	<b>µg/L</b>	Prep Date:	<b>6/6/2018</b>	RunNo:	<b>124541</b>
Client ID:	<b>LCSW</b>	Batch ID:	<b>68342</b>	TestNo:	<b>EPA 200.8</b>			Analysis Date:	<b>6/7/2018</b>	SeqNo:	<b>3048829</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	9.539	0.50	10.00	0	95.4	85	115				
Arsenic	10.046	0.10	10.00	0	100	85	115				
Barium	10.252	1.0	10.00	0	103	85	115				
Copper	10.436	1.0	10.00	0	104	85	115				
Lead	9.811	1.0	10.00	0	98.1	85	115				
Manganese	98.972	0.50	100.0	0	99.0	85	115				
Molybdenum	9.784	0.50	10.00	0	97.8	85	115				
Nickel	10.639	1.0	10.00	0	106	85	115				
Zinc	91.690	10	100.0	0	91.7	85	115				

### Qualifiers:

- |    |   |   |                                      |   |  |
|----|---|---|--------------------------------------|---|--|
| B  | Analyte detected in the associated Method Blank | E | Value above quantitation range       | H | Holding times for preparation or analysis exceeded           |
| ND | Not Detected at the Reporting Limit             | R | RPD outside accepted recovery limits | S | Spike/Surrogate outside of limits due to matrix interference |

Calculations are based on raw values



**ASSET LABORATORIES**

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**ASSET Laboratories**
**ANALYTICAL RESULTS**
**Print Date:** 19-Jun-18

**CLIENT:** CH2M HILL  
**Lab Order:** N030645  
**Project:** PG&E Topock, 680375.03.IM.OP.00  
**Lab ID:** N030645-001

**Client Sample ID:** SC-100B-WDR-574  
**Collection Date:** 6/5/2018 2:38:00 PM  
**Matrix:** WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
<b>HEXAVALENT CHROMIUM BY IC</b>							
<b>EPA 218.6</b>							
RunID: <b>NV00922-IC7_180606A</b>	QC Batch: <b>R124465</b>			PrepDate		Analyst: <b>RAB</b>	
Hexavalent Chromium	470	3.3	20	µg/L	100	6/6/2018 10:24 AM	
<b>TOTAL METALS BY ICPMS</b>							
<b>EPA 200.8</b>							
RunID: <b>NV00922-ICP7_180607C</b>	QC Batch: <b>68342</b>			PrepDate	<b>6/6/2018</b>	Analyst: <b>CEI</b>	
Chromium	470	0.65	5.0	µg/L	5	6/7/2018 07:40 PM	

**Qualifiers:** B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 S Spike/Surrogate outside of limits due to matrix interference  
 DO Surrogate Diluted Out  
 E Value above quantitation range  
 ND Not Detected at the Reporting Limit  
 Results are wet unless otherwise specified



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**ASSET Laboratories**
**ANALYTICAL RESULTS**
**Print Date:** 19-Jun-18

**CLIENT:** CH2M HILL  
**Lab Order:** N030645  
**Project:** PG&E Topock, 680375.03.IM.OP.00  
**Lab ID:** N030645-002

**Client Sample ID:** SC-700B-WDR-574  
**Collection Date:** 6/5/2018 2:52:00 PM  
**Matrix:** WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**HEXAVALENT CHROMIUM BY IC**
**EPA 218.6**

RunID: <b>NV00922-IC7_180606A</b>	QC Batch: <b>R124465</b>				PrepDate		Analyst: <b>RAB</b>
Hexavalent Chromium	ND	0.033	0.20		µg/L	1	6/6/2018 10:52 AM

**TOTAL METALS BY ICPMS**
**EPA 200.8**

RunID: <b>NV00922-ICP7_180607C</b>	QC Batch: <b>68342</b>				PrepDate	<b>6/6/2018</b>	Analyst: <b>CEI</b>
Chromium	ND	0.13	1.0		µg/L	1	6/7/2018 07:45 PM

<b>Qualifiers:</b>	B	Analyte detected in the associated Method Blank	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
	DO	Surrogate Diluted Out		



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**CLIENT:** CH2M HILL  
**Work Order:** N030645  
**Project:** PG&E Topock, 680375.03.IM.OP.00

**ANALYTICAL QC SUMMARY REPORT****TestCode: 200.8\_W\_CRPGE**

Sample ID	MB-68342	SampType:	MBLK	TestCode:	200.8_W_CR	Units:	µg/L	Prep Date:	6/6/2018	RunNo:	124541		
Client ID:	PBW	Batch ID:	68342	TestNo:	EPA 200.8			Analysis Date:	6/7/2018	SeqNo:	3048901		
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium		ND		1.0									

Sample ID	N030627-001C-MS	SampType:	MS	TestCode:	200.8_W_CR	Units:	µg/L	Prep Date:	6/6/2018	RunNo:	124541		
Client ID:	ZZZZZZ	Batch ID:	68342	TestNo:	EPA 200.8			Analysis Date:	6/7/2018	SeqNo:	3048908		
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium		10.734		1.0	10.00	0.9096	98.2	75	125				

Sample ID	N030627-001C-MSD	SampType:	MSD	TestCode:	200.8_W_CR	Units:	µg/L	Prep Date:	6/6/2018	RunNo:	124541		
Client ID:	ZZZZZZ	Batch ID:	68342	TestNo:	EPA 200.8			Analysis Date:	6/7/2018	SeqNo:	3048910		
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium		10.629		1.0	10.00	0.9096	97.2	75	125	10.73	0.984	20	

Sample ID	N030646-006C-MS	SampType:	MS	TestCode:	200.8_W_CR	Units:	µg/L	Prep Date:	6/6/2018	RunNo:	124541		
Client ID:	ZZZZZZ	Batch ID:	68342	TestNo:	EPA 200.8			Analysis Date:	6/7/2018	SeqNo:	3048942		
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium		10.203		1.0	10.00	0.4053	98.0	75	125				

Sample ID	LCS-68342	SampType:	LCS	TestCode:	200.8_W_CR	Units:	µg/L	Prep Date:	6/6/2018	RunNo:	124541		
Client ID:	LCSW	Batch ID:	68342	TestNo:	EPA 200.8			Analysis Date:	6/7/2018	SeqNo:	3048949		
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium		10.084		1.0	10.00	0	101	85	115				

**Qualifiers:**

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference

Calculations are based on raw values



**ASSET LABORATORIES**  
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"Serving Clients with Passion and Professionalism"

**CLIENT:** CH2M HILL  
**Work Order:** N030645  
**Project:** PG&E Topock, 680375.03.IM.OP.00

## ANALYTICAL QC SUMMARY REPORT

**TestCode:** 218.6\_WU\_PGE

Sample ID	MB-R124465	SampType:	MBLK	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	124465			
Client ID:	PBW	Batch ID:	R124465	TestNo:	EPA 218.6			Analysis Date:	6/6/2018	SeqNo:	3046533			
Analyte		Result		PQL	SPK value	SPK Ref Val		%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Hexavalent Chromium ND 0.20

Sample ID	LCS-R124465	SampType:	LCS	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	124465			
Client ID:	LCSW	Batch ID:	R124465	TestNo:	EPA 218.6			Analysis Date:	6/6/2018	SeqNo:	3046534			
Analyte		Result		PQL	SPK value	SPK Ref Val		%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Hexavalent Chromium 5.187 0.20 5.000 0 104 90 110

Sample ID	N030645-001BMS	SampType:	MS	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	124465			
Client ID:	ZZZZZZ	Batch ID:	R124465	TestNo:	EPA 218.6			Analysis Date:	6/6/2018	SeqNo:	3046538			
Analyte		Result		PQL	SPK value	SPK Ref Val		%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Hexavalent Chromium 992.780 20 500.0 466.5 105 90 110

Sample ID	N030645-001BMSD	SampType: MSD	TestCode: 218.6_WU_P	Units: µg/L	Prep Date:	RunNo: 124465					
Client ID: ZZZZZZ	Batch ID: R124465	TestNo: EPA 218.6	Analysis Date: 6/6/2018	SeqNo: 3046539							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Hexavalent Chromium 997.170 20 500.0 466.5 106 90 110 992.8 0.441 20

Sample ID	N030645-002CMS	SampType:	MS	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	124465			
Client ID:	ZZZZZZ	Batch ID:	R124465	TestNo:	EPA 218.6			Analysis Date:	6/6/2018	SeqNo:	3046543			
Analyte		Result		PQL	SPK value	SPK Ref Val		%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Hexavalent Chromium 0.905 0.20 1.000 0 90.5 90 110

### Qualifiers:

- |    |   |   |                                      |   |  |
|----|---|---|--------------------------------------|---|--|
| B  | Analyte detected in the associated Method Blank | E | Value above quantitation range       | H | Holding times for preparation or analysis exceeded           |
| ND | Not Detected at the Reporting Limit             | R | RPD outside accepted recovery limits | S | Spike/Surrogate outside of limits due to matrix interference |
- Calculations are based on raw values



**ASSET LABORATORIES**  
ANALYTICAL SERVICES FOR THE CONSTRUCTION INDUSTRY

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EPA ID CA01638

NEVADA | P: 702.307.2659 F: 702.307.2691  
3151 W. Post Rd., Las Vegas, NV 89118  
ELAP Cert 2676 | NV Cert NV00922  
ORELAP/NELAP Cert 4046

"Serving Clients with Passion and Professionalism"

CLIENT: CH2M HILL  
Work Order: N030645  
Project: PG&E Topock, 680375.03.IM.OP.00

## ANALYTICAL QC SUMMARY REPORT

TestCode: 218.6\_WU\_PGE

Sample ID	N030637-002ADUP	SampType:	DUP	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	124465	
Client ID:	ZZZZZZ	Batch ID:	R124465	TestNo:	EPA 218.6			Analysis Date:	6/6/2018	SeqNo:	3046544	
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium		2.820	0.20						2.810	0.355	20	

### Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference

Calculations are based on raw values



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"Serving Clients with Passion and Professionalism"

# ASSET Laboratories

# ANALYTICAL RESULTS

Print Date: 19-Jun-18

CLIENT: CH2M HILL  
 Lab Order: N030645  
 Project: PG&E Topock, 680375.03.IM.OP.00  
 Lab ID: N030645-001

Client Sample ID: SC-100B-WDR-574  
 Collection Date: 6/5/2018 2:38:00 PM  
 Matrix: WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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## TURBIDITY

## SM 2130B

RunID: NV00922-WC_180606F	QC Batch: R124493	PrepDate	Analyst: LR
Turbidity	0.16 0.10 0.10	NTU	1 6/6/2018 01:50 PM

**Qualifiers:** B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 S Spike/Surrogate outside of limits due to matrix interference  
 DO Surrogate Diluted Out  
 E Value above quantitation range  
 ND Not Detected at the Reporting Limit  
 Results are wet unless otherwise specified



**ASSET LABORATORIES**  
 ANALYTICAL SUPPORT SERVICES FOR ENVIRONMENTAL TECHNOLOGIES

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# ASSET Laboratories

# ANALYTICAL RESULTS

Print Date: 19-Jun-18

CLIENT: CH2M HILL  
 Lab Order: N030645  
 Project: PG&E Topock, 680375.03.IM.OP.00  
 Lab ID: N030645-002

Client Sample ID: SC-700B-WDR-574  
 Collection Date: 6/5/2018 2:52:00 PM  
 Matrix: WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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## TURBIDITY

## SM 2130B

RunID: NV00922-WC_180606F	QC Batch: R124493	PrepDate	Analyst: LR
Turbidity	0.15 0.10 0.10	NTU	1 6/6/2018 01:50 PM

**Qualifiers:** B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 S Spike/Surrogate outside of limits due to matrix interference  
 DO Surrogate Diluted Out  
 E Value above quantitation range  
 ND Not Detected at the Reporting Limit  
 Results are wet unless otherwise specified



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**CLIENT:** CH2M HILL  
**Work Order:** N030645  
**Project:** PG&E Topock, 680375.03.IM.OP.00

**ANALYTICAL QC SUMMARY REPORT****TestCode: 2130\_W**

Sample ID	MB-R124493	SampType:	MBLK	TestCode:	2130_W	Units:	NTU	Prep Date:		RunNo:	124493		
Client ID:	PBW	Batch ID:	R124493	TestNo:	SM 2130B			Analysis Date:	6/6/2018	SeqNo:	3046056		
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Turbidity		ND		0.10									

Sample ID	N030645-002BDUP	SampType:	DUP	TestCode:	2130_W	Units:	NTU	Prep Date:		RunNo:	124493		
Client ID:	ZZZZZZ	Batch ID:	R124493	TestNo:	SM 2130B			Analysis Date:	6/6/2018	SeqNo:	3046059		
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Turbidity		0.130		0.10						0.1500	14.3	30	

Sample ID	N030646-004DDUP	SampType:	DUP	TestCode:	2130_W	Units:	NTU	Prep Date:		RunNo:	124493		
Client ID:	ZZZZZZ	Batch ID:	R124493	TestNo:	SM 2130B			Analysis Date:	6/6/2018	SeqNo:	3046065		
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Turbidity		2.410		0.10						2.390	0.833	30	

**Qualifiers:**

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference

Calculations are based on raw values

**ASSET LABORATORIES**

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**ASSET Laboratories**
**ANALYTICAL RESULTS**
**Print Date:** 19-Jun-18

**CLIENT:** CH2M HILL  
**Lab Order:** N030645  
**Project:** PG&E Topock, 680375.03.IM.OP.00  
**Lab ID:** N030645-002

**Client Sample ID:** SC-700B-WDR-574  
**Collection Date:** 6/5/2018 2:52:00 PM  
**Matrix:** WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**ANIONS BY ION CHROMATOGRAPHY**
**EPA 300.0**

RunID: NV00922-IC8_180607A	QC Batch: R124522				PrepDate		Analyst: RAB
Fluoride	2.4	0.013	0.20		mg/L	2	6/7/2018 12:52 PM

**ANIONS BY ION CHROMATOGRAPHY**
**EPA 300.0**

RunID: NV00922-IC8_180606A	QC Batch: R124518				PrepDate		Analyst: RAB
Sulfate	470	1.1	25		mg/L	50	6/6/2018 07:50 PM

<b>Qualifiers:</b>	B	Analyte detected in the associated Method Blank	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
	DO	Surrogate Diluted Out		



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**CLIENT:** CH2M HILL  
**Work Order:** N030645  
**Project:** PG&E Topock, 680375.03.IM.OP.00

**ANALYTICAL QC SUMMARY REPORT****TestCode: 300\_W\_FPG**

Sample ID <b>MB-R124522_F</b>	SampType: <b>MBLK</b>	TestCode: <b>300_W_FPG</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>124522</b>
Client ID: <b>PBW</b>	Batch ID: <b>R124522</b>	TestNo: <b>EPA 300.0</b>		Analysis Date: <b>6/7/2018</b>	SeqNo: <b>3047468</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Fluoride ND 0.10

Sample ID <b>LCS-R124522_F</b>	SampType: <b>LCS</b>	TestCode: <b>300_W_FPG</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>124522</b>
Client ID: <b>LCSW</b>	Batch ID: <b>R124522</b>	TestNo: <b>EPA 300.0</b>		Analysis Date: <b>6/7/2018</b>	SeqNo: <b>3047469</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Fluoride 1.259 0.10 1.250 0 101 90 110

Sample ID <b>N030627-001DMS</b>	SampType: <b>MS</b>	TestCode: <b>300_W_FPG</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>124522</b>
Client ID: <b>ZZZZZ</b>	Batch ID: <b>R124522</b>	TestNo: <b>EPA 300.0</b>		Analysis Date: <b>6/7/2018</b>	SeqNo: <b>3047478</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Fluoride 8.640 0.50 6.250 2.386 100 80 120

Sample ID <b>N030627-001DMSD</b>	SampType: <b>MSD</b>	TestCode: <b>300_W_FPG</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>124522</b>
Client ID: <b>ZZZZZ</b>	Batch ID: <b>R124522</b>	TestNo: <b>EPA 300.0</b>		Analysis Date: <b>6/7/2018</b>	SeqNo: <b>3047479</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Fluoride 8.674 0.50 6.250 2.386 101 80 120 8.640 0.399 20

Sample ID <b>N030646-005DMS</b>	SampType: <b>MS</b>	TestCode: <b>300_W_FPG</b>	Units: <b>mg/L</b>	Prep Date:	RunNo: <b>124522</b>
Client ID: <b>ZZZZZ</b>	Batch ID: <b>R124522</b>	TestNo: <b>EPA 300.0</b>		Analysis Date: <b>6/7/2018</b>	SeqNo: <b>3047483</b>
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual

Fluoride 9.487 0.50 6.250 3.412 97.2 80 120

**Qualifiers:**

B Analyte detected in the associated Method Blank E Value above quantitation range H Holding times for preparation or analysis exceeded  
 ND Not Detected at the Reporting Limit R RPD outside accepted recovery limits S Spike/Surrogate outside of limits due to matrix interference  
 Calculations are based on raw values



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"Serving Clients with Passion and Professionalism"



CLIENT: CH2M HILL  
Work Order: N030645  
Project: PG&E Topock, 680375.03.IM.OP.00

## ANALYTICAL QC SUMMARY REPORT

TestCode: 300\_W\_FPGE

Sample ID	N030646-003DDUP	SampType:	DUP	TestCode:	300_W_FPG	Units:	mg/L	Prep Date:		RunNo:	124522		
Client ID:	ZZZZZZ	Batch ID:	R124522	TestNo:	EPA 300.0			Analysis Date:	6/7/2018	SeqNo:	3047485		
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride		2.306		0.20						2.311	0.208	20	

### Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference

Calculations are based on raw values



ANALYTICAL SERVICES IN CALIFORNIA, NEVADA, AND ARIZONA

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"Serving Clients with Passion and Professionalism"

**CLIENT:** CH2M HILL  
**Work Order:** N030645  
**Project:** PG&E Topock, 680375.03.IM.OP.00

## ANALYTICAL QC SUMMARY REPORT

**TestCode:** 300\_W\_SO4PGE

Sample ID	<b>MB-R124518_SO4</b>	SampType:	<b>MBLK</b>	TestCode:	<b>300_W_SO4P</b>	Units:	<b>mg/L</b>	Prep Date:		RunNo:	<b>124518</b>
Client ID:	<b>PBW</b>	Batch ID:	<b>R124518</b>	TestNo:	<b>EPA 300.0</b>			Analysis Date:	<b>6/6/2018</b>	SeqNo:	<b>3047311</b>
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD RPDLimit Qual

Sulfate ND 0.50

Sample ID	<b>LCS-R124518_SO4</b>	SampType:	<b>LCS</b>	TestCode:	<b>300_W_SO4P</b>	Units:	<b>mg/L</b>	Prep Date:		RunNo:	<b>124518</b>
Client ID:	<b>LCSW</b>	Batch ID:	<b>R124518</b>	TestNo:	<b>EPA 300.0</b>			Analysis Date:	<b>6/6/2018</b>	SeqNo:	<b>3047312</b>
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD RPDLimit Qual

Sulfate 3.921 0.50 4.000 0 98.0 90 110

Sample ID	<b>N030638-005CMS</b>	SampType:	<b>MS</b>	TestCode:	<b>300_W_SO4P</b>	Units:	<b>mg/L</b>	Prep Date:		RunNo:	<b>124518</b>
Client ID:	<b>ZZZZZZ</b>	Batch ID:	<b>R124518</b>	TestNo:	<b>EPA 300.0</b>			Analysis Date:	<b>6/6/2018</b>	SeqNo:	<b>3047325</b>
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD RPDLimit Qual

Sulfate 108.575 5.0 40.00 69.38 98.0 80 120

Sample ID	<b>N030638-005CMSD</b>	SampType:	<b>MSD</b>	TestCode:	<b>300_W_SO4P</b>	Units:	<b>mg/L</b>	Prep Date:		RunNo:	<b>124518</b>
Client ID:	<b>ZZZZZZ</b>	Batch ID:	<b>R124518</b>	TestNo:	<b>EPA 300.0</b>			Analysis Date:	<b>6/6/2018</b>	SeqNo:	<b>3047326</b>
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD RPDLimit Qual

Sulfate 108.252 5.0 40.00 69.38 97.2 80 120 108.6 0.298 20

Sample ID	<b>N030651-003DMS</b>	SampType:	<b>MS</b>	TestCode:	<b>300_W_SO4P</b>	Units:	<b>mg/L</b>	Prep Date:		RunNo:	<b>124518</b>
Client ID:	<b>ZZZZZZ</b>	Batch ID:	<b>R124518</b>	TestNo:	<b>EPA 300.0</b>			Analysis Date:	<b>6/6/2018</b>	SeqNo:	<b>3047329</b>
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD RPDLimit Qual

Sulfate 32.528 1.0 8.000 24.41 102 80 120

### Qualifiers:

- |    |   |   |                                      |   |  |
|----|---|---|--------------------------------------|---|--|
| B  | Analyte detected in the associated Method Blank | E | Value above quantitation range       | H | Holding times for preparation or analysis exceeded           |
| ND | Not Detected at the Reporting Limit             | R | RPD outside accepted recovery limits | S | Spike/Surrogate outside of limits due to matrix interference |
- Calculations are based on raw values



**ASSET LABORATORIES**  
ANALYTICAL SERVICES PROVIDER FOR ENVIRONMENTAL TECHNOLOGIES

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"Serving Clients with Passion and Professionalism"

CLIENT: CH2M HILL  
Work Order: N030645  
Project: PG&E Topock, 680375.03.IM.OP.00

## ANALYTICAL QC SUMMARY REPORT

TestCode: 300\_W\_SO4PGE

Sample ID	N030638-003CDUP	SampType:	DUP	TestCode:	300_W_SO4P	Units:	mg/L	Prep Date:		RunNo:	124518		
Client ID:	ZZZZZZ	Batch ID:	R124518	TestNo:	EPA 300.0			Analysis Date:	6/6/2018	SeqNo:	3047331		
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate		19.038		1.0						19.11	0.357	20	

### Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference

Calculations are based on raw values



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**ASSET Laboratories**
**ANALYTICAL RESULTS**
**Print Date:** 19-Jun-18

**CLIENT:** CH2M HILL  
**Lab Order:** N030645  
**Project:** PG&E Topock, 680375.03.IM.OP.00  
**Lab ID:** N030645-002

**Client Sample ID:** SC-700B-WDR-574  
**Collection Date:** 6/5/2018 2:52:00 PM  
**Matrix:** WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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**NITRATE/NITRITE-N BY CADMIUM REDUCTION**
**SM4500-NO3F**

RunID: <b>NV00922-WC_180614C</b>	QC Batch: <b>R124644</b>			PrepDate			Analyst: <b>QBM</b>
Nitrate/Nitrite as N	2.7	0.16	0.25	mg/L	5		6/14/2018

**Qualifiers:** B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 S Spike/Surrogate outside of limits due to matrix interference  
 DO Surrogate Diluted Out  
 E Value above quantitation range  
 ND Not Detected at the Reporting Limit  
 Results are wet unless otherwise specified



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**CLIENT:** CH2M HILL  
**Work Order:** N030645  
**Project:** PG&E Topock, 680375.03.IM.OP.00

**ANALYTICAL QC SUMMARY REPORT****TestCode: 4500N03F\_W**

Sample ID	MB-R124644	SampType:	MBLK	TestCode:	4500N03F_W	Units:	mg/L	Prep Date:		RunNo:	124644		
Client ID:	PBW	Batch ID:	R124644	TestNo:	SM4500-NO3			Analysis Date:	6/14/2018	SeqNo:	3054460		
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate/Nitrite as N		ND		0.050									

Sample ID	LCS-R124644	SampType:	LCS	TestCode:	4500N03F_W	Units:	mg/L	Prep Date:		RunNo:	124644		
Client ID:	LCSW	Batch ID:	R124644	TestNo:	SM4500-NO3			Analysis Date:	6/14/2018	SeqNo:	3054461		
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate/Nitrite as N		0.466		0.050	0.5000	0	93.3	85	115				

Sample ID	N030627-003EDUP	SampType:	DUP	TestCode:	4500N03F_W	Units:	mg/L	Prep Date:		RunNo:	124644		
Client ID:	ZZZZZZ	Batch ID:	R124644	TestNo:	SM4500-NO3			Analysis Date:	6/14/2018	SeqNo:	3054465		
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate/Nitrite as N		2.506		0.25						2.791	10.8	20	

Sample ID	N030627-004EMS	SampType:	MS	TestCode:	4500N03F_W	Units:	mg/L	Prep Date:		RunNo:	124644		
Client ID:	ZZZZZZ	Batch ID:	R124644	TestNo:	SM4500-NO3			Analysis Date:	6/14/2018	SeqNo:	3054467		
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate/Nitrite as N		4.369		0.25	2.500	1.687	107	75	125				

Sample ID	N030627-004EMSD	SampType:	MSD	TestCode:	4500N03F_W	Units:	mg/L	Prep Date:		RunNo:	124644		
Client ID:	ZZZZZZ	Batch ID:	R124644	TestNo:	SM4500-NO3			Analysis Date:	6/14/2018	SeqNo:	3054468		
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate/Nitrite as N		4.365		0.25	2.500	1.687	107	75	125	4.368	0.0802	20	

**Qualifiers:**

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference

Calculations are based on raw values



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<b>Project Name</b> PG&E Topock <b>Location</b> PG&E Topock <b>Project Number</b> 680375.03.IM.OP.00 <b>Project Manager</b> Scott O'Donnell <b>Sample Manager</b> Shawn Duffy  <b>Task Order</b> <b>Project</b> IM3PLANT-ARAR-WDR-574 <b>Turnaround Time</b> 10 Days <b>Shipping Date:</b> <b>COC Number:</b> 574				<b>Container:</b> 1 Liter Poly <b>Preservatives:</b> 4°C Lab H2SO4 <b>Filtered:</b> NA <b>Holding Time:</b> 28	1 Liter Poly 4°C NA 7	1 Liter Poly 4°C NA 7	250 ml Poly 4°C NA 1	1 Liter Poly 4°C Lab H2SO4 NA 28	1 Liter Poly 4°C NA 7	500 ml Poly 4°C NA 180	500 ml Poly 4°C NA 180	1 Liter Poly 4°C NA 7	Number of Containers  COMMENTS
DATE TIME Matrix	AMMONIA (SM4500NH3D) Anions (E300.0) FI, SO4 CONDUCTIVITY (E120.1) E218.6 Lab Filtered Nitrate/Nitrite (SM4500NO3-E) TDS (SM2540C) Total Metals(E200.7 and E200.8) Total Metals(E200.8) Cr & Mn Turbidity (SM2130)												
SC-100B-WDR-574 06-05-18 1439 Water			X	X		X		X			N030645-01	3	
SC-700B-WDR-574 06-05-18 1452 Water	X	X	X	X	X	X	X		X		-02	4	
TOTAL NUMBER OF CONTAINERS											7		

<b>Signatures</b> <b>Date/Time</b>		<b>Shipping Details</b>		<b>ATTN:</b>  <b>Sample Custody</b> and <b>Marlon Cartin</b>	<b>Special Instructions:</b> SC-700B Total metals List: Cr,Al,Sb,As,Ba,B,Cu,Pb,Mn,Mo,Ni,Fe,Zn  Report Copy to Doug Scott (970) 731-0636
Approved by Sampled by Relinquished by Received by Relinquished by Received by	06-05-18 1315 06-05-18 1500 06-05-18 1545 6/5/18 15:45 6/5/18 17:45 6/5/18 17:45	Method of Shipment: <b>FedEx</b> On Ice: <input checked="" type="checkbox"/> yes <input type="checkbox"/> no Airbill No: 2.1°C IR#2 Lab Name: <b>ASSET Laboratories</b> Lab Phone: (702) 307-2659			

## ASSET Laboratories

Please review the checklist below. Any NO signifies non-compliance. Any non-compliance will be noted and must be understood as having an impact on the quality of the data. All tests will be performed as requested regardless of any compliance issues.

If you have any questions or further instruction, please contact our Project Coordinator at (702) 307-2659.

Cooler Received/Opened On: 6/5/2018 Workorder: N030645  
 Rep sample Temp (Deg C): 2.1 IR Gun ID: 2  
 Temp Blank: ☒ Yes ☐ No  
 Carrier name: ASSET  
 Last 4 digits of Tracking No.: NA Packing Material Used: None  
 Cooling process: ☒ Ice ☐ Ice Pack ☐ Dry Ice ☐ Other ☐ None

### Sample Receipt Checklist

1. Shipping container/cooler in good condition?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
2. Custody seals intact, signed, dated on shipping container/cooler?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
3. Custody seals intact on sample bottles?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
4. Chain of custody present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
5. Sampler's name present in COC?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
6. Chain of custody signed when relinquished and received?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
7. Chain of custody agrees with sample labels?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
8. Samples in proper container/bottle?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
9. Sample containers intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
10. Sufficient sample volume for indicated test?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
11. All samples received within holding time?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
12. Temperature of rep sample or Temp Blank within acceptable limit?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	NA <input type="checkbox"/>
13. Water - VOA vials have zero headspace?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	NA <input checked="" type="checkbox"/>
14. Water - pH acceptable upon receipt? Example: pH > 12 for (CN,S); pH<2 for Metals	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	NA <input type="checkbox"/>
15. Did the bottle labels indicate correct preservatives used?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	NA <input checked="" type="checkbox"/>
16. Were there Non-Conformance issues at login?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	NA <input type="checkbox"/>
Was Client notified?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	NA <input checked="" type="checkbox"/>

Comments: Samples for Hex Cr were lab filtered and preserved with Ammonium buffer.  
 Samples for Metals were lab preserved with HNO3 and for Ammonia/Nitrate/Nitrite with H2SO4.

For:

Checklist Completed By: DA



6/7/2018

Reviewed By:



LR 6/8/2018



## ASSET Laboratories

3151-3153 W Post Rd., Las Vegas, NV 89118

www.atl-labs.com

TEL: 7023072659

FAX: 7023072691

# CHAIN-OF-CUSTODY RECORD

Page 1 of 1

**QC Level: Level IV**

**Subcontractor:**

BC Labs  
4100 Atlas Court  
Bakersfield, CA 93308

TEL: (661) 327-4911  
FAX: (661) 327-1918  
Acct #:

Field Sampler: SIGNED

**06-Jun-18**


Sample ID	Matrix	Date Collected	Bottle Type	Requested Tests		
				SM4500-NH3D		
N030645-002A / SC-700B-WDR-574	Water	6/5/2018 2:52:00 PM	32OZP	1		

General Comments: Please email sample receipt acknowledgement to the PM.

Please use PO#:N30645A Please email Invoices and Account Receivable Statements to elvira@assetlaboratories.com. For questions, call Marlon at (702)-307-2659. Please e-mail results to reports.lv@assetlaboratories.com by: Normal TAT.

Please analyze for Ammonia by SM4500NH3D. EDD Requirement Labspec7 edata.

GSO #: 540858618

	<b>Date/Time</b>		<b>Date/Time</b>
Relinquished by: 	6/6/2018 17:00	Received by: _____	_____
Relinquished by: _____	_____	Received by: _____	_____



## List of Analysts

### ASSET Laboratories Work Order: N030645

NAME	TEST METHOD
Quennie Manimtim	SM 4500-NO3F
Claire Ignacio	EPA 200.7, EPA 200.8
Ria Abes	EPA 218.6, EPA 300.0
Lilia Ramit	EPA 120.1, SM 2540C, SM 2130B



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